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Ref: S.B. No. 873 – An Act Concerning Colon Hydrotherapy Services

Subject: Testimony of International Association for Colon Hydrotherapy
Public Health Committee Public Hearing February 20, 2013

Dear Senator Gerratana, Representative Johnson, and Members of the Public Health Committee:

The International Association for Colon Hydrotherapy (I-ACT) is pleased to see that the State of Connecticut is considering creating a public registry of the Colon Hydrotherapist that reside in the State of Connecticut who are certified by the National Board for Colon Hydrotherapy (NBCHT), and I submit this written testimony in support of S.B. No. 873.

I-ACT is a professional membership association established to provide guidelines and training for individuals providing colon hydrotherapy services, with over 2300 Members, including over 400 international members and 14 members in Connecticut. I-ACT advocates the highest standards of education and professional conduct to assure properly administered colon hydrotherapy. These professionals are well schooled and pass rigorous testing in the administering of colon hydrotherapy. Since 1989, I-ACT has offered educational programming and training to over 3500 professionals.

A copy of the I-ACT Colon Hydrotherapy Manual, 2nd Edition (draft), is attached hereto as Exhibit A, and a copy of the I-ACT Policy Statements is attached hereto as Exhibit B.

Colon hydrotherapy irrigates and cleanses the colon. It is an extended and more complete form of an enema utilizing gently infused warm, filtered water into the rectum which hydrates the colon, softens and loosens waste and results in evacuation through normal peristalsis. The pressure of the water during the session is very low, from 1/4 lb. to 2.0 lbs, resulting in the cleansing of the rectosigmoid area thru a series of fill and empty cycles.

The speculum/ rectal tube used in the service is only inserted approximately 2 inches into the rectum and the Colon Hydrotherapist is with the client during the hour it takes to complete a colon hydrotherapy session.

Colon hydrotherapy does not include the diagnosis of a specific pathology or acts of physical therapy or therapeutic or corrective measures.

Colon Hydrotherapists certified by I-ACT follow strict guidelines and are taught very specific procedures relating to the use of speculum/rectal tube and standard operating procedures to insure the dignity, privacy and safety of a client. Such training is taught by highly qualified Colon Hydrotherapy instructors, some of whom are located in the State of Connecticut.

A copy of I-ACT Standard Operating Procedures, Regulations and Guidelines for I-ACT Recognized Schools & I-ACT Recognized Colon Hydrotherapy Establishments is attached hereto as Exhibit C. Attached hereto as Exhibit D is a copy of I-ACT's Code of Ethics and Exhibit E is a copy of I-ACT's Zero Tolerance Policy.

I-ACT offers four separate levels of certification for Colon Hydrotherapists: Foundation Level (Level 1), Intermediate Level (Level 2), Advanced Level (Level 3) and Instructor Level (Level 4).

Foundation Level (Level 1)

o Prerequisites:

- Must have a high school diploma/GED, or equivalent (prior to entering training)
- Must have postsecondary education level/college level A&P (equivalent to 3 semester hours of college) (before certification)
- Must have a current CPR card (before certification)

o Requirements:

- Either provide proof (by transcript) of completing a 100 hour (in the classroom) course of colon hydrotherapy training from an I-ACT approved School and/or an I-ACT Certified Instructor, or proof of a minimum of one year of practice with documentation of at least 100 colon hydrotherapy sessions (in the last year)
- Must be a full I-ACT Member in good standing
- Must send resume and proof of all related education; Seminars completed, degrees and experience in both practice and theory
- Must send pictures of facility showing: at a minimum, the waiting area, the colon hydrotherapy room (which has a picture of the equipment), and the bathroom, etc.
- Must send a blank copy of Health Questionnaire (Intake Form)
- Must carry Liability Insurance (if desired)/provide a copy of the policy front page (or a statement saying you do not wish to carry insurance)
- Must take and pass the I-ACT Foundation Level 2 Exam.

A copy of the Foundation Level Syllabus for use by I-ACT Recognized Schools and/or I-ACT Recognized Instructors is attached hereto as Exhibit F.

The Intermediate Level (Level 2)

o Prerequisites (must be completed before training):

- Must have a high school diploma/GED, or equivalent
- Must have postsecondary education level/college level A&P (equivalent to 3 semester hours of college)
- Must have a current CPR card
- Individual may not enter training for the Intermediate Level (Level 2) until they have been fully certified by I-ACT at the Foundation Level (Level 1) for a minimum of 6 months (however, an option for licensed healthcare providers is described below)

o Requirements:

- Must be certified, by I-ACT, at the Foundation Level for a minimum of six (6) months
- Licensed Medical Healthcare providers may take the Level 2 exam upon showing proof they have received at least 500 hours of in classroom training, or have two years working on the public under the scope of practice of their license
- Share for 30 minutes, choose A, B, or C:
- A: Take us on a video journey with your client as you teach them how they may assist themselves during a session
- B: Read your essay of 3000 words in personal experience
- C: Demonstrate the expertise you have developed through your work in Colon Hydrotherapy
- Must take and pass the I-ACT Intermediate Level 2 Exam.

A copy of the Intermediate Level Syllabus for use by I-ACT Recognized Schools and/or I-ACT Recognized Instructors is attached hereto as Exhibit G.

The Advanced Level (Level 3)

- o Prerequisites (must be completed before training)
 - Must have a high school diploma/GED, or equivalent
 - Must have postsecondary education level/college level A&P (equivalent to 3 semester hours of college)
 - Must have a current CPR card
 - Individual may not enter training for the Advanced Level (Level 3) until they have been fully certified by I-ACT at the Intermediate Level (Level 2) for a minimum of 1 year (however an option for licensed healthcare providers is described below)
- o Requirements:
 - Must be certified by I-ACT at the Intermediate Level for a minimum of 1 year, and must be a full member of I-ACT
 - Licensed Medical Healthcare providers may take the Level 3 exam upon showing proof they have received at least 1000 hours of in classroom training, or have three years of experience working on the public under the scope of practice of their license
 - Must take and pass the I-ACT Advanced Level 3 Exam.

A copy of the Advanced Level Syllabus for use by I-ACT Recognized Schools and/or I-ACT Recognized Instructors is attached hereto as Exhibit H.

Instructor Level (Level 4)

- o Prerequisites (must be completed before training):
 - Must have a high school diploma/GED, or equivalent
 - Must have postsecondary education level/college level A&P (equivalent to 3 semester hours of college)
 - Must have a current CPR card
 - Individual may not enter training for the Instructor Level (Level 4) until they have been fully certified by I-ACT at the Advanced Level
 - Each Instructor candidate must attend an Instructor training class put on by an I-ACT Instructor or an I-ACT School
- o Requirements:
 - Must be certified, by I-ACT, at the Advanced Level and be a Full I-ACT Member
 - Must attend a mandatory 60 hour (in the classroom) instructor training course provided by an I-ACT School or I-ACT Instructor
 - Demonstrate 3 hours of teaching on Foundation or Intermediate Level Anatomy & Physiology at an I-ACT recognized school or with an I-ACT instructor during a recognized I-ACT Instructor Course
 - Must demonstrate one hour of teaching at an I-ACT Convention - eight people in attendance desired
 - Submit outline of teaching and complete presentation to the I-ACT office prior to the convention (no later than April 30 of each year)
 - Write a test of 50 questions on Colon Hydrotherapy Anatomy & Physiology -multiple choice (A, B, C, & D)- with answers (provide correct answer on separate pages and also provide source documentation for each question). The source documents must be college level A&P Manuals, Gray's Anatomy, or the CIBA Collection - Digestive System (for example - NOT study guides) - Submit this test to I-ACT
 - Student will bring to the Convention the textbooks, class handouts, enrollment application, enrollment agreement, A&P review exam, evaluation forms, lesson plans, schedule, and the certificate of training completion that they will be using in their class
 - Must be NBCHT certified
 - Sign the Instructor Oath.

A copy of the Instructor Level Syllabus for use by I-ACT Recognized Schools and/or I-ACT Recognized Instructors is attached hereto as Exhibit I.

Thank you for the opportunity to provide this information. If we can answer any additional questions about the I-ACT's certification process, please contact our Executive Director, A. R. "Dick" Hoenninger at 210-366-2888 or contact I-ACT Board Member and Connecticut resident, Beverley Blass at 860-680-4151.

Sincerely,



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8 Exhibits:

- A) I-ACT Colon Hydrotherapy Manual, 2nd Edition (draft)
- B) I-ACT Policy Statements
- C) I-ACT Standard Operating Procedures, Regulations and Guidelines
- D) I-ACT's Code of Ethics
- E) I-ACT's Zero Tolerance Policy
- F) I-ACT's Foundation Level Syllabi
- G) I-ACT's Intermediate Level Syllabi
- H) I-ACT's Advanced Level Syllabi
- I) I-ACT's Instructor Level Syllabi

Colon Hydrotherapy

Manual

2nd Edition



Disclaimer:

Nothing in this manual is meant to diagnose, prescribe or respond to any medical condition.
For any medical condition, please refer to your physician or health care provider.

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I- ACT COLON

Introduction

This document has been enthusiastically created from the hard work of the members of your Board and the concerned colon hydrotherapists that are seeking to have information on the profession of colon hydrotherapy in one location.

The information found in this document is not intended to treat any condition or to make any claims for benefits of any health modality. You should always consult your health care provider prior to seeking any alternative health treatment.

Throughout this document, there are references to FDA registered manufacturers of colon hydrotherapy equipment; should you reside outside of the USA, then we recommend you comply with the guidelines of the governmental agency that would regulate your health care equipment. In addition, ensure that you are in complete compliance with all of the laws for your city, municipality, county, state, country or region.

I- ACT COLON

HISTORY OF COLON HYDROTHERAPY

[During the research for this chapter, many documents were used; however, there were three historical documents which provided the majority of the information. These historians are: first, W. Kerr Russell, M.D., B.S., author of *Colonic Irrigation* - published by William Wood & Company in 1932. Second, William W. Lieberman, M.D., author of *The Enema* - published in the *Review of Gastroenterology* Volume 13, Number 3, May-June, 1946. And, Julius Friedenwald and Samuel Morrison authored *The History of the Enema with Some Related Notes (Part 1 and Part 2)*, published in the *Bulletin Of The History Of Medicine*, Volume VII, Number 2, February, 1940.]

Early in the 20th century, there was much work done by numerous authors delineating the history of the enema and colon hydrotherapy. In this chapter we intend to recapitulate this information in a chronological manner.

It is difficult to identify the exact time in history that colon hydrotherapy emerged, but many historians trace it back to the ancient Egyptians. The historians tell us that the practice of Colon Hydrotherapy; or, in its most basic form, the enema was passed down from the Gods to the Egyptians. Dr. Otto Bettman describes the occasion:

“Thoth himself had revealed the enema one day to a few priest-physicians who were standing on the banks of the Nile. The god of medicine and science had landed on the water in the form of a sacred ibis. Filling his beak with water, he had injected it into his anus. The doctors took the hint, and the result was a great boon to humanity, the Devine Clyster.”^{1,2}



Picture from *History of the Enema*, pg 69

There are numerous reports of the frequent use of the enema by the Egyptians, with all of them referencing a papyrus of the 14th century B.C., that is stored in the Royal Museum of Berlin. Descriptions of various methods of preparing enemas are found in the Ebers Papyrus, of the 14th century B.C. This document was obtained in 1873 by Georg Ebers, and dates from the XVIIIth Dynasty (about 1500 B.C.). Directions for the use of the enema (or clyster), and remedies for over 20 stomach and intestinal complaints “to drive out excrements” are mentioned.^{3, 4, 5, 6}

According to William Lieberman, M.D. verification of the frequent use of the enema by the Egyptians came from Herodotus (484-425 B.C.) In the 5th Century B.C., Herodotus wrote: "The Egyptians clear themselves on three consecutive days, every month, seeking after health by emetics and enemas for they think that all disease comes to man from his food."^{7,8}

Use of the enema was not limited just to the Egyptians. Information on the use of enemas was recorded on the cuneiform inscriptions on Babylonian and Assyrian tablets, as early as 600 B.C., and there are references recorded in Hindu medical texts such as the *Susruta Samhita*, the work of Susruta, the father of Hindu surgery. Susruta describes the use of "syringes and bougies as well as a rectal speculum."^{9, 10}

The Greeks and Romans also contributed to the history of the enema. First, Hippocrates (4th and 5th century B.C.) the well know Greek physician, recorded using enemas for fever therapy, and disorders of the regime in his “*On Regimen in Acute Disease*”.^{11, 12} Then the Roman physician, Asclepiades of Bithynia {124 B.C.} (who is credited with establishing medicine in Rome) preferred the enema (clyster) over the use of laxatives. Asclepiades used the enema for intestinal worms and fevers.^{13, 14}

Chronologically, the next written report on the use of the enema comes from Celsus (30 A.D.) the author of *de Medicina*, one of the first medical books. Celsus is credited as being one of the first authors to write about the use of the enema. Celsus wrote, "This remedy should not be too often repeated, nor should it be too hot or cold."^{15, 16, 17}

There are depictions of clysters in the pre-Columbian Mayan art, for example, the "Castillo Bowl" from the Tikal area show has a "remarkable scene of crazed dancers... one grasps an enema clyster".¹⁸

The Greek physician Galen (2nd century A.D.), one of the most skilled physicians of his time, was also a proponent of the use of enemas. Unlike Aetius, a Greek physician of the sixth century, who rec-



A Pictorial History of
Medicine,²¹

ommended enemas of pure water, Galen recommended enemas of various types, including the use of oil and honey.^{19,20} Galen is depicted in this picture from a Galen Manuscript.

The Essene Gospel of the third century stated, "The uncleanness within is greater than the uncleanness without. And he who cleanses himself without, but within remains unclean, is like a tomb that outwardly is painted fair, but is within full of all manner of horrible uncleanness and abominations."²²

The enema was also a favorite mode of treatment for Nigerians and the early African races. It is reported that along the Ivory Coast the inhabitants administer the enemas by the use of a calabash filled with water, while in certain African tribes, a hollowed cow horn was utilized for the enema.²³



Calabash from History
of Enema

In fact, throughout history, there is an abundance of writings and pictures of the varying procedures for the administering of enemas or clysters, from the use of crude hollow reeds, to the calabash, and to clysters made from animal organs and animal parts such as bladders made from ox skin. Eventually, the apparatus for administering the enema evolved.

The first recorded apparatus was the enema syringe; however, there is debate as to who should be credited with first describing the enema syringe.

Lieberman gives credit to Avicenna ("Prince of Physicians") (980 - 1036 A.D.) as the first to describe the enema syringe²⁴, while Friedenwald indicates that honor should be given to Albucasis of Corboba (1013 - 1106) who also developed the ear syringe and wrote the "Rectification of Health".

Cordoba is quoted as stating, "You may also introduce into the clyster tube, a specially constructed piston, the end of which is armed with cotton. Then fill the tube with oil or other fluid, introduce into one end of the piston armed with cotton and push it onward until the liquid enters the ear."²⁵

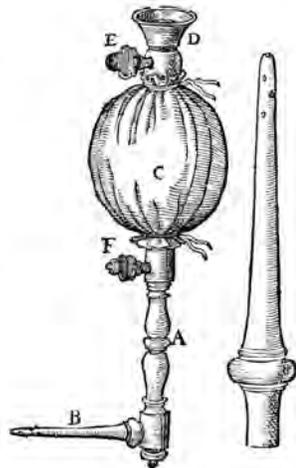
The use of the clyster continued to grow, and by the time of the famous English surgeon, John Ardene (1307 - 1390) the clyster was used "extensively in England by women of that day". Ardene wrote a treatise on clysters entitled, "Treatise of Fistula-in-ano, Hemorrhoids and Clysters" wherein he renounced the use of complicated concoctions in enemas since he concluded that in most cases those concoctions left the patient more constipated than before. Ardene recommended that each person, constipated or not, should be purged three to four times a year to maintain good health.^{26,27}

From the Eleventh Century to the Fifteenth Century, the early enema syringe was still relatively unknown and not available to the masses. The preferred and most readily available apparatus remained a tube made of bone, reed, or metal connected to a sleeve or bladder made of an animal bladder, hide, or silk cloth called the "clyster purse". The bag was emptied by squeezing it between the two hands. Dr. Russell reports that in Spain, the method was called "playing the bagpipes".²⁸

During the middle ages, information on the enema continued to grow and the use of the enema became the popular vogue of the wealthy and even reached to the highest levels of the royalty. With this growth in popularity, the evolution of the apparatus had to follow.

In 1480, Louis XI suffered an attack of apoplexy which was relieved by an enema, tendered under the direction of his physician, Angelo Catho. "The king became such an ardent advocate of clysters, that he even had his pet dogs clysterized when he thought they required it".^{29,30,31}

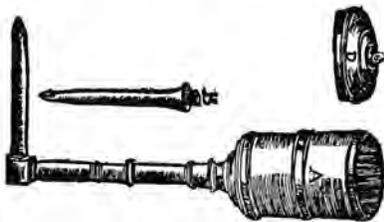
One of the first pieces of equipment that is recorded is the clyster apparatus developed by Fabricius Hildanus. In addition to the common bladder concept, he employed stopcocks to control the fluid in the bladder or purse with the additional benefit of allowing the addition of more fluid during the procedure.^{32,33}



Clyster apparatus of Fabricius Hildanus, showing clyster purse with double stopcock^{32,33}

The next recorded innovation came from Ambroise Pare (1510-1590). His apparatus also had a rigid tube, but this device was designed for self administration. Note Pare's description above the figure.^{34,35}

The figure of a Glyster pipe and Syringe, by benefit whereof a man may give himselfe a Glyster.



Original Picture^{34,35} from Thomas Johnson, 1984

The 17th Century became known as the “age of the enema”, or the “age of clysters”. It was the fashion in Parisian society to enjoy as many as three or four enemas a day, the popular belief being that an internal washing or “lavement” was essential to well-being. It was this acceptance by the public that took the enema or clyster from the hands of an apothecary into the hands of the public.

By this time, the clyster syringes came in several styles. The clyster syringes were made of copper or porcelain, and, the wealthy had syringes made of mother of pearl and silver. It was considered good form to own several syringes and some aristocrats, it is said, even owned large collections of such instruments.^{36,37,38}

In spite of the surge in popularity, the real growth of the enema or clyster did not come until the

apparatus could be self operated. Even though there were attempts to allow self operation, as in the device designed by Pare, in most cases an attendant was required. Regnier de Graaf, who is credited with the first description of the Graafian follicle, was unhappy with the clysters available at the time, as in many cases it required both hands to operate the syringe or to squeeze the clyster bag. In an effort to find a resolution to this perceived problem, he set about to design his own equipment. He desired a flexible tube of 5-6 feet that could be



Title page of de Graaf's book^{39, 40}

attached to a canula so the patient could administer the enema himself. Without the availability of rubber tubing, de Graf finally "prepared a tube from a thin strip of leather cut to fashion rolled in a cylindrical form, seared firmly together and finally waxed to avoid leakage. The entire tube was finally encased in a covering of black silk. A conical wooden shaped canula is at. To the other end, a wooden funnel is attached into which the enema syringe is made to fit snugly."^{41, 42,43}

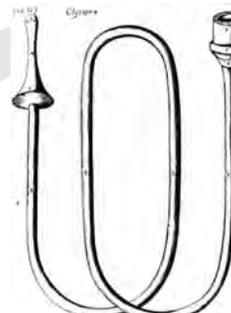


FIG. 2.—De Graaf's Clyster Apparatus (From a drawing made in 1701.)

De Graaf described the proper method to use the clyster syringe in his treatise *De Clysteribus* published in 1668. In this manuscript he classifies clysters as purgative, astringent, ano-



Picture from A Pictorial History of Medicine⁴⁰

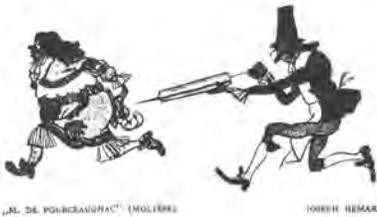
dyne, emollient, deterrent and diversant, and mentions nutrient enemas of wine, milk and yolks of eggs.^{44, 45}

The clyster reached the ultimate height of its fashionableness in the early years of the reign of Louis XIV (1638 - 1715) who, it is reported had over 2,000 enemas during his career. The King sometimes even receiving court functionaries and visitors during the procedure. A picture of the wood cuttings still exist showing the enemas being given during court functions.^{47, 48, 49}



Apothecary Sign from 15th Century⁴⁶

At this time, and probably in response to the excessive use of the enema, the procedure became the subject of many comedies, poems, satires, and plays; in particularly the plays of Moliere brought this subject the most intense notoriety. Moliere's play "Le Malade Imaginaire", "accomplished much in making it a fashionable procedure".⁵¹



From Cornelius Veth, Der Arst in der Karikatur⁵⁰

By the middle of the 18th Century, the widespread clyster usage had vanished, and a much saner approach to this therapeutic technique became manifest. The introduction of rubber made it possible to utilize this material to construct apparatus for enemas. Proponents of the clyster or enema continued to improve the apparatus.

One such proponent was Edward Jukes. He developed two types of enema apparatus that might be traced back as the precursor to the types of colon hydrotherapy equipment available today. According to Friedenwald and Morrison, first, Jukes

developed a form of gravity enema called the "flexible clysmaduct", the pressure was gravity fed as the clysmaduct had a ring to hang it from a wall. The higher the nail, the greater the gravity pressure.⁵²



Fig. 18. (From Edward Jukes, On indigestion and constipation; or the important, safe and efficacious means of relieving diseases of the digestive system by lavements, London, 1831, p. 86)

The second type of enema apparatus was a pressure fed type of enema which he designated the improved "syringe". The pressure of this equipment was determined by how fast the syringe pump was "pumped". Even with the improvements to the enema apparatus, there still was no consistent form of the enema.⁵³



Fig. 19. Jukes' Apparatus for Lavements. (From Jukes, op. cit., p. 81)

The issue of inconsistent standards was finally resolved by Vincent Priessnitz, who is the individual credited with developing the use of the enema and the clyster into a systematic form of therapy. "His treatise was translated into various languages and many physicians enthusiastically followed his method of treatment to a greater or lesser degree."⁵⁴

During the late 19th century and early 20th century, the use of colon hydrotherapy, and enemas slowly dwindled among the medical community as laxatives and other drugs became more commercially available.

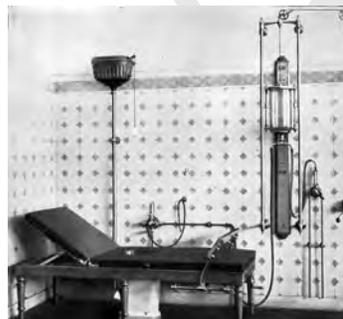
The therapy was rejuvenated in the United States by Dr. Kellogg. In addition to proper nutrition, he was a huge proponent of the enema in the treatment of many diseases. Dr. Kellogg reported in the 1917 Journal of American Medicine, "that in all but twenty cases, he had used no surgery for the treatment of gastrointestinal disease in his

patients..." The interesting fact is that Dr. Kellogg had more than 40,000 cases of gastrointestinal disease. That works out to be surgery on only 1 case in 2,000.⁵⁵

Throughout this period, the apparatus continued to evolve, and finally in 1932, W. Kerr Russell, M.D., B.S., wrote a book entitled Colonic Irrigation. This was the first documented use of the term colonic irrigation. He also used the term colonic irrigation synonymously with the term colonic lavage.

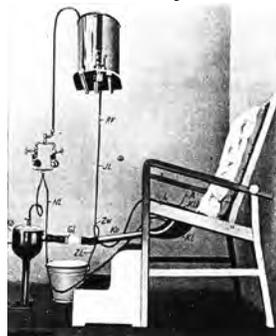
Dr. Russell tracked the evolution of the apparatus for colonic lavage from the earlier syringes, clysters, and enemas to the colonic apparatus of his time. He describes the distinction; "The term irrigation describes more accurately than the words clyster or enema the treatment which is administered with the modern apparatus. These methods lavage and thoroughly cleanse the walls, remove abnormal mucus, and also empty the bowel. The tone of the colonic muscle is improved and the blood supply augmented."⁵⁶

Tracking the evolution of colonic, or colonic irrigation equipment, one of the original pieces of equipment was the Plombières by De Langenhagen.⁵⁷ This apparatus was first introduced in 1898 and allowed the client to receive the procedure in a reclined position. The pressure and the rate of flow were both adjustable.



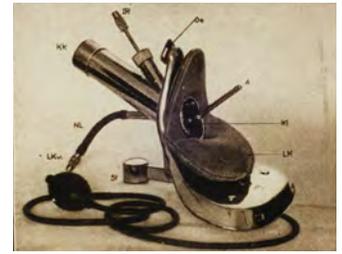
The Plombières "Douche Horizontale" ⁵⁸

The Studa Chair, shown here was developed by the same manufacturer that developed the Subaqueous Intestinal Bath Apparatus. At its time, Russell described this as the "most elaborate apparatus for colonic irri-

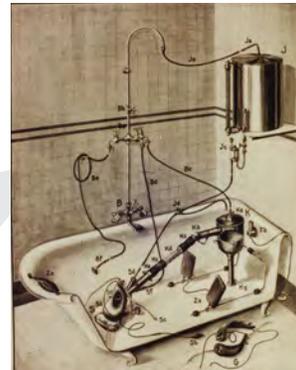


The Studa Chair Apparatus ⁵⁹

gation which is available." In Europe, the colonic is carried out in a large bath, in a well-ventilated treatment room, while in the United States, a "special trapped connection with the soil tank is required." There is a special saddle that is



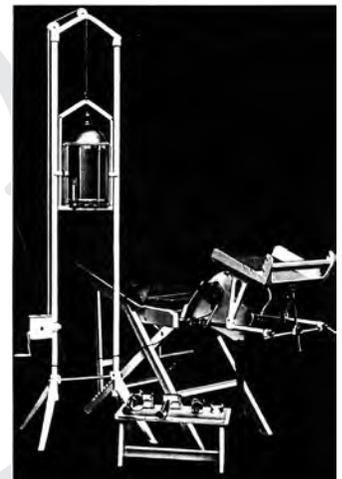
The Saddle ^{60, 61}



The Subaqueous Intestinal Bath ⁶²

fitted to the clients buttocks with the irrigation tube. This saddle is then connected to the water supply, and the waste pipe, which prevents contamination with the bath water. Russell points out that the saddle and the rectal catheter are lower than the fecal container requiring the fecal material to be forced upwards by the contraction of the muscles producing defecation.

Another interesting type of colonic apparatus in vogue at this time was the Borosini Gymnacoln Apparatus. With this piece of equipment, the client is lying on their back with the legs a right angle to the torso and the knees also bent at right angle. As with other equipment at the time, the tank level is adjusted to vary the gravity pressure of the water during the session.



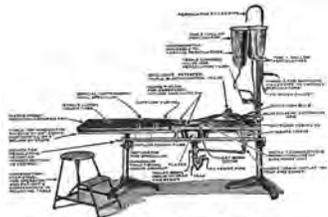
The Gymnacoln Apparatus ⁶³

Dr. Russell finishes his description of colonic apparatus (circa 1932) with a description and picture of the Vattenborg Irrigator. It is at this point that the pictorial history of the colonic irrigation apparatus is continued by James W. Wiltzie, M.D. in his 1938 book "Chronic Intestinal Toxemia and its Treatment" and then followed by Joseph E.



The Vattenborg Apparatus 64, 65, 66

G. Waddington, M.D., C.M. in his book "Scientific Intestinal Irrigation and Adjuvant Therapy," published in 1940. Since all three of these historians provide a picture of that apparatus, we'll use the best picture available which is from Dr. Waddington. In most cases, the Vattenborg apparatus was used in conjunction with the Morse Colonic Therapy Table which incorporates an adjustable section that can be raised to 20 degrees above horizontal and lowered (if required) to 5 degrees below



The Morse Colonic Therapy Table, Combining the Vattenborg Colonic Irrigator 68



The Morse Colonic Therapy Table 67

level. In the fixed section of the table top there is a toilet seat with a metal toilet bowl beneath the seat that is connected to the sewer. Both the bowl and the drain have city water connections for easy flushing. The client uses a step stool to mount the equipment.

Continuing to review the colonic apparatus



Equipment Type and Source Unknown



of the time, we are including three pictures that, unfortunately, we cannot give credit to the source. First are pictures of a unit similar in design and function to the Gymnacolon. Note, it appears that the water tank is adjustable and the position of the client once again can be changed to facilitate the

procedure.

The third picture, from an unknown source, has some identification on the labeling on the top which indicate it probably comes from a source in Germany. This equipment also allows the client to move through a range of motion and incorporates an adjustable water tank.



Equipment Type and Source Unknown



Honsaker Lavagatory 69

Continuing to build a bridge from the past to the present, we turn to the Honsaker Lavagatory. Dr. Waddington described this equipment as having, "A graduated volume control for regulating the rate of flow into the patient's rectum, and a directional control for diverting the fluid from the reservoir into the colon and from the colon into the toilet bowl,..."

This equipment also uses rubber, instead of metal for contacting the patient. The reason given is that rubber was chosen as it, "is flexible, sterilizable, light in weight and therefore produces little or no traction on the rectum; being a poor conductor of heat, rubber is neither too hot nor too cold when inserted into the anal canal."⁶⁹

There are perhaps two types of equipment that foretell the future of our current colon hydrotherapy equipment. The first of these is the Kennison Hydrotone which may be one of the first "open systems". The Kenni-



Kennison Hydrotone 70

son Hydrotone had an "all-metal table with built-in hot and cold water controls and a drain bowl, all sanitarily connected to the plumbing system. With the operator sitting at the side of the table, all the various controls are within easy reach... The irrigator applicator is made of stainless steel and permits inflow and outflow. This double-flow feature makes possible continuous irrigation without added pressure being applied."⁷⁰

Next, we turn to the Dierker Apparatus which symbolized one of the original "closed sys-



tems". This came in two styles, a therapeutic model and a standard model. Waddington describes the Dierker equipment thusly: "The Dierker apparatus consists of a glass percolator and all the necessary plumbing attachments, control valves, and special irrigation features compactly assembled into a stainless alloy frame. It may be attached to the usual type of treatment table or stand. The apparatus may be operated with or without vacuum, as a continuous in and out flow: or an intestinal massage may be administered resulting from the alternate expansion by a mild degree of gravity pressure, and contraction by a mild degree of vacuum, or negative pressure. This has the effect of promoting physiological peristalsis, and of working free the contents of the "pockets" and diverticula."⁷¹

In addition to all of the various types of equipment, there was also a variety of methods of performing the colonic. Snyder and Fineman identified the distinction between a "low" and "high" irrigation. A low irrigation, now called a colonic,

means the rectal tube {speculum} is inserted only 3-4 inches into the rectum; while in the "high" irrigation or high colonic, a 54 inch or longer tube is inserted into the colon.⁷² In the "low colonic" the water enters the rectum and slowly softens the fecal material from the rectum thru the sigmoid into the descending, transverse and ascending parts of the colon, while in the high colonic, the tube is inserted "high" up into the colon and then the water attempts to flush the fecal material from the ascending colon to the rectum.

From the 1940s, colon hydrotherapy equipment continued to evolve, and by the early 1950s, colon hydrotherapy was flourishing in the U.S. The prestigious Beverly Boulevard in California was then known as colonic row. However, towards the mid-1960s the use of colon irrigations and colon hydrotherapy slowly dwindled until approximately 1972 when most colon hydrotherapy instruments were removed from the hospitals and nursing homes as the more favored medical procedure, the colostomy, and prescriptive laxatives became the vogue.

In spite of these "in vogue" medical procedures, a few doctors continued to recommend colon hydrotherapy. The profession continued to grow and the colonic equipment continued its evolution. From 1930 to 1970, there were no less than 16 separate applications for patents for colon hydrotherapy equipment registered with the US Patent office.

Of the numerous patents that were granted, there were two applicants for patents that distinctly continued the evolution of the current "state of the art" equipment.

Alice Touchberry, from Palm Beach, FL, received patents in 1950, 1951, and 1968 for apparatus that enhanced the evolution of the current "open" systems. The current "closed" systems can be traced through a 1980 patent granted to George Holt of Scottsdale, AZ. This equipment was originally designed in 1978 as the Electrotox.

This dramatic increase in the types and styles of colon hydrotherapy equipment resulted in an acknowledgement that there was a need to ensure the safety of the public by establishing policies for the manufacturing of colonic equipment. At this point, the US Government strengthened the power of the FDA in an attempt to regulate the safety and effectiveness of colon hydrotherapy equipment. This resulted in the enactment of the Medical Device Amendments of 1976, which revised and extended the device requirements of the 1938 Federal Food, Drug, and Cosmetic Act. This Act was subsequently amended by the Safe Medical Devices Act of 1990 (SMDA) and the Medical Device Amendments of 1992. These amendments enhance premarket and postmarket controls and provide for additional regulatory authority over equipment manufactured for colon hydrotherapy.

As a result of the 1976 Medical Device Amendments Act, the FDA required each manufacturer of colon hydrotherapy equipment marked in the USA to be registered with the FDA. Additionally these manufacturers must obtain a 510k "approval to market" letter from the FDA to market colon hydrotherapy equipment for sale in the USA.

We'll trace the manufacturers that have registered with the FDA in a chronological order. First is Colon Therapeutics Research, Inc, the manufacturer of the Jimmy John, an "open system".

Second, is Dotolo Research Corporation which markets the Toxygen, a "closed system". The Toxygen was originally designed by George Holt (Colonics Diversified, Scottsdale, AZ). Dotolo Research Corporation purchased Colonics Diversified in 1984 from George Holt. The Toxygen, a compact system, allowed for precise temperature and pressure control without the need for bulky reservoir tanks to hold the water. Also in 1984, Dotolo introduced the first disposable speculum pack to eliminate any possibility of client contamination.

The third unit registered was the HydroSan from Specialty Health of Phoenix, Arizona. This unit was designed as a modular stackable unit with the electricity isolated from the module carrying the water. This unit introduced a specimen collection system.

The fourth system, registered with the FDA in 1994), was the LIBBE, an "open system" from Tiller, MIND BODY, Inc.

The fifth piece of equipment (registered in 1996), was another "closed system" from Clearwater Colon Hydrotherapy, Inc. the Traveler. The Traveler traces its roots to the Electrotox originally registered with the FDA prior to 1977.

Next, the sixth unit was from Transcom Transcendencias Comerciales, S.L. of Spain, the first manufacturer of colon hydrotherapy equipment from outside the USA, manufactured the HC 2000 (a "closed system"). This equipment was registered in 1997.

The seventh colon hydrotherapy equipment registered with the FDA was also from an international manufacturer, Prime Pacific Health Innovations Corporation. This equipment, the Aquanet Model EC2000 (a "closed system"), was registered in 2001.

Finally, in 2002, Lifestream Purification Systems, LLC registered the Angel of Water equipment, an "open system".

All manufacturers of FDA registered equipment must use disposable speculums or rectal nozzles to ensure public safety.

Having traced the evolution of colon hydrotherapy equipment, we'll turn to the evolution of the International Association of Colon Hydrotherapy (I-ACT).

Originally, I-ACT was founded as ACTA, the American Colon Therapy Association. It was

founded on December 21, 1989 and originally incorporated in Talladega County, Alabama. Connie Allred reports, "The organization was formed over the phone through a conference call with six tenacious people who believed that colon hydrotherapy deserved a prominent place in the world of healing. The initiators were: Dorothy Hawks, Specialty Health; Richard Stockman, an attorney; Angelia Foster, a colon hydrotherapist; Garry Wates and Harold Knockstedt, Naturopathic Doctors; and Connie Allred, a colon hydrotherapist."⁷³

The first National Conference of ACTA was hosted on May 19, 1990 at the Angelia Foster Center, Bon Air, Alabama.

The original members of the ACTA Board (1990 - 1991) were: Connie Allred, President; Dorothy Hawks, Vice-President; Angelia Foster, R.N., Secretary/Treasurer; Harold Knockstedt, N.D., Barbara Clayton, Dixie Allred, B.S. Ed., Roberly Herschler, and Gary Wates, N.D. were all Board Members. (Note: Garry Wates, N.D. was elected the original ACTA President, however after experiencing severe health problems, he gave up the position after six weeks to Connie Allred.)

In addition, to the Board, the founding members of ACTA in alphabetical order, were: Don Allegro, Sterling Allred, D.C., Darlene Ruesink, Golda Alice Gruel, Ray Levinson, Benjamin Shield, S.I.P., Sandy Shirley, R.N., Robley H. Pryor, I-Lan Irie, Valerie Wedderburn, LMT, Hadidhja Lamas, M.D., and Luc De Schepper, M.D.

In spite of the initial energies and enthusiasm of this group, external events soon created havoc with the fledgling Board.

At the same time, a second association, the National Colon Therapy Association (NCTA) based in Maryland with Ann Robinson, the President was undergoing similar problems trying to keep the association afloat. By the end of 1990, these two organizations merged into the one remaining organization, ACTA.

The second ACTA conference was held in February, 1992 at Allred Technique, in Los Angeles, CA. Of note in this meeting was a decision that ACTA members would require the clients to insert the speculum or rectal nozzle. This policy was put in place in part to protect the therapist from charges of practicing medicine for if the client does the inserting the therapist is only "renting space and assisting the clients" in their cleansing process.⁷⁴

The newly elected Board of ACTA (1992) was as follows: President, Connie Allred; Vice President, William Tiller; Secretary, Shirley Hooker (after a sudden family illness, Shirley was replaced in June with Charlotte Layne); Treasurer, Sandy Shirley. Other Board Members included: Deborah Boyar, Judith Fenley, Lillian Holliger, Jim Jeffers, Dale-Lin Mallonen, Maria Tablal, Adrienne Tripolt, and Doris Dieterman.

With a new resurgence, ACTA began to grow. At the same time, colon hydrotherapy in California was under fire. A California Assembly Bill (AB857) attempted to prohibit the practice of colon hydrotherapy in California. As a result of the efforts of many people, in particular, Leslie Williams, Connie Allred, and Bill Hemby and California Senator Diane Watson, this bill was eventually overthrown.⁷⁵ Through this experience, the profession grew stronger and more united.

The third Convention was held at the San Antonio, TX - Float, Massage, and Colon Therapy - clinic of William Tiller during February 1993. Dr. Bernard Jenson was the keynote speaker for this gathering. The ACTA Board remained the same to ensure consistency during this time of growth.

In May 1993, during a Board of Directors meeting, the name of the association was changed to I-ACT, the International Association for Colon Hydrotherapy as there were members from England, Canada and Israel. The Regional Representative structure was defined at this meeting along with identifying the requirements to be certified at

the Foundation Level by I-ACT.⁷⁶

The 1994 Convention was held in Clearwater, FL at the end of April. At this convention, the membership elected to office the following individuals: President, Leslie Williams, Vice-President, Jesse Brown, Secretary, Charlotte Layne, and Treasurer, Gwenn Palmer.

In March 1995, the Convention was held in Seattle, WA. As a result of the growth of the association, and confusion on the election at the convention, the determination was made to have all elections made by mail so all active members in good standing would have the opportunity to vote. This resulted in the Board remaining the same.

A mid-term ballot was mailed to all members resulting in the following Board of Directors: President, William Tiller, ND; Vice-President, Lillian Holliger; Secretary, Sherri Ann Boylan; Treasurer, Connie Allred; Board Members, Terry Allard, Ray Dotolo, Jean-Claude Rodet, Trisha Rossi, and Brenda Watson.

The 1996 Convention was held in Louisville, KY. This monumental event, held at the end of April and the first of May, marked the first mass certification of members. With the thrust of this convention on education and certification, over 50 members passed the Foundation and Intermediate Level exams. 48 members also received their instructor certification at this convention.

The only change to the Board in 1996 was Board member Constance Jones replaced Terry Allard.

The 1997 Convention was held in Orlando, FL. Education and certification were still hot items. 20 individuals completed their instructor certification, while over 25 members passed the level 1 & Level 2 certification exams.

The Board for 1997 was as follows: President, William Tiller, ND; Vice-President, Brenda Watson; Secretary, Millie Girouard; Treasurer, Con-

nie Allred; Board Members, Ray Dotolo, Suzanne Gray, Cherie Kolbo, Constance Jones, and Trisha Rossi.

The 1998 Convention was held in May in San Francisco, CA. The newly published I-ACT Standard Operating Procedures, Regulation and Guidelines was passed out to the membership.

The Board for 1998 was: President, William Tiller, ND; Vice-President, Brenda Watson; Secretary, Millie Girouard; Treasurer, Connie Allred; Board Members, Ray Dotolo, Suzanne Gray, Daisy Hawkins, Constance Jones, and Marti Montero.

The 1999 Convention was held in Virginia Beach, VA during May 1999; highlighted by a tour of the Edgar Cayce facility.

The Board for 1999 was: President, Brenda Watson; Vice-President, Marti Montero; Secretary, Millie Girouard; Treasurer, Connie Allred; Board Members, Ray Dotolo, Suzanne Gray, Daisy Hawkins, Constance Jones, and Maury Solomon.

The 2000 Convention was held in April in Colorado Springs, CO. At this convention, testing for the new advanced level commenced. I-ACT now had four levels of Certification; Level 1, Foundation; Level 2, Intermediate; Level 3, Advanced; and Level 4, Instructor. The National Board for Colon Hydrotherapy (NBCHT) was formed as a subsidiary of I-ACT.

The I-ACT Board for 2000 was as follows: President, Brenda Watson; Vice-President, Marti Montero; Secretary, Millie Girouard; Treasurer, Connie Allred; Board Members, Ray Dotolo, Suzanne Gray, Daisy Hawkins, Constance Jones, and Maury Solomon.

The newly formed National Board for Colon Hydrotherapy (tasked with securing national certification status) was: President, William Tiller, ND; Vice-President, Cheryl Sullivan, ND; Secre-

tary/Treasurer Caitlyn Mayfair, RN; Board Member at large, Robert Angus, ND; and Civilian Board Member, Joel Baseman, Ph.D.

The 2001 Convention was held in May, 2001 in Dallas, TX. The highlight of this Convention was the start up of the I-ACT Ambassador Program a program, designed to take accurate and approved information to the public via I-ACT trained and certified Ambassadors. Also of note was the release of an article by Dr. Morton Walker from the Townsend Letter showing support for colon hydrotherapy from numerous medical doctors and other health care practitioners.

The 2001 I-ACT Board was as follows: President, Brenda Watson; Vice-President, Marti Montero; Secretary, Millie Girouard; Treasurer, Connie Allred; Board Members, Ray Dotolo, Jim Girouard, Suzanne Gray, Constance Jones, and Maury Solomon. The NBCHT Board was as follows: President, William Tiller, ND; Vice-President, Cheryl Sullivan, ND; Secretary/Treasurer Belinda Parker, RN; Board Member at large, Robert Angus, ND; and Civilian Board Member, Joel Baseman, Ph.D.

The 2002 Convention was held in June in Orlando Florida. This meeting was notable as the first grandfather exam for individuals seeking National Board Certification. 284 I-ACT members achieved National Certification as a result of this exam.

The 2002 election resulted in the following Boards: President, Brenda Watson; Vice-President, Russell Kolbo, ND; Secretary, Millie Girouard; Treasurer, Connie Allred; Board Members, Ray Dotolo, Jim Girouard, Suzanne Gray, Constance Jones, and Maury Solomon. The NBCHT Board was as follows: President, William Tiller, ND; Vice-President, Cheryl Sullivan, ND; Secretary/Treasurer Belinda Parker, RN; Board Member at large, Robert Angus, ND; and Civilian Board Member, Joel Baseman, Ph.D.

This brings us up to the present. Our

thanks go out to the pioneers that brought us to this point. The future of colon hydrotherapy is in the hands of this generation of therapists.

The 2003 Convention was held in June in Snowbird Ski Resort, just outside of Salt Lake City, UT. This meeting was first retreat convention allowing time for the participants to commune with the beautiful nature of the Utah mountains

The 2003 election resulted in the following Boards: President, Brenda Watson; Vice-President, Russell Kolbo, ND; Secretary, Millie Girouard; Treasurer, Marti Snyder; Board Members, Ray Dotolo, Jim Girouard, Suzanne Gray, Constance Jones, and Maury Solomon. Later in her term, Constance Jones stepped down and was replaced by Lila Reader. The NBCHT Board was as follows: President, William Tiller, ND; Vice-President, Barbara Chivvis, RN; Secretary/Treasurer Belinda Parker, RN; Board Member at large, Robert Angus, ND; and Civilian Board Member, Joel Baseman, Ph.D. As a special note, Connie Allred, one of the original founders of ACTA and I-ACT retired and at Board direction, her lifetime of service to the profession was honored by proclaiming her a lifetime Honorary Board Member.

The 2004 Convention returned to Florida and was held at the St. Petersburg Hilton. Fortunately this convention was held in mid-June and the devastating hurricanes that hit Florida were avoided.

The 2004 election resulted in the following Boards: President, Brenda Watson; Vice-President, Russell Kolbo, ND; Secretary, Millie Girouard; Treasurer, Marti Snyder; Board Members, Ray Dotolo, Jim Girouard, Suzanne Gray, Lila Reader, and Maury Solomon. The NBCHT Board was as follows: President, William Tiller, ND; Vice-President, Barbara Chivvis, RN; Secretary/Treasurer Belinda Parker, RN; Board Member at large, Bekki Medsker, ND, and Civilian Board Member position was unfilled.

Prior to 2005, as a result of a By-Laws change, Ray Dotolo stepped down from the I-ACT

Board and William Tiller, ND stepped down from the NBCHT Board. Each had served the membership tirelessly and with impeccable integrity.

The 2005 Convention was held at the Alexis Park, Las Vegas, NV.

With By-Laws dated Sept 2005, the membership ratified new bylaws for I-ACT which established a new structure for the Board of Directors. The intent of the structure was to add stability to the officers of the corporation. At this time, there is a President, President Elect, Vice President, and a Secretary/Treasurer. Then there are three Board Members at Large. I-ACT elections are only held every two years (odd years).

After the 2005 election, the board had the following structure: President, Marti Montero; President Elect, Russell Kolbo, DC, ND; Vice President, Pam Craig; Secretary/Treasurer, Millie Menchaca; and the three Board members were, Joyce Long, Lila Reader, and Jim Girouard. Joyce Long was not able to fill the position and she was replaced by Dorothy Chandler, RN. Shortly after the election, Marti Montero had to step down for family reasons, so Russell Kolbo assumed the role of Acting President and President Elect.

The NBCHT Board was as follows: President, Barbara Chivvis, RN; Vice-President, Bekki Medsker, ND; Secretary/Treasurer Belinda Parker, RN; Board Member at large, open; and Civilian Board Member position was open.

The 2006 Convention returned to the Hilton at St. Petersburg, FL.

The only election in 2006 was for the National Board. The results of this election resulted in the following Board structure: President, Barbara Chivvis, RN; Vice President, Bekki Medsker, ND; Secretary/Treasurer, Belinda Massey, RN; Board member at large, Caroline Alexander; and Civilian Board Member, John Grauerholz, MD.

In February, 2007, Jim Girouard resigned from the I-ACT Board, and in March, the Board selected Sylvester Yong, MD, to replace him.

The 2007 Convention was held at the Wyndham Greenspoint, Houston, TX.

A By-Law change (August 2007) converted the NBCHT Officers on the Board to a structure similar to the I-ACT Officers of their Board. Additionally, a position of President Emeritus was added to each Board.

The 2007 election resulted in the following Board structures.

I-ACT Board: President, Russell Kolbo, DC, ND; President Elect, Pam Craig; Vice President, Dorothy Chandler, RN; Secretary/Treasurer, Millie Menchaca; and the three Board members were, Gail Naas, Lila Reader, and Sylvester Yong, MD. President Emeritus was Brenda Watson.

NBCHT Board: President, Barbara Chivvis, RN; President Elect & Vice President, Bekki Medsker, ND; Secretary/Treasurer, Belinda Massey, RN. The Board member at Large was Caroline Alexander, and the Civilian Board Member at Large was John Grauerholz, MD.

In March 2008, the NBCHT contracted with Schroeter Measurement Technologies, Inc. (SMT) for a complete update of the Job Analysis, task analysis, item writing and development of a new NBCHT national exam.

The 2008 Convention returned to the Alexis Park Hotel, Las Vegas, NV. This convention hosted over 650 members with more than 300 members taking the NBCHT National Exam.

I-ACT celebrated it's twenty year anniversary in 2009 and held the Convention at the Crowne Plaza Hotel at the Historic Union Station at Indianapolis, IN. It was a fabulous event that featured authentic Hawaiian Dancers and a headliner, Ron

Ellington Shy, one of the original Coasters and Drifters.

The 2009 Election provided the following Board structures:

I-ACT Board: President, Pam Craig; President Elect, Dorothy Chandler, RN; Vice President, Gail Naas; Secretary/Treasurer, Millie Menchaca; and the three Board members were, Suzanne Childré, Lila Reader, and Sylvester Yong, MD. President Emeritus was Russell Kolbo, DC, ND.

NBCHT Board: NBCHT Board: Acting President & President Elect, Bekki Medsker, ND; Vice President, Edgar Guess, MD; Secretary/Treasurer, Belinda Massey, RN. The Board member at Large was Valentina Van Poucke (Uskache), and the Civilian Board Member at Large was Gloria Gilbere, ND, DA. President Emeritus was Barbara Chivvis, RN.

The 2010 Convention returned to the Hilton at St. Petersburg, FL. At this convention, the NBCHT made the announcement that the state of Florida will start using the new NBCHT National Exam to test Florida applicants for licensure. The agreement with the State of Florida was finalized on August 16, 2010. This brought a new level of professionalism to I-ACT, the NBCHT and our membership.

The 2011 Convention was held at the Embassy Suites, Portland, OR. There was a dinner cruise on the spirit of Portland that was a huge success.

The 2011 Election resulted in the following Board structures:

I-ACT Board: President, Dorothy Chandler, RN; President Elect, Gail Naas; Vice President, Sylvester Yong, MD; Secretary/Treasurer, Millie Menchaca; and the three Board members were, Beverley Blass, Suzanne Childré, and Russell Kolbo, DC, ND. President Emeritus was Pam Craig,

B.Sci.

NBCHT Board: NBCHT Board: President, Bekki Medsker, ND; President Elect, Edgar Guess, MD; Vice President, Belinda Massey, RN.; Secretary/Treasurer, Terri Hawkins-Fox. The Board member at Large was Valentina Van Poucke, and the Civilian Board Member at Large was Gloria Gilbere, ND, DA. President Emeritus was Barbara Chivvis, RN.

The 2012 Convention was held in Skokie IL, just outside Chicago. The members took a Dinner cruise viewing the Chicago skyline, and celebrated with a Roaring 20s theme.

During this convention, the Board established new conflict of interest guidelines for all future Boards. The membership was very enthusiastic with these new changes. Also at this convention, the NBCHT presented a plan to finally separate the corporations.

The 2013 Convention was held at the Renaissance Hotel, Orlando, FL. Seaworld was just across the street. This was the first Hotel that was fully aware of healthy eating styles. To the pleasure of the members, Green drinks were available every morning.

Anatomy & Physiology -

SECTION 1

Introduction

The human body is, without a doubt, the most magnificent and complex organism in the universe. Due to the complexity of our body, any study of anatomy and physiology will necessarily pale in relation.

Taber's describes anatomy as the "structure of an organism" while physiology is "the science of the functions of the living organism and its components, and of the chemical and physical processes involved." Most simply, anatomy and physiology, is form and function.

The purpose of this chapter is to identify the basics of anatomy and physiology with particular attention paid to the digestive system and the alimentary tract. However, in order to gain a complete understanding of the alimentary tract and the digestive system, it is important to start at the beginning and gain a cursory knowledge of the levels of organization of the body followed by a discussion of the 11 body systems, and their relationship to the digestive system.

Levels of Organization

Without delving into sub atomic particles and quantum physics, the most basic unit of matter is the atom. Atoms then combine to form molecules. The smallest level of the living organism is the cell with its numerous parts called organelles. Cells make up tissues of the body which in turn comprise organs and organ systems culminating in the body.

The 11 systems of the body are integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive,

urinary and reproductive. Each systems with the exception of the reproductive system (which is involved in reproducing future generations) is involved in maintaining the life of the organism, and supports the need to survive. Each system will be discussed in detail later.

Survival

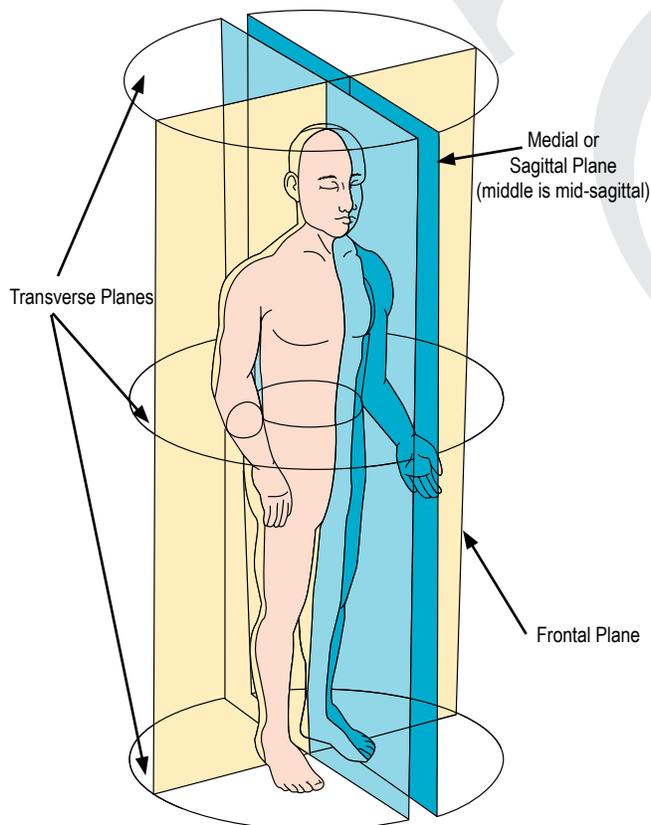
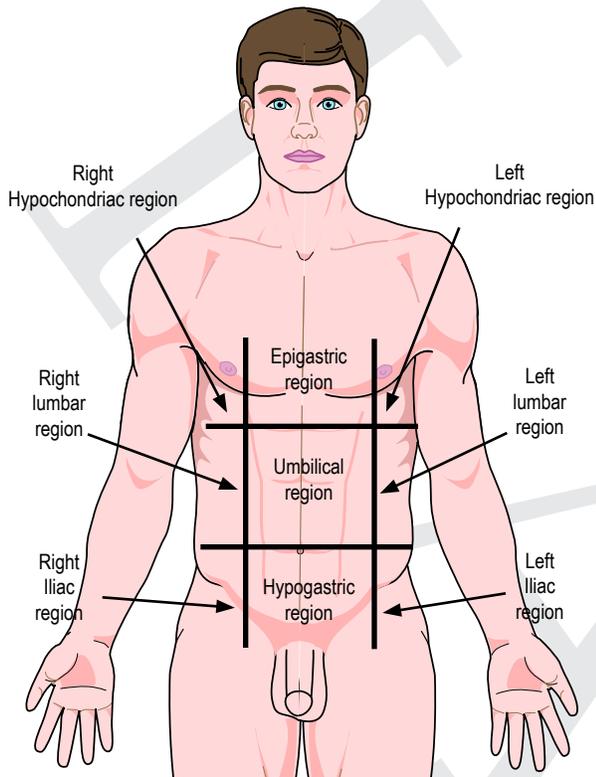
Survival of the organism requires abundant water, adequate food, oxygen, heat and atmospheric pressure. Simply having access to each of these factors is not sufficient, they must be present in the proper amount and must be regulated properly to ensure survival.

The ability to maintain a stable environment to sustain life is called homeostasis. Taber's describes homeostasis as, "the state of dynamic equilibrium of the internal environment of the body that is maintained by the ever-changing process of feedback and regulation in response to external or internal changes."

In most cases, the body responds in a process described as "negative feedback". For example, if the blood sugar were to rise the pancreas would detect a change to normal status and release insulin. The insulin causes the blood sugars to move into the cells and to be stored in the liver and muscular tissue which causes the blood sugar to decrease back to normal. If the blood sugar drops below normal concentration, the pancreas notices the low blood sugar and releases glucagon which brings sugar from the liver and muscles back to the blood resulting in an increase in blood sugar levels back to normal.

Negative feedback means that the body will not generally respond until there is a variation from the norm.

Regions of the Body



Planes of the Body or Sections
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Body Cavities

The body is broken into the following cavities:

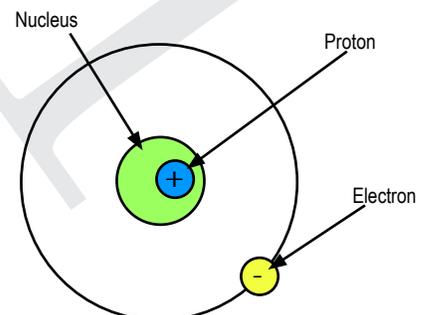
- Cranial cavity - holds the brain
- Spinal cavity - holds the spinal cord
- Thoracic cavity - holds the lungs and mediastinum and pericardial cavity
- Pericardial cavity - holds the heart
- Abdominal cavity - holds the small and large intestines, and other organs including the stomach, liver, spleen, and gallbladder and pelvic cavity
- Pelvic cavity - rectum and internal reproductive organs

SECTION 2

Chemistry and Human Life

Atoms are the building blocks of all matter in the universe. Atoms make up elements that in turn make up matter in one of three states, either gas, liquid, or solid.

The atom is comprised of a nucleus and one or more electrons (negatively charged particles). The nucleus is comprised of protons (positively charged particles) and neutrons (neutrally charged particles). The number of electrons in the rings of the atom equal the number of protons in the nucleus.



Hydrogen Atom

The first electron shell can hold up to two electrons, while the second shell can hold up to 8 more electrons. The number of protons, neutrons and electrons determine the element.

Isotopes are atoms of an element that have a different number of neutrons. The number of protons and the number of neutrons make up the mass number. For example, a hydrogen element with only one proton is defined as ^1H , add a neutron to the element and you have ^2H , or deuterium. If you add another neutron, you get ^3H or tritium.

Atoms attempt to form chemical bonds with other elements by combining the electrons in the outer shell. However, when the outermost electron shell of an atom has the maximum number of electrons for that shell, then that element is called inert.

When two or more atoms chemically bond together by sharing electrons in their outer shells, the result is a molecule. If a molecule contains atoms of more than one element, then you have a compound. There are two ways to bond atoms, ionic bonds and covalent bonds.

Ionic bonds are defined as elements donating an electron or two to another element in an effort to fill the outer electron shell on one element. The result is either a negatively charged ion called an anion, or a positively charged ion called a cation.

Covalent bonds are a simple sharing of electrons to fill the outer electron ring.

Compounds are characterized as either organic or inorganic. In general inorganic compounds do not contain carbon atoms (the exception is carbon dioxide), while all organic compounds do contain carbon atoms. The human body contains both inorganic and organic compounds. Inorganic compounds in the human body include, but are not limited to, carbon dioxide, inorganic acids and bases, salts, and water.

Acids break apart in solution to release hydrogen ions. One of the strongest acids in the human body is hydrochloric acid.

On the other hand, a base will remove a hydrogen ion from solution.

The pH value is a number between 0 and 14 that identifies how acid, or basic a solution is. (0) represents a very acid solution, while (14) represents a very basic solution. A solution is considered to be acidic below 7 while above 7 is considered to be basic, or alkaline.

A blood pH below 7 can produce a coma while a blood pH above 7.8 can cause sustained and uncontrollable muscular contractions. Since the body is continually undergoing many chemical reactions, the compound that attempts to control the pH swings is called a buffer. In the body, the most widely used is carbonic acid-bicarbonate buffer such as those found in antacid products.

Another inorganic compound in the body is the salt. This inorganic compound dissolves in water but does not release a hydrogen or hydroxide ion. Salts are compounds known as electrolytes which are held together by ionic bonds and readily break apart in water. The most common of these are calcium, chloride, potassium, and sodium.

Salts are compounds that are an example of an electrolyte. Electrolytes are solutions that can carry an electrical charge. Common electrolytes are acids, bases, and salts.

Organic Substances

Carbohydrates, lipids, proteins, and nucleic acids are all organic substances.

Carbohydrates are stored as energy reserves and provide the energy required by cells. A carbohydrate atom is made of carbon, hydrogen, and oxygen. Familiar carbohydrates are starches and sugars.

Carbohydrate molecules are joined in chains with a variable length. The shorter chains are called sugars, or monosaccharides.

Starches are poly saccharides, which are nothing more than a group of simple sugar units. In our bodies, we synthesize a poly saccharide called glycogen.

Lipids are also comprised of carbon, hydrogen, and oxygen, but have fewer oxygen molecules than carbohydrates. Lipids are insoluble in water. They include phospholipids, triglycerides, and steroids like cholesterol.

The most common lipids are fats. Gram for gram, fats provide more energy than carbohydrates.

Proteins also contain atoms of carbon, hydrogen, and oxygen, but unlike carbohydrates and lipids, proteins also include nitrogen and in some cases, sulphur. Proteins are built of amino acids. In the human body, there are about 20 different types of amino acids.

Protein may have as few as 1,000 amino acids, or as many as 100,000, or more. Each type of protein is composed of a specific number and a specific arrangement of these amino acids. Changing either the number of amino acids, the sequence or the structure will have a major change on the function of the protein.

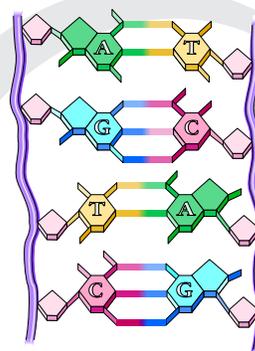
Enzymes are a special type of protein that can act as a catalyst, or a compound that can speed up a chemical reaction without being changed or used up. This is important as the chemical reaction in a human body may be too slow, so the catalyst (enzyme) can speed up the action.

As mentioned earlier, changing either the number of amino acids, the sequence or the structure will have a major change on the function of the protein. There are many ways that the shape,

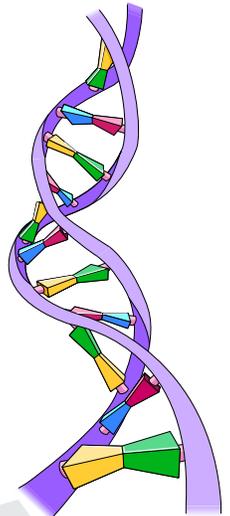
sequence, or structure, of a protein may be changed thereby changing the function of the protein. For example, a change of the body fluids pH, or the temperature of the body may cause the function of the proteins to change, and in some extreme cases result in death.

Finally, nucleic acids are also made up of carbon, hydrogen, and oxygen. In addition, nucleic acids also require nitrogen and phosphorous. These substances are bound into the basic building blocks of Nucleic acids called nucleotides. The two types of nucleic acids are deoxyribonucleic acid (DNA) and ribonucleic acid (RNA).

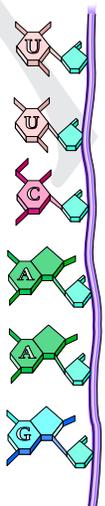
DNA is comprised of the sugar deoxyribose, and four organic nucleotide of adenine, guanine, cystine, and thymine (A,G,C, & T). The genetic code of the DNA molecule is determined by the sequence of the nucleotide in the DNA



double helix. Notice that adenine can only bond with thymine while cytosine bonds only with guanine.



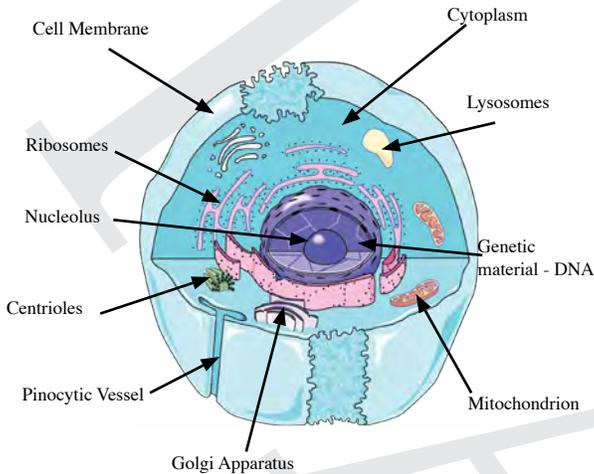
RNA is made of a single chain of nucleotide. Is comprised of the sugar ribose, and the four organic nucleotide of adenine, guanine, cystine, and uracil. RNA serves as a messenger to relay information from the nucleus to the cytoplasm.



SECTION 3

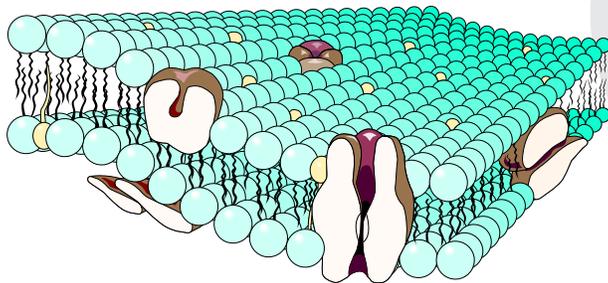
Cells - Structure and Function

Our bodies are made up entirely of cells, trillions and trillions of them. Each of the cells is unique in their function and their shapes, however, there are many common characteristics of each type of cell.



The cell structure is composed of the cell membrane and cytoplasm. The cell membrane is usually comprised of two lipid (fat) molecules with different proteins and a small number of carbohydrates. The proteins act as points of attachment for materials entering and departing the cell.

The cell membrane regulates what enters and leaves the cells. It does this through a process called selective permeability. It is the fat molecules



in the cell membrane that protects the cytoplasm of the cell from the surrounding extra cellular fluids.

If a cell does not allow anything to pass the membrane it is said to be impermeable. If substances can pass freely, the cell is freely permeable; however, as described above, most cells are selectively permeable. Some materials are allowed to pass freely while other materials are restricted.

In addition, the ability to move materials through the cell membrane are classified as either passive (without the use of energy) or active (requiring the cells to expend energy).

There are three passive processes: diffusion (including facilitated diffusion), osmosis, and filtration.

Diffusion is the movement of substance from an area of high concentration to lower concentration. For example, if you place table salt in a glass of water, the salt will eventually dissolve evenly throughout the entire glass of water until it reaches a condition of equilibrium. The process of facilitated diffusion is as the name implies, a diffusion process that is facilitated in most cases by lipid molecules that make up the cellular membrane. While oxygen and carbon dioxide are soluble in lipids and are readily diffused across a cell membrane, other molecules such as glucose require help making the transition through the cell membrane. A carrier molecule on the cell membrane combines with the glucose molecule forming a lipid soluble compound that diffuses through the membrane where the glucose is released and the carrier molecule returns to the other side of the membrane.

Osmosis is simply the diffusion of water across a cell membrane. In this case, water passes a selectively permeable membrane from a condition of low solute concentration (high water) to a condition where the solute concentration is higher (low water content). This transfer of water will continue until equilibrium is reached. There are three conditions of cellular concentration of solutes: isotonic, hypotonic, and hypertonic.

In an isotonic solution, the solute concentration of the cell is equal to the solute concentration of the solution. In a hypotonic solution, the solute concentration of the cell is less than the solute concentration of the solution thereby causing water to flow into the cell. In a hypertonic solution, the solute concentration of the cell is greater than

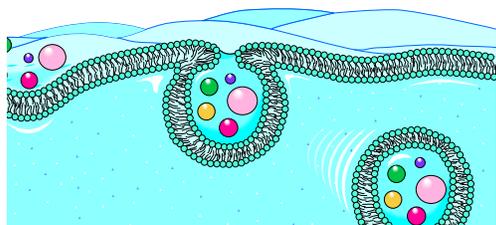
the solute concentration of the solution resulting in water flowing out of the cell into the solution. In all cases, the body seeks equilibrium.

Filtration is a process whereby water and small solute particles are forced across a membrane as a result of pressure from either a higher hydrostatic source or from blood pressure. In this case, as the blood pressure from the arterial system moves in to the arterioles and the capillaries; water and small solute particles (food, etc.) move across the cell membrane bringing nutrients, water, and oxygen into the body tissue.

The active process involving the movement of molecules are substantially different from the passive processes. All active processes require the expenditure of energy to perform its function. There are two specific types of active processes, active transport and endocytosis.

While the passive processes require movement from a solution of higher concentration to a solution of lower concentration, active transport works oppositely. In this case the molecules move from an area of low concentration to an area of higher concentration. Active transport requires the energy of Adenosine Triphosphate (ATP) molecules. ATP is the carrier molecule that acts similarly to the molecular action in facilitate diffusion. This will be discussed in detail later.

Another active process is called endocytosis which allows molecules that may be too large to enter a cell through active transport or any of the passive processes to move into the cell through a tiny vesicle in the cell membrane. Endocytosis has three forms; pinocytosis, phagocytosis and receptor mediated endocytosis.



Pinocytosis, or “cell drinking” occurs when liquid from the surrounding tissue is drawn into a small sack or vesicle in the membrane of the cell, this vesicle is drawn into the cytoplasm of the cell, forming a fluid filled sack which eventually bursts bringing fluid to the cytoplasm of the cell.

Phagocytosis, or “cell eating” is similar except the vesicle contains solid particles instead of fluid. These vesicles are drawn into the cytoplasm of the cell and eventually burst providing nutrients and other solid particles to the cell. While most cells may display pinocytosis, it is generally the white cell or the scavengers that use phagocytosis as they cleanse the body of dead or toxic cells and materials.

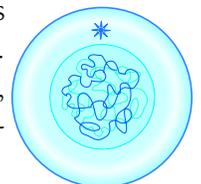
Receptor mediated endocytosis is characterized by movement through the cell wall of specialized or particular molecules. The cell membrane has particular protein molecules forming receptor sites that extend through the membrane, These receptor sites only accept specific kinds of substances into the cell through the vesicle.

The movement of material and liquid into the cells provide the cell with a mechanism to feed, hydrate, and cleanse itself and the surrounding tissue. However, as with all living organisms, cells move through a specific life cycle.

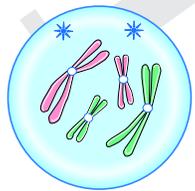
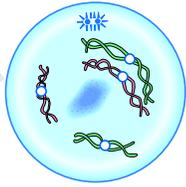
Life Cycle and Division of the Cell

From the birth of the cell to its point of duplication or reproduction is called the life cycle of the cell. All cells progress through a process called mitosis and the specialized cells used for reproduction go through a special process called meiosis.

Mitosis is a continuous, ongoing process which is divided into four phases or stages for ease of understanding. These phases are called prophase, metaphase, anaphase, and telophase.

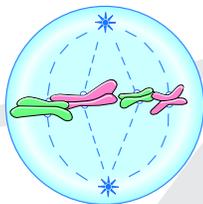


Prophase is the first phase of cell duplication and is evident when the chromosomes appear as a tight coil in the nucleus. At some point, the DNA is replicated resulting in two distinct, yet exact, chromosomes called a chromatid. The centrioles gravitate to the opposite ends of the cell, while the

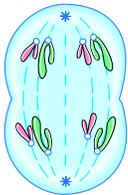


chromatids are connected at a single point called a centromere near the center of the strand. The prophase ends when the membrane of the nucleus disappears.

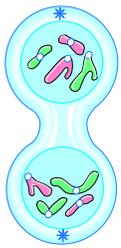
Metaphase is characterized by the formation of microtubules or spindle fibers that align the chromosomes midway between the centrioles in the center of the cell.



Anaphase is recognized when the chromatid pairs split at the centromere and these identical parts become identical chromosomes which move in opposite directions towards the centrioles at each end of the cell.



Finally, the last phase, telophase begins as the identical chromosomes, moving in opposite directions, complete the migration towards the centrioles. The chromosomes begin to elongate into thin strands, a nuclear membrane forms around each set of chromosomes, and the nucleoli reappear. In the end, the tubules or spindle fibers disappear, and the cytoplasm pinches the cell wall until two distinct and separate, yet identical, cells are formed.



This completes the cell division process at which time the cells are in a state called interphase. A phase in which the cells spend most of their lives, they perform the normal cellular function, which includes producing the organelles that

define the function of that cell. After the cell is fully functional, the cell duplicates the DNA and the process starts through another cycle.

During the duplication process, some cells are formed that perform specialized functions. The DNA distinctions for bone cells are different than the cells required for the brain, etc. This results in a process called differentiation. Differentiation leads to specialized cells for special functions. These specialized cells become specialized tissues. Bones are formed, the liver, brain, pancreas, or other organs are developed from these specialized cells. Each tissue, and each organ performing its special function yet each part working in harmony with all other organs and parts with the ultimate goal the survival of the organism.

SECTION 4

Tissues of the Body

There are five major types of tissue in the human Body: epithelial, connective, muscle, and nerve tissue and liquid tissue.

Epithelial Tissue

Epithelial tissues cover all parts of the body, inside and outside, and comprise most of the glands of the body. The best example of epithelial tissue is the skin of the body.

Epithelial tissue always have a free surface, either on the outside or the inside of the body, and additionally, epithelial tissue invariably connected to the underlying connective tissue through a thin layer called the basement layer.

Epithelial tissue is identified by the layer or numbers of layers of the epithelia and by the shape, arrangement, or function of the cells.

For example, simple epithelial tissue has a single layer of cells. Stratified epithelial tissue have several layers of cells and therefore provide greater strength or protection.

The shape or function of the epithelial cells is defined in one of three types: squamous (a thin, flat cell), cuboidal (a square or cube-shaped cell), or columnar (a rectangular, or elongated type of cell).

Types of epithelial tissue:

Simple squamous epithelial tissue is arranged in a single layer of flat irregular cells that may line blood vessels, air cells of lungs, or inside kidney, etc. These cells are generally used anywhere a gas or fluid is absorbed.

Simple cuboidal epithelial tissues are secretory cells, found in lining of ducts, in glands, or the bronchiole of lungs, etc. These cells are found where either secretion or absorption occurs.

Simple columnar epithelial tissues are made of cells that are long and narrow. This tissue also secretes and absorbs and is found in the lining of the intestinal tract, in the bowels, and stomach.

Stratified squamous epithelial tissues are made up of many layers of squamous cells. This makes the tissue much more durable and thicker. The cells generally grow from the inside out and as they move outward they become flatter, eventually they are sloughed off. This tissue makes up the outer layer of skin, the mouth or the vocal cords.

Pseudo-stratified columnar epithelial tissues are comprised of a group of simple columnar cells bunched together with microscopic hairs called cilia. These cells are found in the reproductive tracts, and air conducting pathways where the cilia can trap particles and carry them out of the passage way.

Transitional epithelial tissues are wrinkled, crepe like tissue usually found in bladder, kidneys. This tissue is made up of several layers of cuboidal cells that allow this tissue to contract and expand.

The last type of epithelial tissue is the glandular

epithelial tissue that is made up of special cells that can secrete fluid, or substances into tissue or ducts. These cells group together to become glands. If the gland has a duct and excretes the substance through a duct, then the gland is called an exocrine gland. If the gland secretes into tissue or other body fluid directly, then the gland is identified as an endocrine gland and the secretions are called hormones.

Connective Tissue

Connective tissue has four basic functions. It can bind structures together, it can provide support, it can protect, and it serves as a framework for the body.

Connective tissue is comprised of many types; soft connective tissue, hard connective tissue, bone tissue,

Soft Connective tissues is comprised of loose connective tissue (areolar tissue) which binds skin to underlying tissues, and fills space between muscles. It is located just below epidermis in most cases (called fascia)

Adipose tissue is another form of soft connective tissue, it stores up fat for the body, and uses fat as heat insulator and as padding. The next soft connective tissue is fibrous connective tissue which is composed of collagen and elastic fibers forms ligaments and tendons. Tendons (sinews) attaches muscle to bone and ligaments connect bone to bone or bone to support viscera.

Hard connective tissue is usually called cartilage which is a rigid connective tissue. Generally the cartilage if covered by the perichondrium. There are three types of cartilage.

Fibrocartilage is a tough tissue which is found between the vertebrae and in the pubic symphysis, it provides cushions between the vertebrae, strong support for the backbone, and allows only a minimal-range movement.

Hyaline, contains minimal fibrous tissue. The cells are embedded in a matrix and are found in nose, trachea, and on the ends of bones of movable joints.

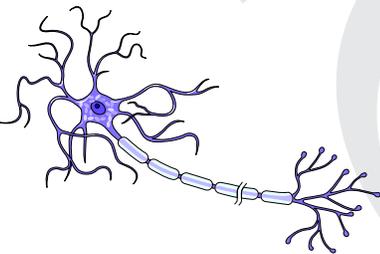
The last type of cartilage is elastic cartilage, most resilient of cartilages. It is found in the external ear, larynx, etc.

Bone Tissue or hard connective tissue is comprised of Osseous tissue which is similar to cartilage in newborn babies. At this point it is soft and malleable. It eventually becomes impregnated with mineral salts (ie. calcium phosphate, calcium carbonate) and hardens.

Nerve Tissue

Another tissue is called nerve tissue which is found in the brain, spinal cord, and other nerves. Nerve tissues is comprised of nerve cells called neurons. These provides neural pathways from brain and spinal cord to all parts of the body.

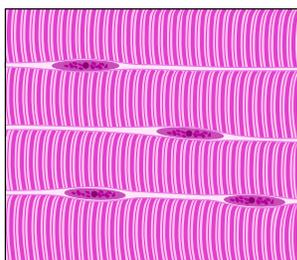
Nerve tissue consists of a nerve cell body and small branches of fibers. One type of fiber is called a dendrite which takes impulses to the nerve cell, another type of fiber is called an axon which takes impulses away from nerve cell.



Peripheral nerves are nerves outside of the brain and spinal cord. The fibers of nerve cells are covered with a protective, insulating sheath around the nerve fiber called myelin.

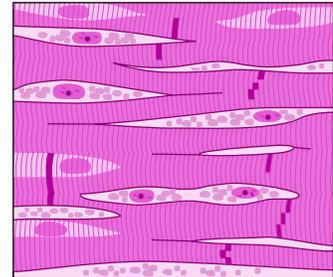
Muscle Tissue

The next type of tissue is called muscle tissue. It is comprised of skeletal muscles attached

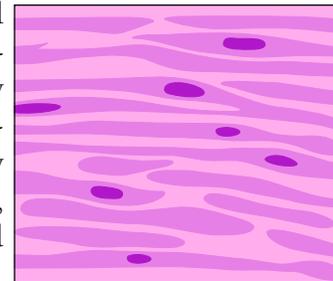


by tendon to bones or other muscles. One style of these skeletal muscles are called voluntary muscles which are controlled by conscious effort. These muscles are generally striated.

A second type of muscle tissue is called cardiac muscles or myocardium. This muscle tissue is found only in the heart, involuntarily controlled, and causes heart to beat.



The last type of muscle tissue is called smooth or visceral muscle. This is controlled involuntarily by nerve or glandular activity and is generally found in the stomach, colon, bladder, and blood vessels.



Liquid Tissue

An unusual type of tissue is identified as liquid tissue. This is comprised of Blood tissue which is a fluid tissue that circulates through the body. Blood tissue provides cellular nutrition, oxygenation and removes waste from cells. A second type of liquid tissue is lymph, which is derived from blood and tissue fluid. It is found in the lymphatic vessels, in adenoids, thymus, tonsils, and the spleen. Lymph tissue is important in producing antibodies that protect the organism. While blood tissue is generally located in blood vessels, and lymph tissue is located in the lymphatic system, there is a liquid tissue called interstitial tissue that is not in the blood or lymphatic system. This interstitial tissue is located in the body, between the cells of the tissue.

SECTION 5

There are 11 separate systems in the body, they are:

The Integumentary System
 The Skeletal System
 The Muscular System
 The Nervous System
 The Endocrine System
 The Cardiovascular System
 The Lymphatic System
 The Respiratory System
 The Urinary System
 The Reproductive System
 The Digestive System

These systems are usually made up of several organs of the body working together to perform important functions for the body. The function or purpose determines the organ system. Although the systems will be discussed separately, it is important to understand they all work in concert to ensure optimum functioning of the body.

SECTION 6

The Integumentary System

The skin is comprised of epithelium and connective tissues making up a membrane called the skin. The skin with various associated organs, such as exocrine glands, hair, and nails, makes up the integumentary system.

There are four types of membranes; serous membranes (which line the body cavities that do not open to the outside), mucous membranes (made of epithelial tissue that line the cavities and tubes that access the outside), cutaneous membranes (made up of epithelial tissue commonly called the skin), and synovial membranes (made up of fibrous connective tissue that line the joint cavities between the ends of freely movable bones - the cavity is filled with lubricating synovial fluid).

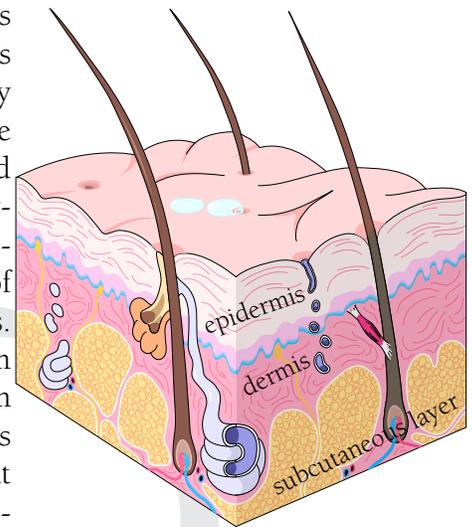
The skin is one of the largest organs of the body and is comprised of two layers of tissue. The outermost layer is called the epidermis while the innermost layer is the dermis. Beneath the dermis is a subcutaneous layer of loose connective and

adipose tissue that functions to bind the skin to the underlying structures.

The skin serves four functions: 1) protection, 2) maintain body temperature, 3) provides sensory receptors, and 4) provides for storage of fats; synthesis of vitamins; and excretion of salts, water and waste,

The Epidermis is composed of epithelium which lacks proper blood supply; however, the deeper cells of the dermis have blood supply which nourishes the entire epidermis. This deepest layer of the epidermis is called the stratum germinativum.

This layer marks the boundary between the epidermis and the underlying connective tissues of the dermis. The stratum germinativum forms ridges and rings that eventually become fingerprints.



As the dermis is moved outward toward the epidermis, the cells eventually become hardened through a process of keratinization. The cells become thickened and eventually the outer cells die or are rubbed away only to be replaced by new layers of epidermis. The surface layer of the epidermis is called the stratum corneum.

The structure of the epidermis varies depending on the region of the body with the thickest layers in the palms of the hands and the soles of the feet.

The color of the skin is determined by the skin pigment which is called melanin. The pig-

ment is either brown, yellow-brown, or black and is produced by a special cell called melanocytes. The different skin color comes not from the number of melanocytes (which in all cases is approximately the same), but from the amount of melanin that the melanocytes produce.

Freckles are the result if the melanin is not distributed evenly.

Although there is much written about the adverse effects of too much sunlight on the skin and the potential for cancer, limited exposure to sunlight is extremely valuable which allows the lower epithelial cells to function to synthesize vitamin D which is essential for bone growth and maintenance.

The dermis lies below the epidermis and provides the nutrients, oxygen and nerve supply for the epidermis. The dermis is comprised of loose connective tissues that attach to the stratum germinativum while the deeper levels of the dermis are comprised of dense connective tissues and bundles of elastic and collagen fibers. The dermis also contains hair follicles, sebaceous and sweat glands, and receptors for temperature change, and pressure sensitivity.

Below the dermis lies the subcutaneous layer or hypodermis. Although it is not a part of the integumentary system, it does provide an important role since it has a layer of adipose tissue that provides a layer of fat that serves to act as a shock absorber from falls, reduce heat loss and provides sources of energy reserves.

Associated Organs of the Skin

Hair Follicles

Hair is present on many of the body surfaces and is developed from a tubelike depression of the dermis called a hair follicle. Hair follicles are made up of the papilla, the hair root, and the hair shaft.

A group of smooth muscles called the arrector pili muscles pull on the follicles and elevate the hairs in response to cold or fear; the result of this muscle contraction is called goose bumps.

Glands

Sebaceous glands secrete a waxy substance called sebum into the hair follicles in an effort to keep the hair and skin soft. If there is an overproduction of sebum, and the hair follicle becomes blocked, then acne may be the result.

Sweat glands also known as sudoriferous glands are of two different types, apocrine sweat glands respond to emotional stress, and are located in the armpits, the nipple, and the groin. These glands generally have an odor or scent. Eccrine glands, on the other hand, respond to elevated body temperature and exercise in an effort to cool the body. These glands produce the clear perspiration known as sweat.

Nails

Nails project from the nail root and cover the tip of the finger over the nail bed. The actual nail is called the nail plate. The white, half-moon shaped crescent is called the lunula and is the most active growing area of the nail. A cuticle is formed over the nail at the location of the root.

Wounds

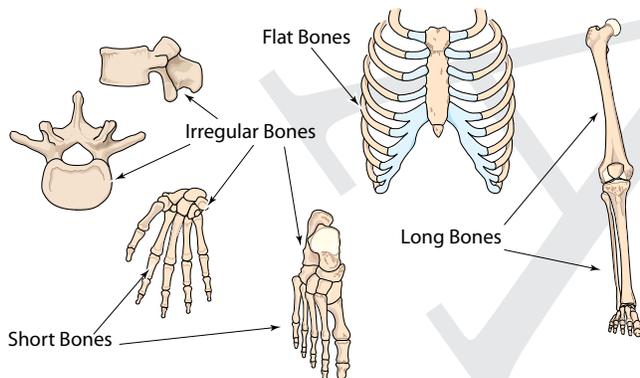
There are five classes of injury to the skin. An abrasion is the result of a scrape. An incision is the result of a cut with bleeding present if deep vessels are injured. A laceration is an irregular tear of the skin. A puncture is a wound from a pointed object that pierces the skin. An avulsion is the most severe as chunks of tissue are ripped from the body by severe force, explosion, or accident.

The Skeletal System

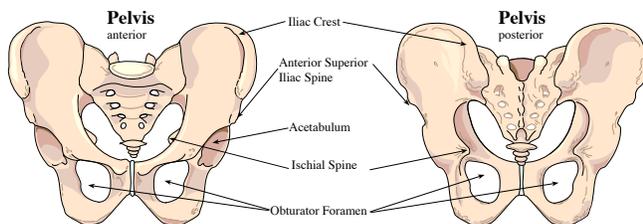
The skeletal system is comprised of 206 bones and numerous cartilages. The skeleton provides structural support to the body; protection for the sensitive and fragile organs such as the brain

and the eyes; a source of movement and action through the lever action at each joint; a storehouse of minerals, calcium, and phosphates; and a source of blood cell production within the internal cavities of the long bones.

Bones are identified by their shape. There are four general shapes; short, flat, irregular, and long. Short bones are the carpals of the wrist and the tarsals of the ankle. Flat bones are the thin bones of the ribs, the skull, and the scapulae. Irregular bones have different shapes that do not fit into any classification. They include some of the facial bones and the vertebrae, bones of the spine.



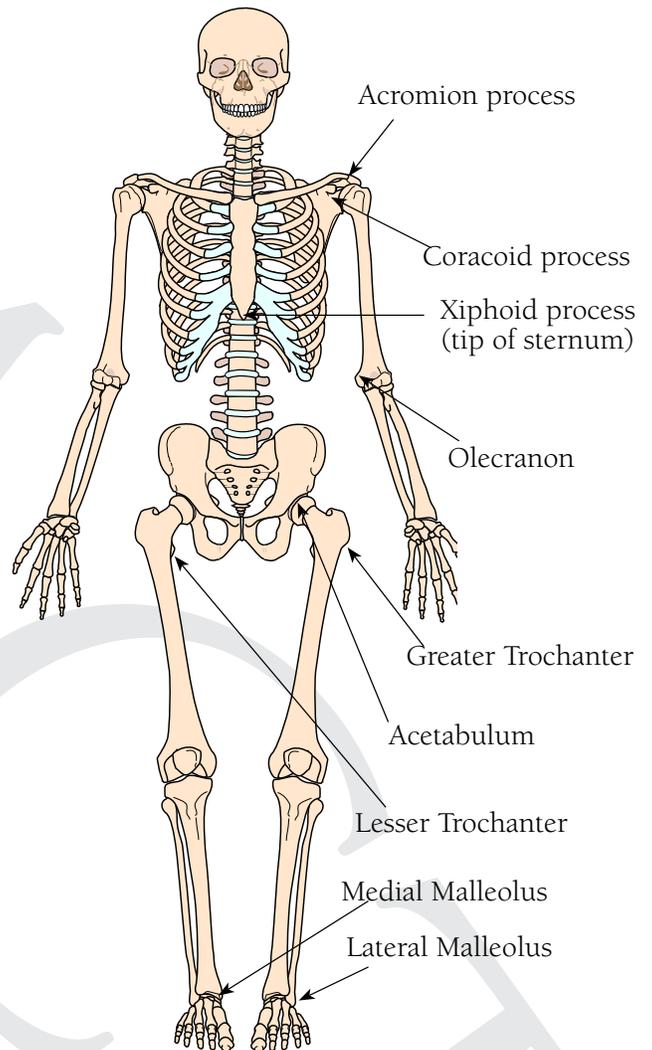
In addition to the shapes of the bones, the bones have particular markings. On articulating surfaces, there is the head of the bone which is the large, round knob of the bone separated from the shaft by a narrow neck. A smooth round bump on the bone is called a condyle. A facet is a flattened surface of the bone.



On non-articulating surfaces, there are numerous markings or prominences. Processes are the points of attachments for tendons and ligaments. Tubercles are small round projections of the bone, a trochanter or tuberosity are large, rough projection. A spine is a sharp, pointed, slender process and a crest is a narrow ridgelike projection.

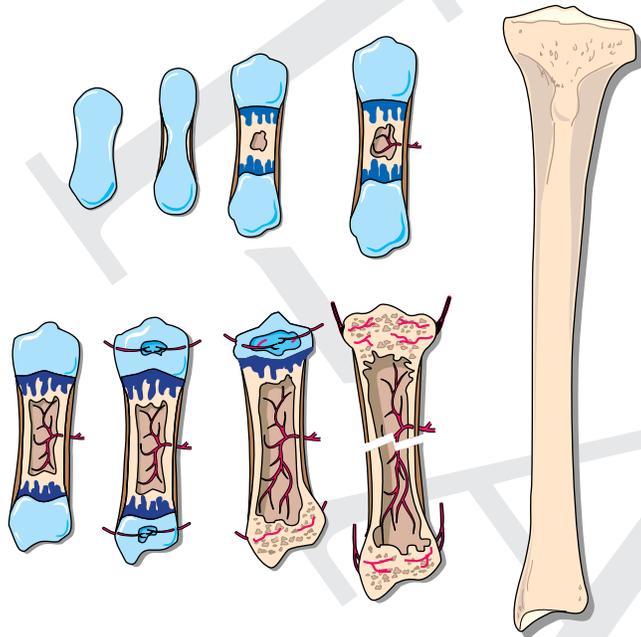
Finally, there are markings of depressions

or openings. A fossa is a shallow surface, a sulcus is a narrow groove that accommodates a vessel or a nerve, a foramen is a round opening through a bone, and a sinus is a cavity or chamber of a bone which is generally filled with air.

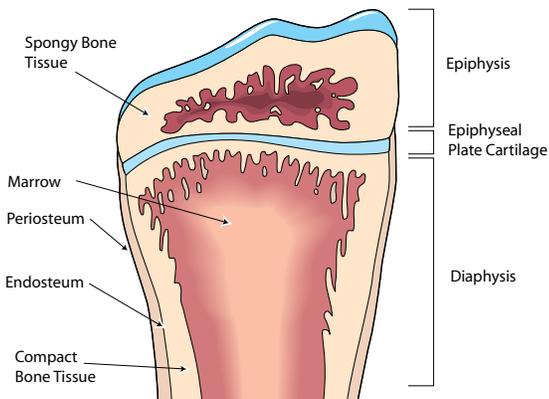


There are three types of bone cells. Osteocytes are the mature bone cells imbedded in the collagen or intercellular material that make up the bone. Osteoblasts are the bone building cells. when they become incased in the surrounding matrix of the intercellular material, they become osteocytes. Finally, the osteoclasts perform the function of breaking down the bone. As the bone breaks down, the minerals, calcium, and phosphates are released and resorbed into the body. When osteoclasts remove the bone faster than the osteocytes replace the bone, then the bones are growing thinner and

weaker. If the osteocytes are building the bone faster than the osteoclasts are removing the bone, then the bone is getting stronger and thicker.

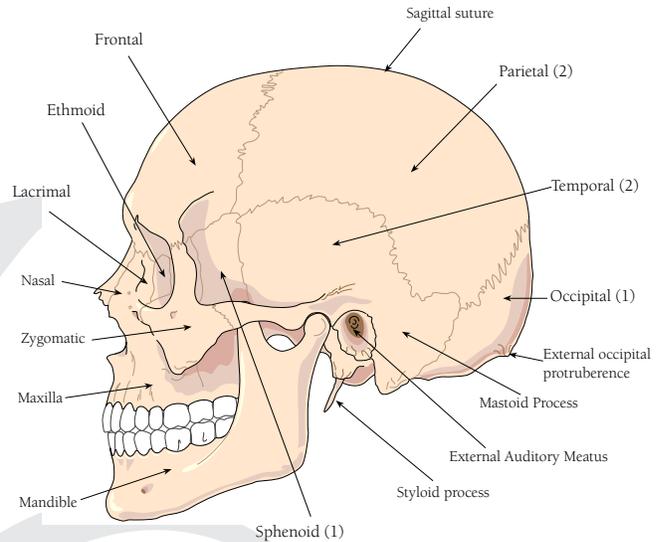


The structure of bones is best described by using the typical long bones of the arms and legs. The bone itself is made of osseous tissue. The long part of the bone is called the diaphysis. The diaphysis surrounds the marrow cavity. Red marrow is where the blood cells are produced while yellow marrow is fat or adipose tissue. The outer layer of the bone is called the periosteum. On each end of the shaft is the expanded portion of the bone known as the epiphysis. If the bones form a joint, then the epiphysis is covered with a hyaline cartilage called the articular cartilage that provides a slippery surface to reduce friction.

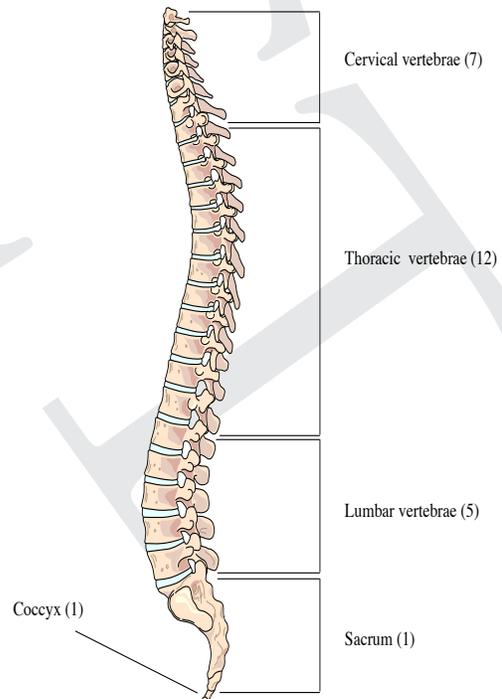


In as much as many of the nerves, arteries, and veins derive their names from the underlying bones, it is important to have a basic understanding of the bones of the body. Starting at the head and working to the feet, the major bones of the head include:

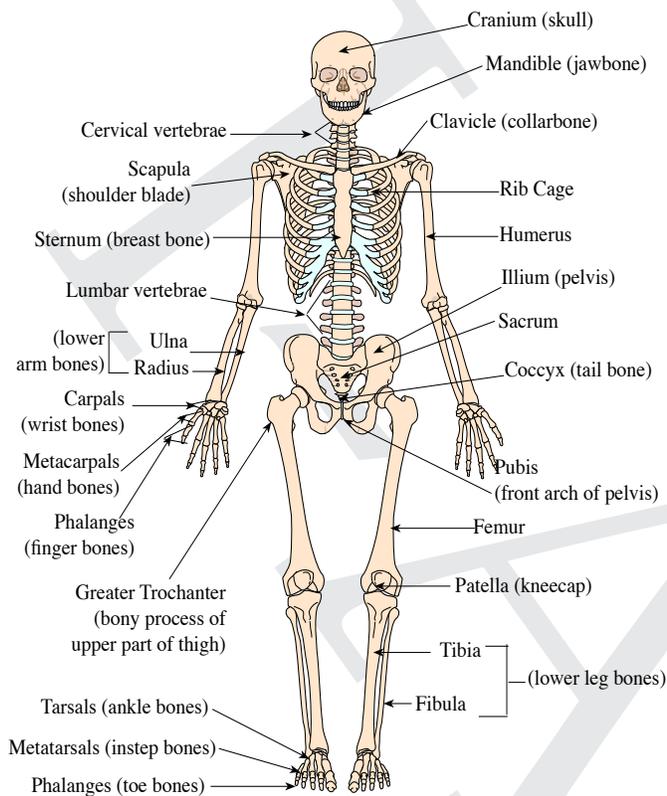
Bones of the Skull (lateral view)



The bones of the vertebrae include:



The bones of the skeleton include:



Although bones are extremely strong, sometimes they fracture. There are six distinct types of fractures.

A greenstick fracture is an incomplete break of the bone. A fissured fracture is also an incomplete break but this fracture is along the longitudinal axis of the bone. A transverse fracture is a complete break of the bone at right angles to the longitudinal axis of the bone, while a comminuted fracture is a complete transverse fracture of the bone with several distinct fragments. An oblique fracture is a break of the bone that is other than a right angle break, and a spiral break is a fracture caused by a twisting action.

Joints

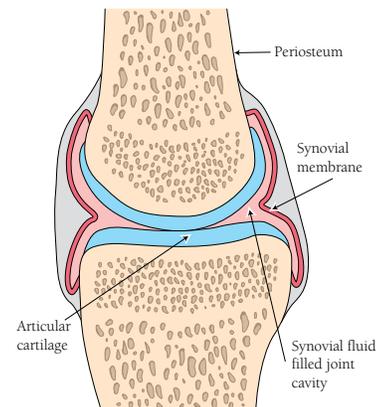
Joints or articulations are identified by the range of motion they allow. An immovable joint such as the sutures of the skull are called a synarthrotic joint. A slightly movable joint, such as

the joints of the spine and the pubic symphysis are called amphiarthrotic joints; and a freely moveable joints are called a diarthrotic joints.

Diarthrotic joints, which provide for a wide range of movements, are also called synovial joints because of the synovial fluid (lubricating fluid) present in the joint capsules of the articulating surfaces. In some cases these joints also incorporate shock absorbing pads called menisci.

There are six types of diarthrotic joints.

A gliding joint (ie, the shoulder clavicle, the ankle tarsal bones, etc) have a flattened surface allowing the bones to slide across one another.



Hinge joints (ie. elbow, knee, etc) allow movement in a single plane of motion

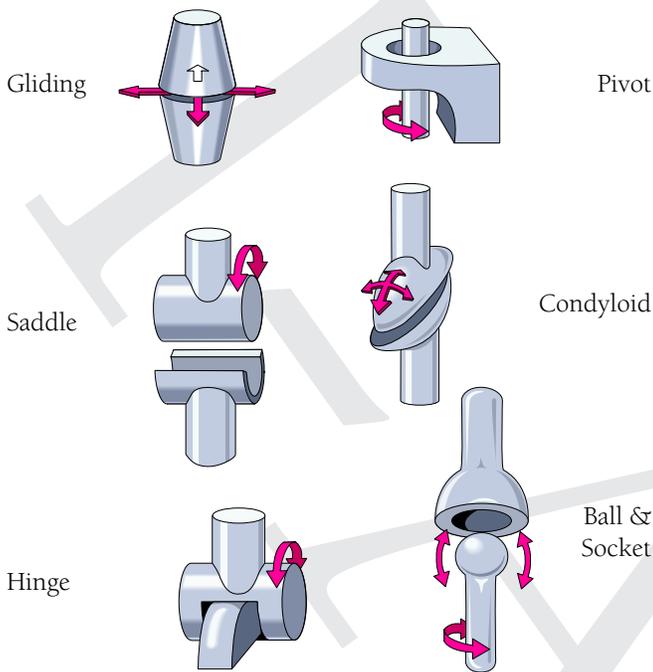
Pivot joints (ie. the joint between the atlas [C1] and the axis [C2] of the vertebrae) permit rotation only.

Condyloid joints (ie. the fingers [metacarpals] and the toes [metatarsals]) are oval-shaped joints, with the opposite sides nested within one another which allows motion on two planes.

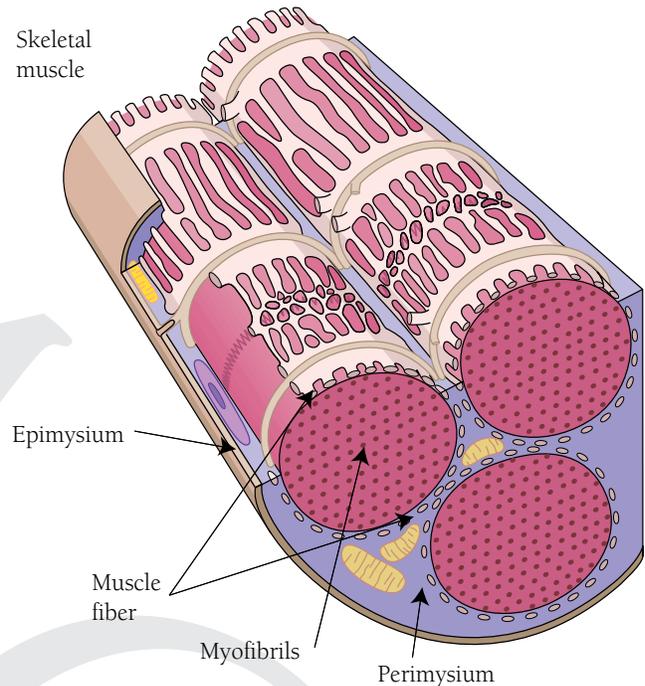
Saddle joints (ie. the joint of the thumb [between the carpal and metacarpal] allow a variety of motion including circumduction, but not rotation.

Ball and socket joints (ie. shoulder or hip) allow movement in all planes along with rotation as the head of one surface articulates within the cup of the other surface.

These diarthrotic joints provide for a variety of joint movements described in the chart below.



Each muscle fiber contains hundreds of myofibrils. Each myofibril is made up of both thin and thick filaments called actin and myosin. These myofibrils are organized in functional units called sarcomeres.



The Muscular System

Muscles provide a vehicle for motion and for all actions of the body. There are three types of muscles; skeletal muscles (that move the body and the bones of the skeleton), smooth muscles (that move material along the digestive tract and in the blood system, etc.), and cardiac muscles (that comprise the chambers of the heart).

This section will only address the skeletal muscles which perform the functions of producing movement, maintaining body posture, and maintain body temperature.

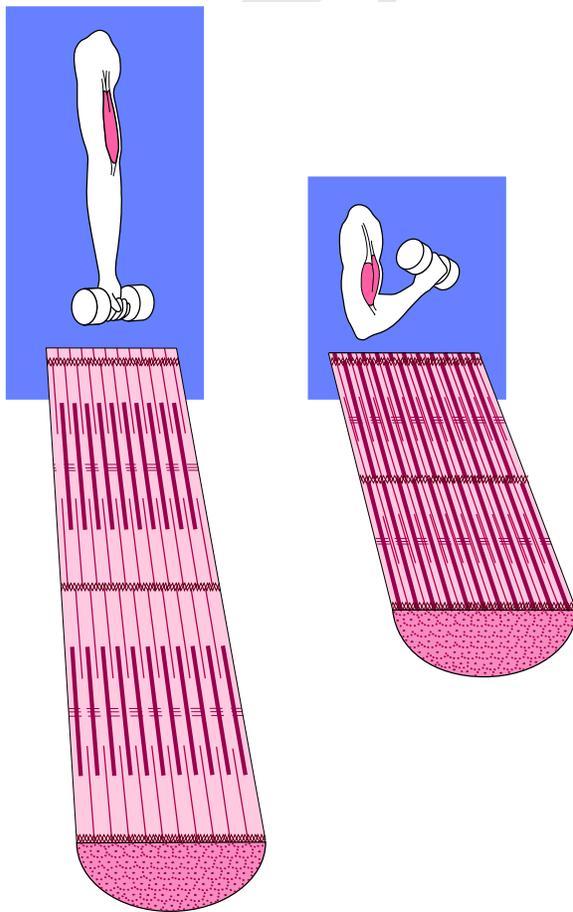
Muscles are bundles of fibers that are covered by a layer of connective tissues called the epimysium. Internal layers of connective tissues are called perimysium which separate the muscle bundle into fibers called fascicles. Each fascicle is covered by a layer of connective tissues called endomysium. This arrangement of layers and bundles allow for independent movement of parts of the muscle bundle.

The muscles are stimulated for movement by the nervous system through a neuromuscular or myoneural junction. The neuromuscular junction is comprised of a conjunction of the axon of a motor neuron connected to a motor end plate of a muscle fiber through a thin space called the synaptic cleft. The end of the motor neuron contains a synaptic knob which has a membrane sac filled with stored chemicals of the neurotransmitter molecules. When a signal is received from the brain, the neurotransmitter is release and picked up by the motor end plate of the muscle which stimulates muscle action.

A motor unit is describes as a motor neuron and the muscle fiber that it controls.

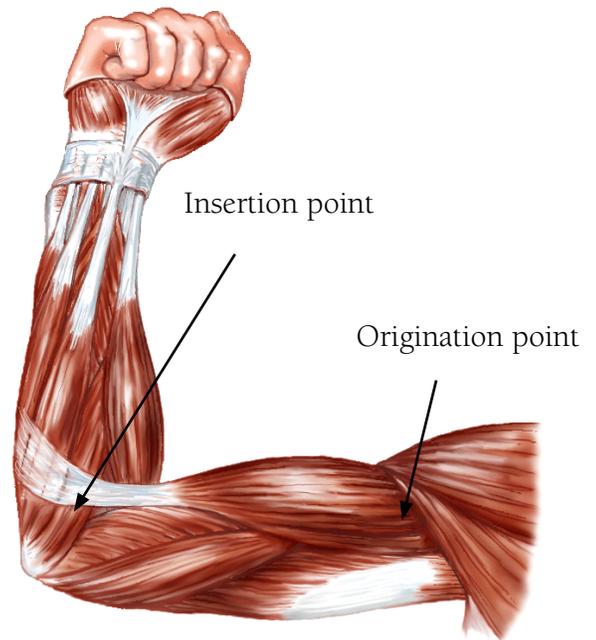
Although a muscle fiber is either all on or all off, this principal only applies to each independent

muscle fiber, not the entire muscle bundle. This allows for the fine micro-muscular movements of the body.



Each muscle fiber contains thousands of myofibrils. Each myofibril contains thousands of actin & myosin filaments. When a muscle contracts, the actin filaments are drawn to overlap, then when the muscle is at rest, the free ends of the actin are only slightly overlapping. When the muscle is stretched, the actin filaments slide apart along the myosin filaments.

Muscles function with bones acting as levers through which the muscles can cause movement. Muscles are attached to the bone through tendons or ligaments at two points. The point of origin is where the muscle attaches to the stationary bone, the other end of the muscle is attached to the bone that moves at the insertion point.



A muscle whose contraction is primarily responsible for that movement is called the prime mover. Muscles that assist the prime mover are called the synergists and muscles that oppose the action of the prime mover are called the antagonist. Since muscles can only shorten, every prime mover requires the action of an antagonist to move the bone back to the original position.

Muscles contract in one of two ways. An isotonic contraction provides enough force to provide movement. The muscle shortens and the bone at the insertion point moves toward the origination point of the muscle. An example of this motion is walking or lifting weights.

In an isometric contraction, the muscles are contracted, but no movement happens, the muscle remains contracted until the pressure is released. An example of this motion is putting pressure against a wall or immovable object, or attempting to lift a tractor trailer. The muscle is contracted, but there is no movement of the bone.

As the muscles are contracted, energy is expended. The energy required for muscular contraction is ATP (adenosiphine triphosphate) The type of exercise determines the type of energy ex-

pended. Aerobic (oxygen required) and anaerobic (without oxygen) are the two types of exercise.

Aerobic exercises stimulate an increase in the number of mitochondria which increases the production of ATP and also increases the amount of myoglobin (the oxygen bringing pigment of the muscle) which provides an oxygen reserve for the muscle used during contraction.

In aerobic exercise, the glucose is broken down in the mitochondria forming pyruvic acid and a small amount of ATP. Eventually the pyruvic acid breaks down into lactic acid. The ATP from the mitochondria in concert with the oxygen from the myoglobin continue to provide energy for the exercise. Assuming the mitochondria can continue to produce ATP and the oxygen levels remains adequate, the muscle fibers can function in this aerobic condition for extended periods of time, such as running a marathon. Exhaustion occurs when the when the muscle fibers run out of the organic materials necessary for conversion into ATP by the mitochondria. As the ATP is broken down, energy is released and ATP becomes ADP (adenosine diphosphate) and phosphate. Creatine phosphate, also available in muscle tissue, assists in regenerating ADP into ATP.

In anaerobic exercises, the glucose is broken down in the mitochondria forming pyruvic acid and a small amount of ATP. When this small amount of ATP is expended, and in a non-oxygen environment, glucose molecules are split to form ATP and pyruvic acid which sustain the muscular action for a short period of time. This process is called glycolysis. Eventually the pyruvic acid is converted into lactic acid which releases hydrogen ions causing a decline in pH of the muscle fiber. This pH change can eventually disrupt enzyme activities and the muscle loses the ability to function normally.

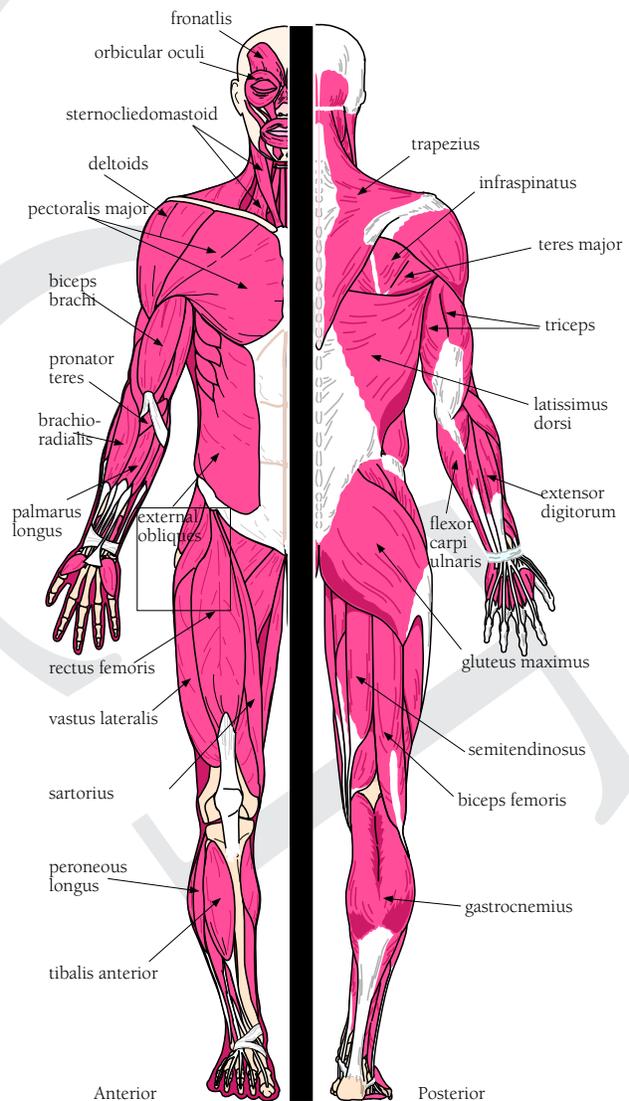
During the periods following activity, the muscles must have a period of recovery, lactic acid is eventually converted back to glucose, glycogen levels are rebuilt in the muscle, and the heat gen-

erated from the exercise must be lost through the cooling caused by perspiration.

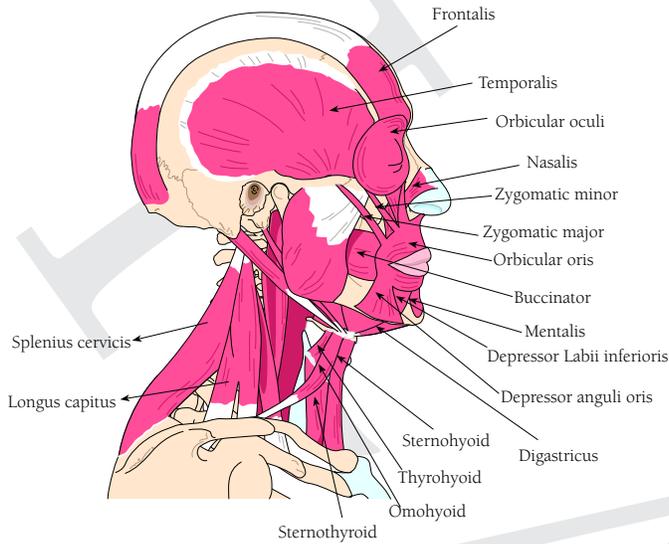
When muscles are used they grow and strengthen this process is called hypertrophy. If muscles are not used they will shrink and become weaker, this process is called atrophy.

There are approximately 700 muscles in the body. These muscles are named according to their shape, size, location in the body, number of attachments, etc. For example, the pronator teres muscle is a short muscle that connects the humerus to the ulna and rotates the arm medially so that the hand is turned so the palm is facing down.

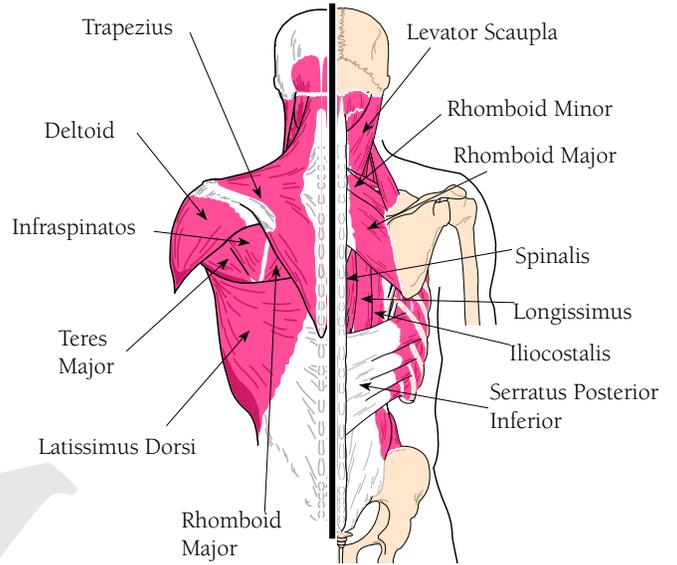
Major Muscles of the Body Anterior



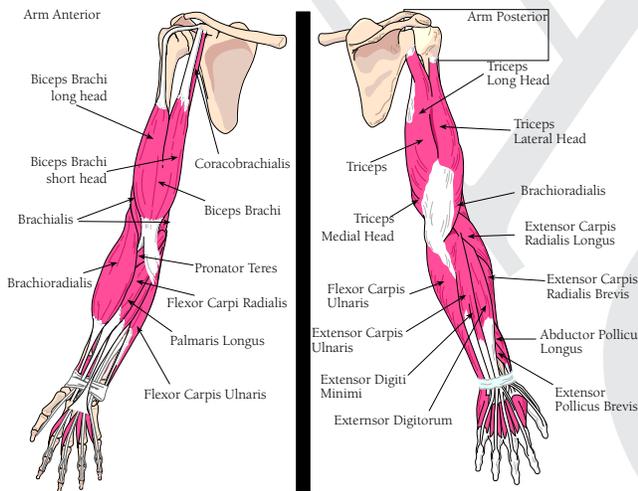
Muscles of the Face & Head



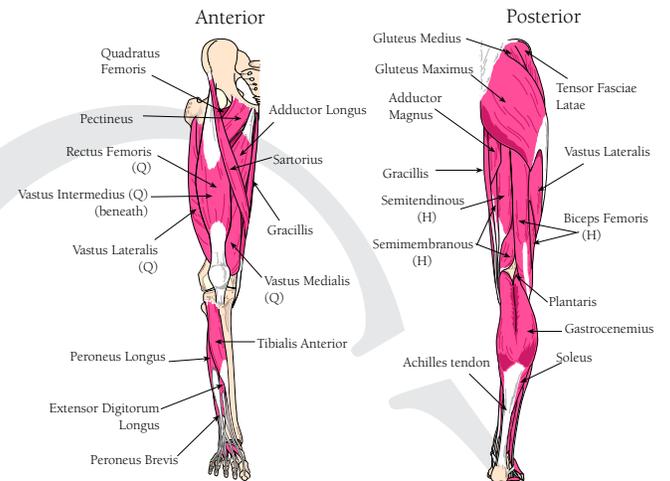
Muscles of the back (interior / exterior)



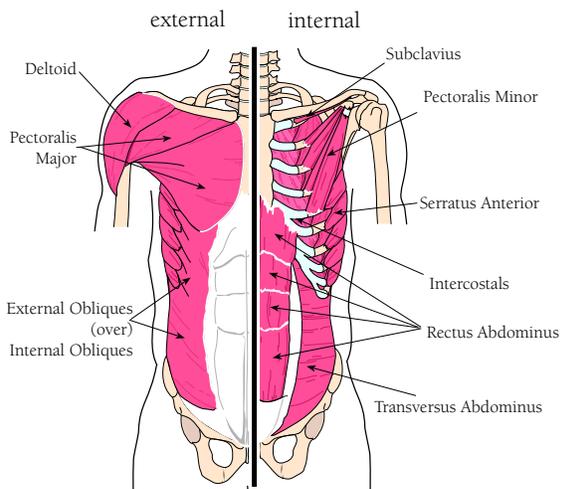
Muscles of the Arm (Anterior / Posterior)



Muscles of the Leg (Anterior / Posterior)



Muscles of the Chest (interior/exterior)



Nervous System

The nervous system serves three functions, it monitors, integrates and directs or coordinates the information and responses to the other organs of the body.

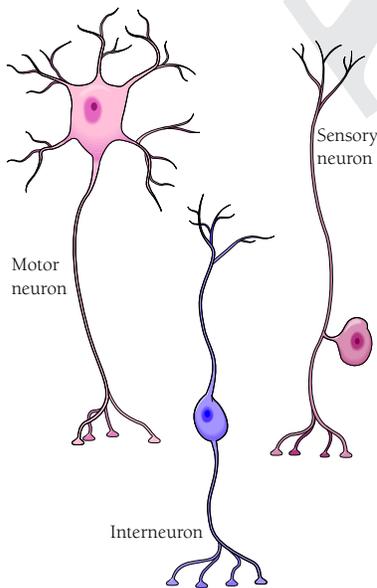
The nervous system is divided into two groups, the central nervous system (comprised of the brain and spinal cord), and the peripheral nervous system which is made up of all nerves outside the central nervous system.

Information flows in the nervous system in two ways, first, information flows toward the brain (in the afferent division) bringing information from sensory receptors and the sense organs. The information is processed and then flows from the brain through the spinal cord (in the efferent division) taking information to the muscles and other organs.

The peripheral nervous system is divided into two systems, the somatic nervous system which provides information to all skeletal muscles, while the second system is the autonomic nervous system which is broken down into the sympathetic (action causing) and parasympathetic systems (action inhibiting) systems.

Nerves cells are called neurons and nerve supporting cells are called neuroglia.

There are three types of neurons, the sensory neuron (afferent neuron), the motor neuron (efferent neuron), and the interneuron.



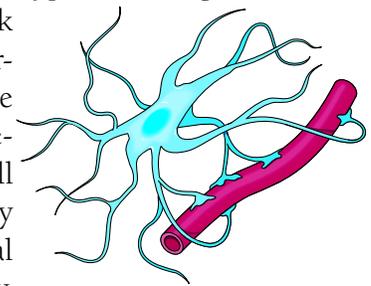
Sensory neurons bring information from outside and inside the body to the central nervous system.

The motor neuron carries impulses from the central nervous system to tissues, organs, or muscles controlled by motor neurons called effectors.

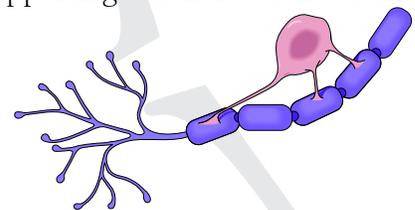
These effectors are outside the nervous system and effect the body in some manner.

Interneurons are only found within the brain and spinal cord, and are responsible for integrating the sensory information and the motor commands to provide a coordinating structure.

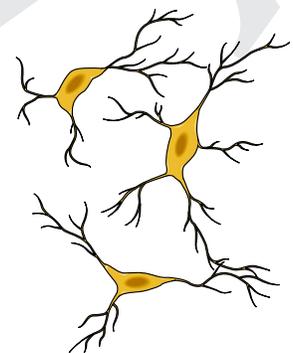
The nerve supporting cells called neuroglia are broken down into many types. Astrocytes are the most common type of neuroglia and form a supporting network for the central nervous system where they are found between the nerve cell and the blood supply providing structural support. Additionally, astrocytes have a nutritive function assisting the transport of nutrition from the blood supply to the neurons of the brain maintaining the blood-brain barrier.



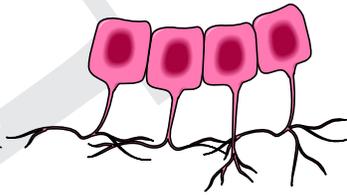
Oligodendrocytes are less in number compared to the astrocytes and arrange themselves around the nerve fibers forming myelin sheaths protecting and supporting the nerve cells of the brain and the spinal cord. A Schwann cell performs the same function of creating a myelin sheath for nerve cells located in the peripheral nervous system.



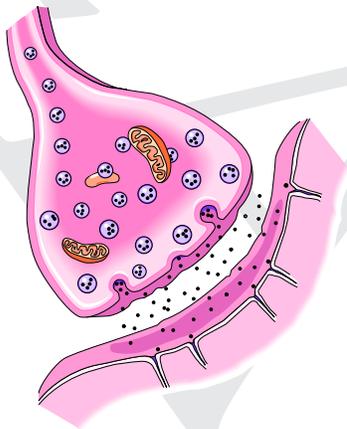
Microglia, as the name implies, are the smallest of the neuroglia cells and function in cleaning the nervous system of cellular debris and bacteria through a process called phagocytosis.



The next type of neuroglia cells are the ependymal cell. These cells form the single cell membrane that covers the ventricles and central canal of the brain.



Throughout the nervous system, nerve impulses travel along the nerve pathways from one neuron to another neuron. The space between the neurons is called a synapse. The neuron that is sending the information is called presynaptic while the neuron that receives the information is called postsynaptic. Information flowing along the nerve pathways must pass the gap at the synapse. This gap is called the synaptic cleft. Information only flows through the synaptic cleft by the use of neurotransmitters.



One of the most common neurotransmitters is acetylcholine which stimulates muscular contractions at the myoneural junction. Another group of neurotransmitters called monoamines include norepinephrine, epinephrine, dopamine, and serotonin. These are formed by modifying amino acid chains. Acetylcholine and norepinephrine both act to stimulate post synaptic cells while dopamine and serotonin have an inhibitory effect.

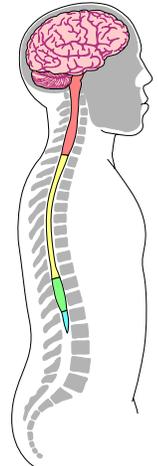
In addition to neurotransmitters, there is a class of peptides called neuropeptides that are produced in the brain or spinal cord and function as a neurotransmitter.

The Central Nervous System

As mentioned earlier, the CNS is made up of the brain and the spinal cord. Since the brain

and spinal cord are extremely sensitive, they are covered by a membrane called the meninges for protection.

The meninges has three layers. The dura mater is made up of two layers and make up the outermost layer of the meninges. The space between the inner and outer layer of the dura mater is filled with loose connective tissue and contains tissue fluid and blood vessels.

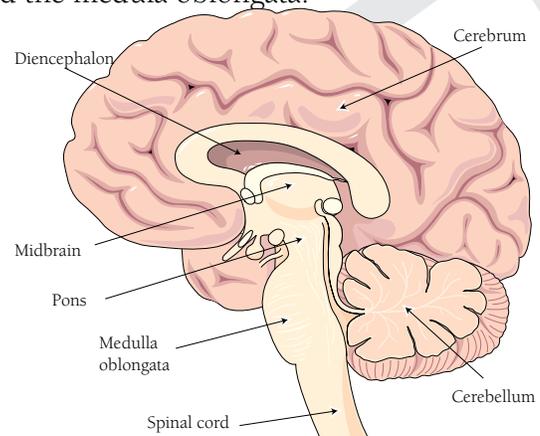


The second layer of the meninges is called the arachnoid. This layer is comprised of collagen that is similar to a net or web of elastic fibers.

The innermost layer is called the pia mater. This layer is very thin and attaches to the irregular surface of the underlying organs and supports the blood vessels supplying blood to the brain and spinal column. Between the arachnoid and the pia mater is a fluid filled area that acts as a shock absorber for the brain and the spinal cord. This clear, watery fluid is cerebrospinal fluid.

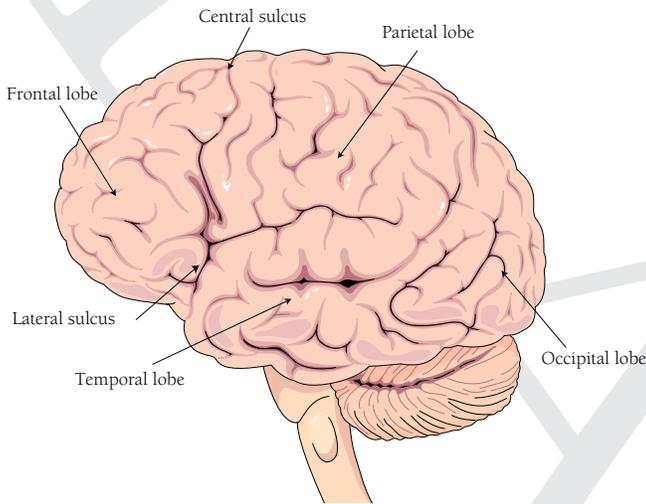
The Brain

Even though the brain is the most complex and largest organ of the nervous system, we know relatively little about its functioning. The brain contains six major regions, the cerebrum, the diencephalon, the midbrain, the pons, the cerebellum, and the medulla oblongata.



The cerebrum is divided into two large left and right cerebral hemispheres which are connected by a deep group of nerve fibers called the corpus callosum.

The lobes of the cerebral hemispheres are named after the cranial bones surrounding the brain.



The cerebellum also has two hemispheres which are separated by a layer of dura mater called the falx cerebelli. The cerebellum adjusts muscle tone and maintains balance and equilibrium. It fine tunes and smooths all of our movements, and controls and coordinates all skeletal muscles.

Hidden beneath the cerebrum is the diencephalon which connects the cerebral hemispheres with the other parts of the brain. It sits between the cerebrum and on top of the brain stem.

The brain stem is made of the midbrain, pons, and medulla oblongata. The midbrain is located between the diencephalon and the pons. The midbrain contains centers for visual and auditory reflexes and assists in maintaining posture.

The pons acts as a bridge connecting the brain stem and the cerebellum and relays information from peripheral nerves to the higher brain centers.

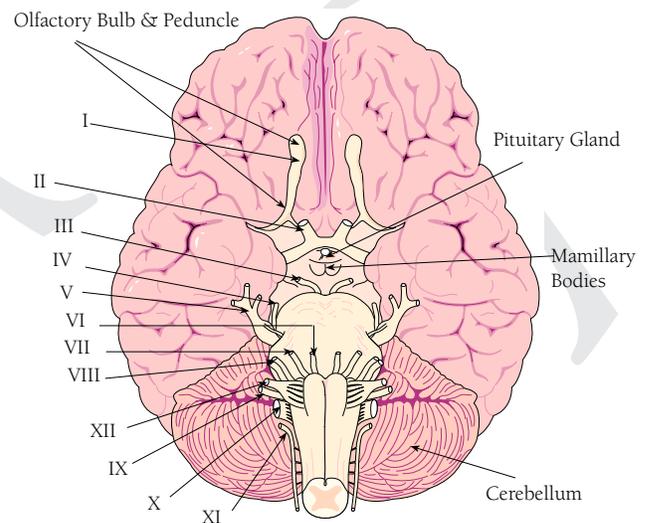
The medulla oblongata connects the brain stem to the spinal cord. It acts as a relay of sensory information to the thalamus and other systems of the brain stem. The sides of the medulla oblongata are raised allowing for large bundles of nerve fibers that pass directly to the cerebellum. Additionally, all information that flows from the brain to the spinal cord and back, must flow through the the medulla oblongata. It regulates the respiration, control of the heart rate, blood pressure and digestive activities.

The Peripheral Nervous System

The peripheral nervous system (PNS) carries to and receives information from the CNS to/from other body parts and organs. It includes the cranial nerves and the spinal nerves.

The PNS is divided into the somatic and autonomic nervous systems. The somatic system includes cranial nerves and spinal nerves that connect the skin and skeletal muscles to the CNS. The autonomic nervous system connects the CNS to the organs, glands, intestines, and stomach.

There are 12 pairs of cranial nerves which are identified either by number or by name.



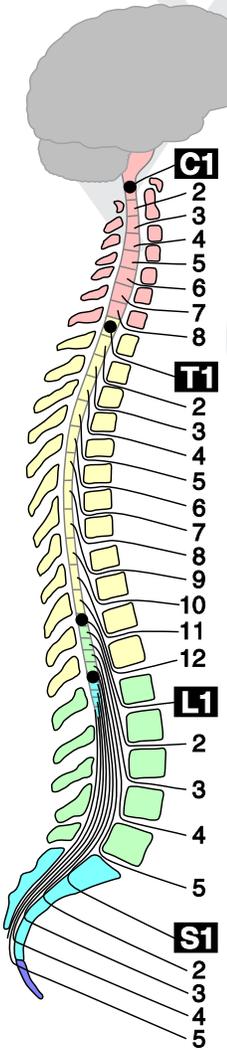
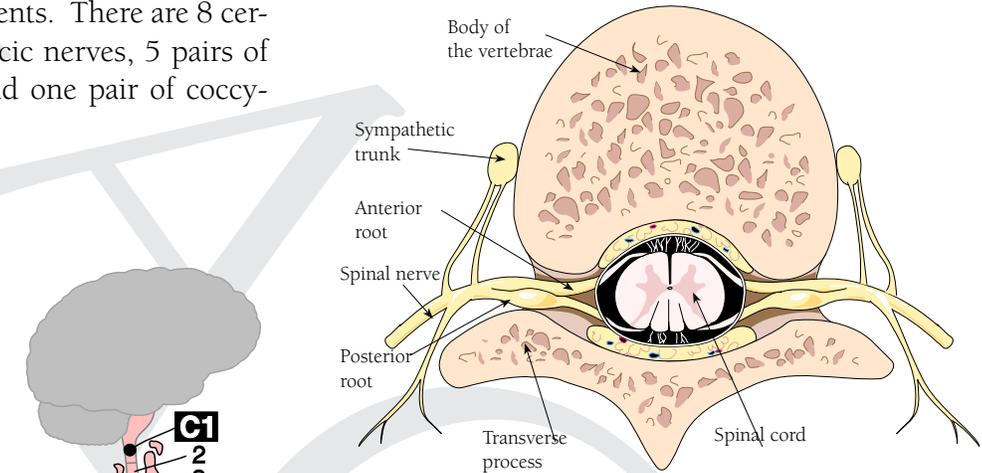
The spinal cord serves as the pathway for all impulses to and from the brain and is a center for spinal reflexes. The spinal cord is about 18

Cranial Nerve	Type of Nerve	Location	Function
1 olfactory nerve	sensory	nose	smell
2 optic nerve	sensory	retina of eye	sight
3 oculomotor nerve	motor	muscle of eye	controls eye movement
4 trochlear nerve	motor	obliquus superioris	rotates eye down and out
5 trigeminal trifacial nerve	motor/sensory	face teeth & tongue	controls movements
6 abducent nerve	motor	recti muscle of eye	rotates eye outward
7 facial nerve	motor & sensory	face & neck	controls face expressions
8 acoustic (auditory)	sensory	ear	hearing
9 glossopharyngeal	motor & sensory	tongue & pharynx	taste
10 vagus or pneumogastric nerve	motor & sensory	pharynx, larynx, heart	talking, breathing, digestion
11 spinal accessory	motor	shoulder	moves neck muscles
12 hypoglossal	motor	tongue & neck	movement of tongue

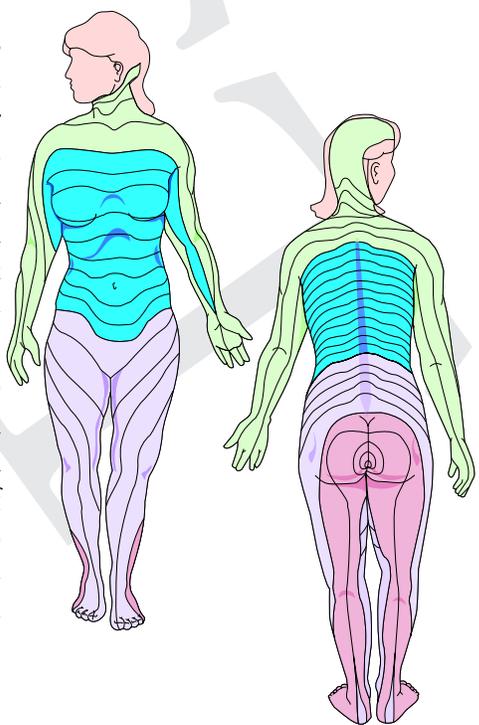
inches long, and has 31 segments. There are 8 cervical nerves, 12 pair of thoracic nerves, 5 pairs of lumbar and sacral nerves, and one pair of coccygeal nerves.

The Spinal Cord

In the vertebral canal, the spinal nerves divide into two branches. The ventral root (anterior branch) or descending tract, carries information from the brain, through the axons of motor neurons, to the muscle bundles and glands. The dorsal root (posterior branch) or ascending tract, bring sensory information to the spinal cord through the axons of the sensory nerves. Each dorsal root of a spinal nerve has a corresponding dorsal root ganglion. This ganglion contain the cell bodies of sensory neurons whose dendrites carry impulses from the body part or organ inward to the brain.



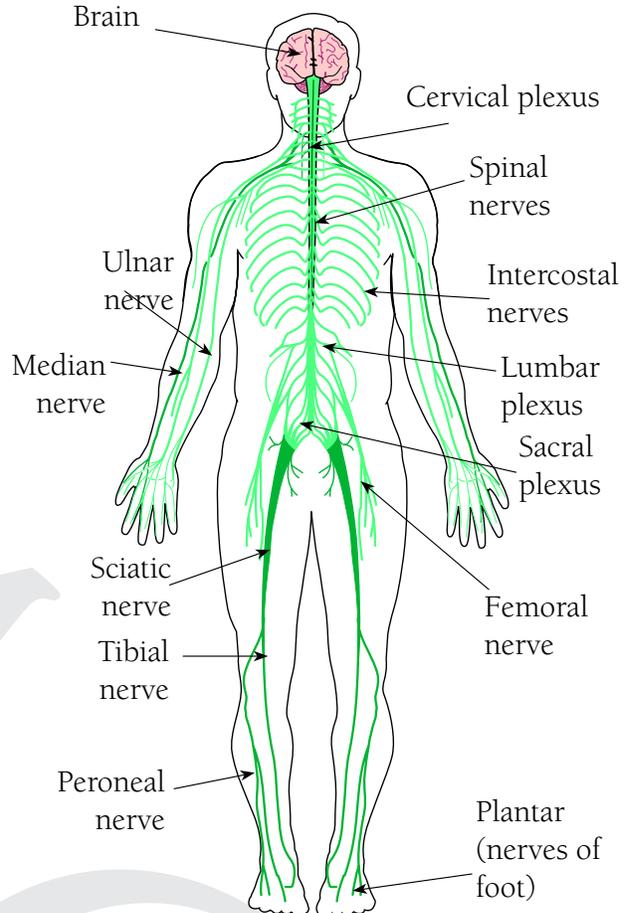
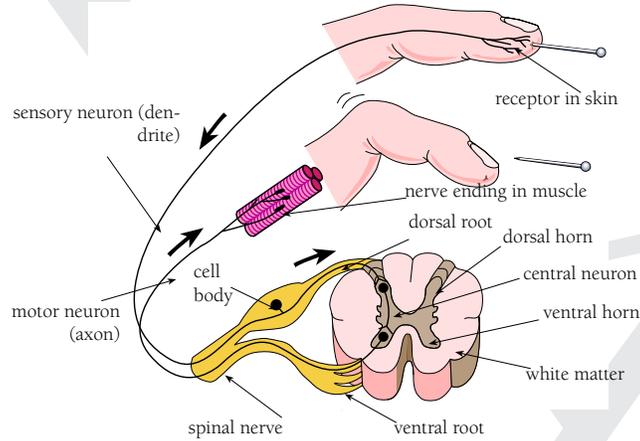
Dermatomes define the regions or body surfaces that are served by a specific pair of spinal nerves. Damage to any spinal nerve will cause loss of sensation to that particular dermatome area.



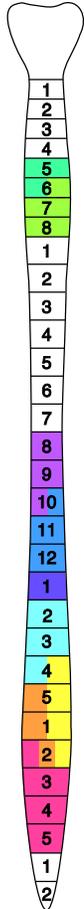
Reflexes

Reflexes are an automatic and unconscious response to a stimuli that requires immediate reactions without time for thought.

A withdrawl reflex is a reflex involving a sensory neuron reacting through interneurons in the spinal cord directly with a motor neuron.



Spinal Nerves of the Body



Muscle stretch reflexes

■ Biceps	C5-6
■ Supinator (brachioradialis)	C5-6
■ Triceps	C6-8
■ Knee	L2-4
■ Ankle	L5-S2

Cutaneous reflexes

■ Abdominal - Upper	T8-10
■ Abdominal - Lower	T10-12
■ Cremasteric	L1
■ Plantar	L4-S2
■ Anal	S2-5

Autonomic Nervous System

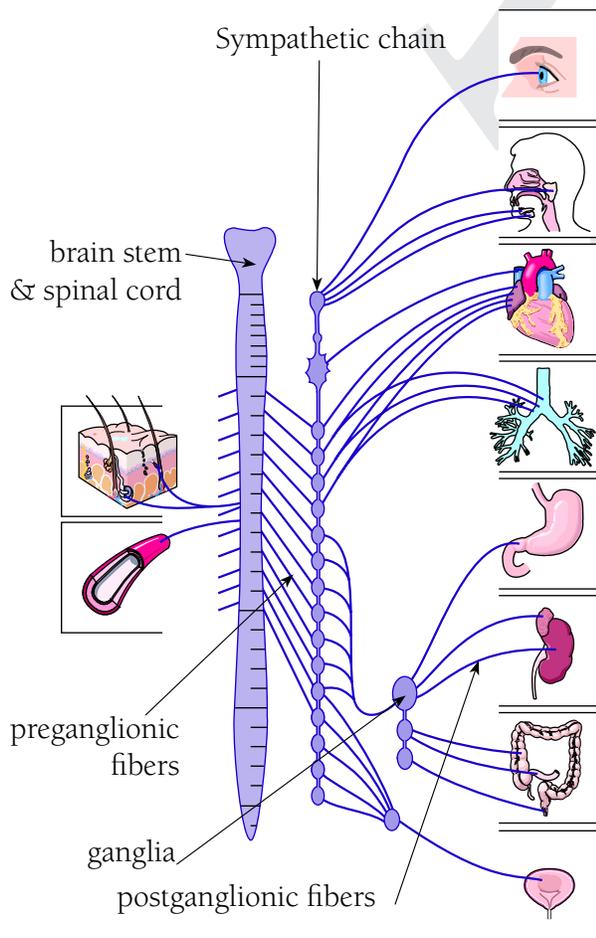
While the somatic nervous system requires conscious thought; the autonomic nervous system incorporating the sympathetic and parasympathetic systems, function independently and require no conscious thought. This system controls the action of the smooth muscles, cardiac muscles and various glands. They control such things as blood pressure, heart rate, body temperature and prepares the body for physical activity in the case of emotional or physical stress or hazard.

The sympathetic and parasympathetic systems work together and act as antagonists. In many organs there are dual innervations, impulses from one set of nerves will activate the action of some organs while the other set of neurons will inhibit the activity.

Unlike the somatic system where the axon of the motor neuron travels from the CNS through the PNS and extends directly to the motor neuron of the skeletal muscle, in the autonomic nervous system, there is always a synapse and an additional neuron between the CNS and the organ or gland. These additional neurons are called ganglionic neurons. These ganglionic neurons receive their stimulation from preganglionic neurons in the CNS. Axons of the ganglionic neurons leave the ganglia and innervate glands, organs, and cardiac muscle.

Sympathetic System

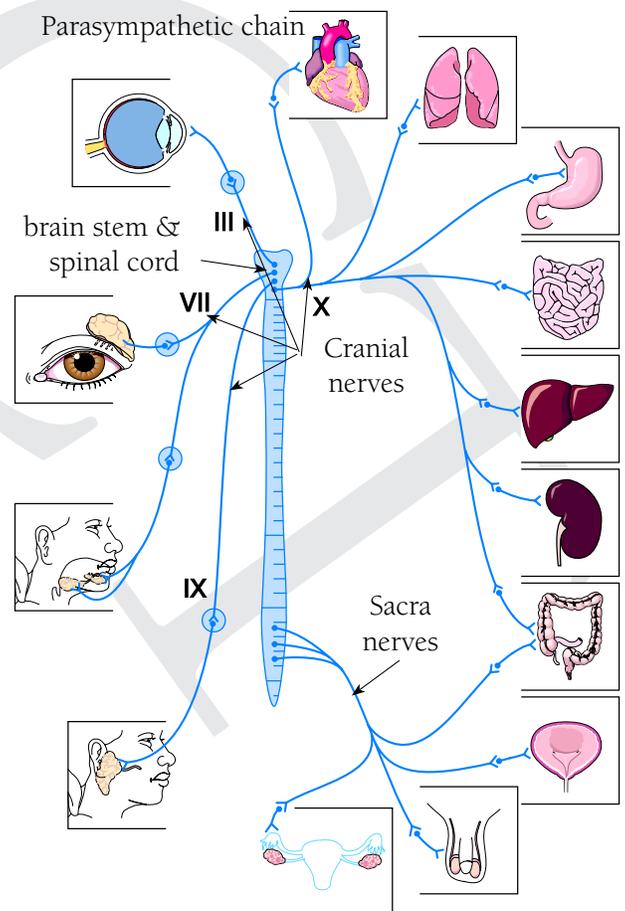
The sympathetic system is responsible for action, increasing alertness and preparing the body for emergency responses (“fight or flight”). The sympathetic system (or thoracolumbar system) have preganglionic fibers that originate from the lateral horn of the spinal cord from all thoracic neurons and the top two lumbar neurons (T1 through



L2). There are two types of sympathetic ganglia, paired and unpaired. The paired ganglia comprise the sympathetic trunk. There are three unpaired ganglia that are located in front of the vertebrae and stimulate the organs and tissues of the abdominal and pelvic cavity. These organs include the adrenals, the stomach, the small and large intestines and the bladder.

Parasympathetic System

The parasympathetic system is inhibitory in nature, to conserve energy and slow down the organs and tissues. The preganglionic fibers of the parasympathetic system originate in the midbrain, medulla oblongata, and the brain stem through cranial nerves III (oculomotor), VII (facial), IX (glossopharyngeal), and X (vagus); and also through sacral segments S2 to S4. The majority of the parasympathetic innervations comes through the vagus nerve which innervates approximately 3/4 of the parasympathetic actions including the



majority of the organs in the thoracic, abdominal, and pelvic cavities.

In particular, the parasympathetic system stimulates the motility of the small and large intestines, stimulates urination and defecation, stimulates the production of saliva, slows the heartbeat, and reduces blood pressure, just to name a few.

Special Senses

The special senses are sight/vision, hearing, taste, and smell. They also include the somatic senses, of pressure (heat, cold, pain, touch), and the sense of position or balance.

Somatic senses are the senses that have receptors that pick up information from the skin, muscles, joints, and the other visceral organs of the body. In some cases, these somatic senses operate as reflexes, which have been previously discussed. Other somatic senses rely on different types of receptors.

Chemoreceptors are associated with the sense of smell and taste. Pain receptors are associated with the detection of pain or damaged tissues. Thermoreceptors detect changes in temperature, heat receptors detect changes in temperature above the normal body temperature while cold receptors detect changes in temperature below the normal temperature of the body.

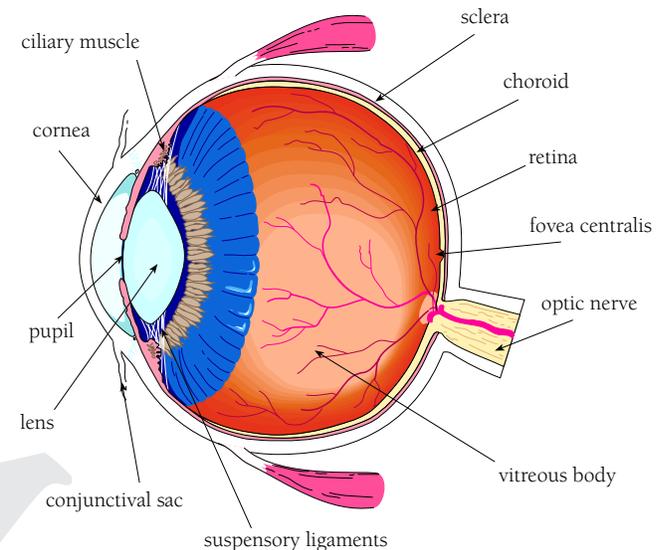
Mechanoreceptors detect a change in pressure or motion. One type, called a proprioceptor, detects changes in muscles and tendons, and signals a change in position or pressure.

Photoreceptors detect changes in the intensity of light and color and are found only in the eyes.

Vision

The sense of sight is performed primarily through the visual receptors of the eye while the

eye is protected by the eye lids and the tears from the lacrimal glands.



Light passes through eye and is refracted by four parts of the eye. The cornea is transparent and colorless, the aqueous humor is a watery fluid in front of lens. The crystalline lens is a clear firm circular structure and the vitreous body is a soft jellylike substance filling entire space behind the lens. Light strikes the retina. The retina has rods for night vision, and cones for day vision and for differentiating color.

Muscles of the eye adjust the iris of the eye. The iris is the colored and pigmented part of eye. The muscles adjust the size of the pupil, enlarging or dilating the pupil for night vision.

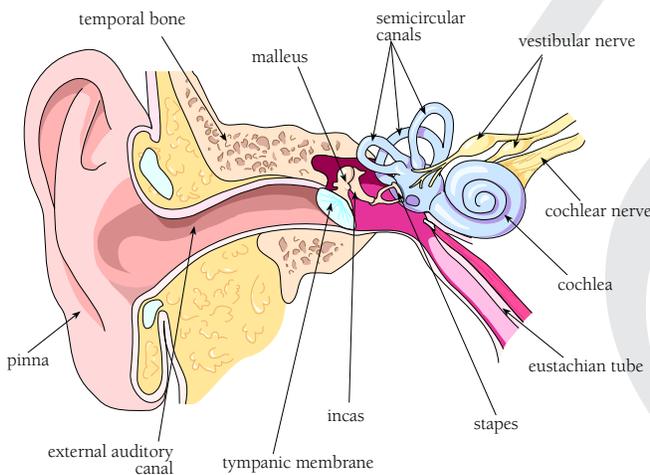
The optic nerve takes information from the rods and cones to the brain. The ophthalmic branch of the trigeminal nerve carries impulses of pain, touch, and temperature from the eye to the brain.

Hearing / Balance

Sound enters the ear through external auditory canal and travels to the tympanic membrane. The middle ear contains three bones or ossicles that amplifies sound as it transmit the sound to the transmits to perilymph.

The malleus is attached to the tympanic membrane, the incus located between the malleus and the stapes, and the stapes which transmits the sound vibration through a membrane to the fluid of the inner ear.

The inner ear is called the bony labyrinth also has three parts all containing perilymph. The vestibule which is located between the semicircular canals and the cochlea perform functions in both hearing and balance. The cochlea has the organ of Corti (the organ of hearing) at cochlear duct and transmits information through cochlear nerve to the brain. The semicircular canals are used in equilibrium and balance and work in conjunction with the proprioceptors located in the muscles and tendons of the body to transmit information through vestibular nerve. The vestibular nerve joins with cochlear nerve to form vestibulocochlear nerve.

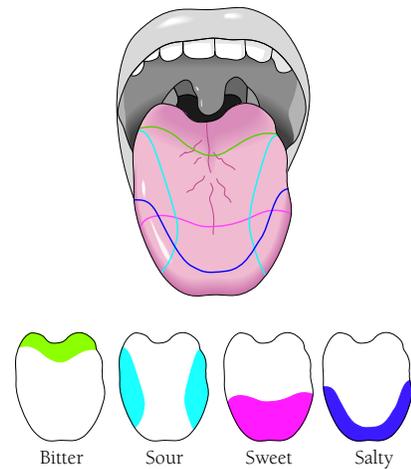


Taste

Taste buds are located along the edges of the tongue called fissures. Different tastes are detected on varying parts of the tongue. Sweet is depicted on the tip of the tongue, sour is best detected along the sides of the tongue, while the salty sensation is detected on the anterior sides of the tongue, and bitter tastes are generally detected on the back part of the tongue.

It has recently been determined that all taste buds can detect the primary taste of sweet, salt, bitter, sour. A new primary taste has been identified

by Japanese scientist called umami, which detects meaty or savory taste. Ref: 2007 Edition Anatomy & Physiology Jenkins, Kemnitz and Tortora

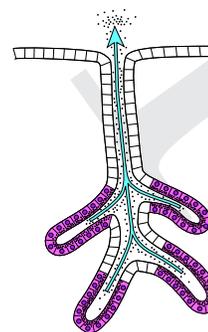


Smell

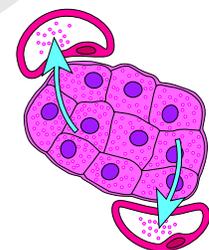
The olfactory epithelium holds the receptors for smell. These are located in the upper nasal cavity, once detected the information travels through the olfactory nerve to the brain. The sense of smell has greater detection capability than the sense of taste.

Endocrine System

The endocrine system works in concert with the nervous system to control the body activities allowing us to respond to internal and external changes. The nervous system provides the 'quick' responses while the endocrine system provides the mechanism for the slower and longer lasting responses resulting in the body achieving homeostasis.



Exocrine Gland: Secretes Substance onto a Surface, Usually Through a Duct



Endocrine Gland: Secretes Substance into the Bloodstream

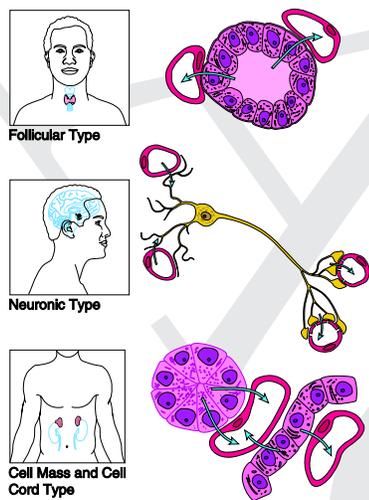
The endocrine system functions by causing endocrine cells or glands to secrete hormones into body fluids such as the blood stream. On the other hand, exocrine cells secrete fluid through ducts to specific organs or body tissues.

Endocrine glands/organs include the hypothalamus, the pineal gland, the pituitary gland, the parathyroid gland, the thyroid gland, the thymus, the adrenal glands, the kidneys, the pancreas, the ovaries, and the testes.

These glands/organs produce amino acid based hormones and also lipid based hormones.

The majority of the endocrine system is amino acid based while the reproductive organs and adrenals are steroid based. Lipid based hormones include both steroid hormones and prostaglandins which have a regulatory action on the cells.

Types of Endocrine Glands

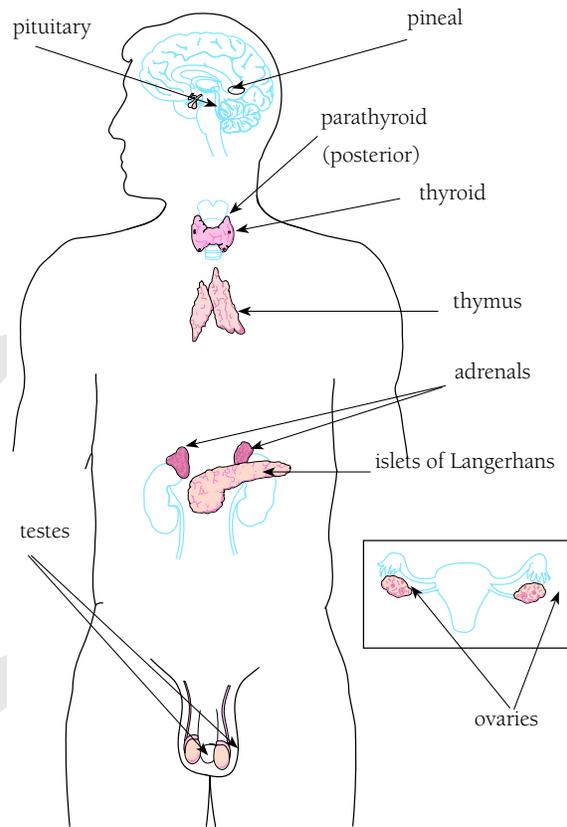


The hormones act on tissue called target tissue which have receptors that the hormones attach to.

The action of the hormones is controlled through a negative feedback system. In this system, endocrine gland which make up the hormone secreting cells provide hormones to the tissue. When the tissue become concentrated with the hormones at a certain level, a signal is sent and the action of the endocrine gland is inhibited. As the concentration of the hormone in the target tissue decreases, then the signal to inhibit the endocrine gland stops, and the gland starts production of the hormone once again. As a result of this negative feedback system, the concentration of hormones in the target tissues remains relatively stable.

The pituitary gland is called the master gland and controls the other glands. It is connected to brain at the hypothalamus by the pituitary stalk, the infundibulum.

Endocrine Glands



The pituitary has two lobes, the anterior lobe and the posterior lobe.

The anterior lobe produces the following hormones:

- Growth Hormone (GH) (somatotropin) which is essential for growth.
- Thyroid-stimulating hormone (TSH) (thyrotropin) which is responsible for stimulating the thyroid gland.
- Adrenocorticotrophic hormone (ACTH) stimulates the cortex of the adrenal glands.
- Prolactin (PRL) stimulates production of milk in the female.
- Gonadotropins are the hormones that acting on the gonads
- Follicle-stimulating hormone (FSH) is

responsible for the development of eggs in ovaries & the sperm in the testes

- Luteinizing hormone (LH) is responsible for ovulation in females, and sex hormone secretion in both males and females

The posterior lobe produces the following hormones:

- Antidiuretic hormone (ADH) promotes reabsorption of water from the kidney tubule and causes contraction of smooth muscle of blood vessel which in turn raises the blood pressure. Inadequate ADH causes an excessive loss of water through the kidneys.

- Oxytocin is responsible for contraction of muscle in uterus, and milk ejection from breasts after pregnancy.

The thyroid gland which is located in the neck has two lateral lobes and must have iodine available to function properly. It produces:

- Thyroxine which increases metabolism.
- Calcitonin which is useful in metabolizing calcium.

The parathyroid glands which are four tiny bodies behind the thyroid gland, produce:

- Parathyroid hormone (PTH) which regulates calcium metabolism.

The adrenal glands are two small glands located above the kidneys. They are comprised of two parts, an inner medulla and an outer cortex. The medulla produces the fight or flight hormones:

- Epinephrine, a neurotransmitter called adrenaline
- Norepinephrine also called noradrenaline

The adrenal cortex of the kidneys produce:

- Glucocorticoids which maintain the carbohydrate reserves. The main one is cortisol, which converts amino acids into sugar.

- Mineralocorticoids which regulate the electrolyte balance. The primary hormone is aldosterone.

- Adrenal sex hormones are produced in both sexes, but the function is not known.

The pancreas more appropriately, the endocrine portion of pancreas contains islets called the islets of Langerhans.

- These produce insulin which helps transport glucose across the cell membranes, increases transport of amino acids into the cells helping to improve the manufacture of protein and increases the rate at which liver can change excess sugar into fatty acids for storage in fat cells.

- Produces glucagon which works with insulin and regulates blood sugar levels and it increases the rate at which glucose is made.

The sex glands are the ovaries of the female and testes of the male. These produce sex cells used in development of sexual characteristics. The male hormone is testosterone and the primary female hormone is estrogen. Progesterone is beneficial in normal development during pregnancy.

The thymus gland is a mass of lymphoid tissue which lies in the upper part of chest, just above the heart. It produces:

- Thymosin which assists in producing T-lymphocytes.

The pineal body is a small flattened cone-shaped structure located posterior to the mid brain. It produces melatonin (produced during dark periods of the day) which helps to regulate the sleep - wake cycle.

There are other hormones in the lining of stomach & small intestines which regulate digestive juices.

The kidneys produce a hormone called renin which regulates blood vessel constriction and also produces erythropoietin which stimulates red blood cell production in the red bone marrow. Finally the atria of the heart produce atrial natriuretic peptide which assist in lowering blood pressure.

The Cardiovascular System

The Cardiovascular System is comprised of blood, heart and the blood vessels. Its purpose is to supply the body with oxygen and nutrients, and carry away waste products and toxins.

The Blood

Specific functions of the blood include:

- Transport - carries water, oxygen and food to all areas of the body and carries away carbon dioxide and waste products
- Protection - prevents hemorrhaging/bleeding thru coagulation (clotting) and aids in protecting the body from harmful bacteria through the white cells.
- Regulation - helps to equalize the body temperature.

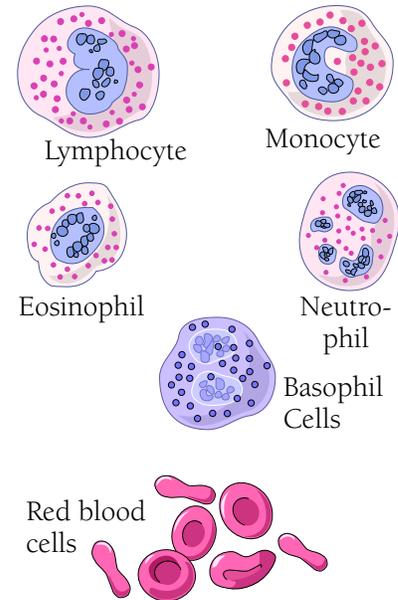
The blood is comprised of a fluid component (blood plasma) which. The solid components of the blood are red corpuscles, white corpuscles, and the platelets.

Plasma is the fluid part of blood which has a straw like color. The plasma suspends the platelets, red and white corpuscles. Plasma is made up of approximately 90% water, 7% is protein which is an important part of cytoplasm, the rebuilding body tissues. The albumin in the plasma maintains the osmotic pressure of the blood. The plasma regulates the pH balance and fluid balance and transports nutrients and gasses throughout the body

The red corpuscles or erythrocytes are double concave disc-shaped cells which are colored red by the hemoglobin in the cells. They function to carry oxygen from the lungs to body cells and transports carbon dioxide from cells to the lungs so it can be removed from the body. Red cells are produced in the red bone marrow and cannot leave blood vessels. Red cells make up approximately 98% of all blood cells.

The white cells or white corpuscles called leukocytes are larger than red blood cells and are colorless. These cells can change size and shape depending on

their location and function. They are produced in the spleen, lymph nodes, and red bone marrow, but unlike the red cells which are restricted to the blood vessels, white cells can squeeze between cells and move through intercellular space in an amoeba-like motion to help protect the body against disease.



In this function, the white cells provide an important part of immune system. Through a process called phagocytosis, the white cells engulf harmful bacteria or particles and then digests them.

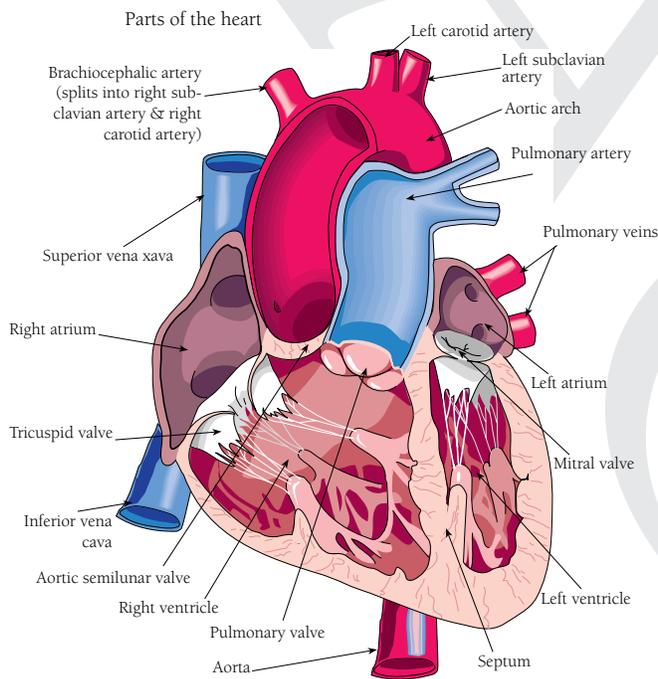
Platelets, also called thrombocytes, are colorless, irregular shaped bodies that are much smaller than red corpuscles. They are also formed in red bone marrow and function in clotting the blood after a wound.

The blood clotting process is worth review. In a resting state, there is a balance between the procoagulants, the compound that promotes clotting, and the anticoagulants that prevents clotting. After an injury, the procoagulants are activated and a clot formed. The injured tissue releases thromboplastin which is the trigger mechanism which reacts with certain protein factors and calcium to form prothrombin. Prothrombin reacts with calcium ions and forms thrombin which converts fibrinogen into insoluble fibrin. Fibrin forms a network of threads entrapping red blood cells and platelets which form a clot. At this point,

the platelets release serotonin (a vasoconstrictor) which constricts the vessel in an effort to reduce blood loss.

Heart

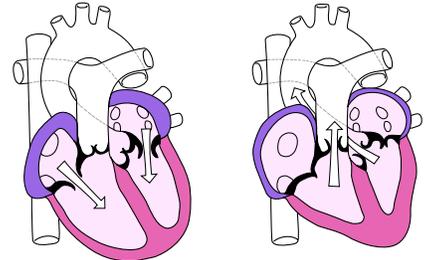
The heart is a muscular pump for circulating the blood. It is formed of three layers of tissue; the endocardium lines the interior of the heart and is made up of a thin, smooth layer of squamous epithelium tissue. The myocardium is the cardiac muscle, responsible for the pumping action of the heart and is the thickest layer, lightly of striated heart muscles. The epicardium is the thin outermost, serous lining layer of the hear which encloses the heart.



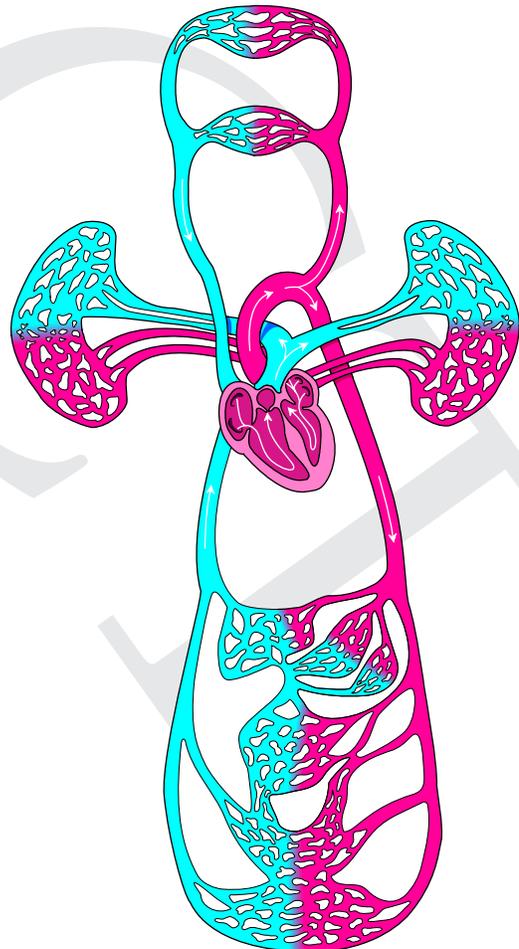
The pericardial cavity is comprised of the pericardium, which is comprised of the epicardium and contains a serous fluid that supports the heart, and allows the heart to beat or move without friction. The outer layer of the pericardium is called the parietal pericardium and attaches the heart to the diaphragm, vertebral column, and back of the sternum.

The heart generates its pump action in the

following manner. Venous blood, (blood low in oxygen, and high in carbon dioxide) enters the right atrium through the superior and inferior vena cava. As the right atrium contracts, the blood is forced through the right atrioventricular (tricuspid) valve into the right ventricle. When the right ventricle is compressed, blood flows through the pulmonary semilunar valve into the pulmonary artery. This is the only artery that does not carry oxygenated blood. The blood flows into the lungs where the carbon dioxide is exchanged for oxygen.



The oxygenated blood then flows from the lungs, through the pulmonary vein (this is the only vein that carries oxygenated blood) into the left



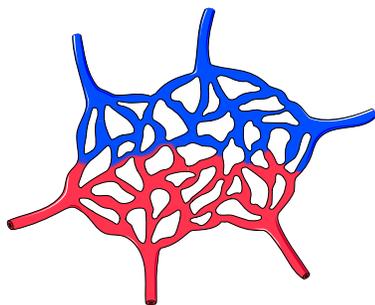
atrium. The left atrium pumps the blood through the left atrioventricular (bicuspid) valve into the left ventricle. Finally, when the left ventricle compresses, the blood flows through the aortic semi-lunar valve into aortic arch, where the oxygenated blood will flow under pressure to the arteries of the body.

During normal function, blood pressure is registered as a systolic pressure (muscle contraction) which averages 120 mm Hg, and is determined by the strength of the contraction of the heart, and the total blood volume that each beat pushes out. The diastolic pressure or heart relaxation, averages 80 mm Hg. This registers the vasomotor change. Vasoconstriction increases resistance of the flow and vasodilation lowers resistance. Another factor for the diastolic pressure is the elasticity of blood vessels and the thickness or viscosity of the blood. An increased number of red blood cells increases blood viscosity.

Blood Vessels

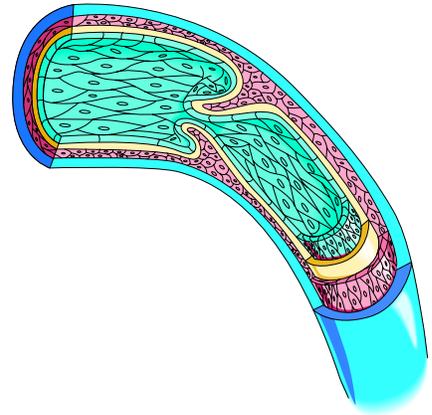
The vessels of the blood are the arteries and arterioles which transports oxygenated blood (except the pulmonary artery) to the body. Arteries are thick walled and muscular. The main artery is the aorta which travels from the left ventricle of the heart and extends over and down the vertebral column. Arteries continue to branch into smaller arteries until they become microscopic arterioles.

From the arterioles the blood flows through capillaries which are the smallest microscopic, thin walled vessels which connects small arterioles with venules. Capillaries include a two-way transport of substances, through a process called diffusion, between the flowing blood and tissue fluids.

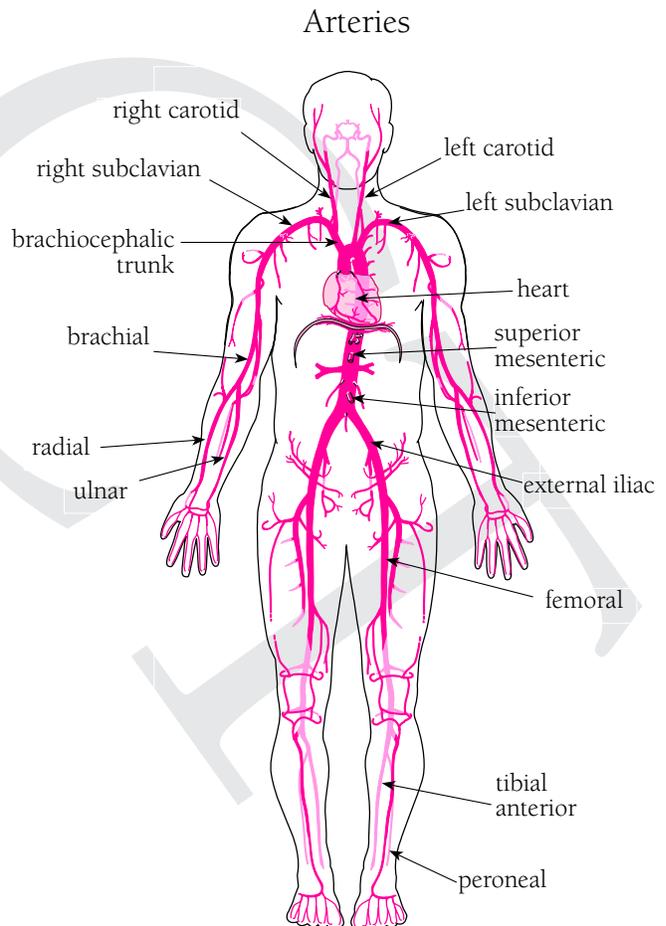


From the capillaries, the blood flows through

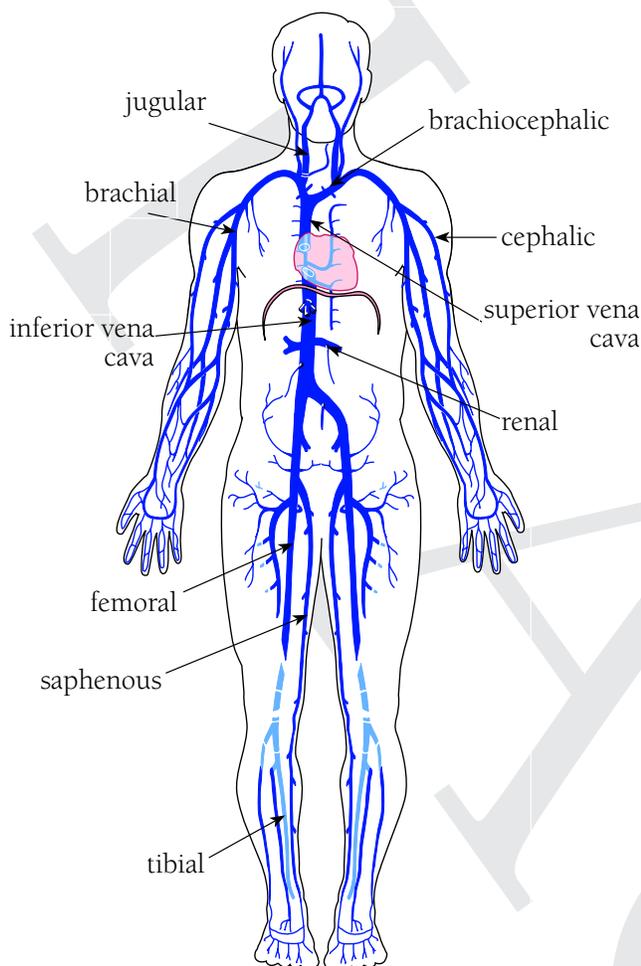
the veins and venules. Venules are the microscopic vessels that run from capillaries to veins. The veins carry deoxygenated blood and waste laden blood from the various capillaries back to the heart. The veins are thin-walled vessels with a system of valves that prevent blood from flowing backward called a venous pump.



The arteries and veins are generally named by the location of the major bones in the area.



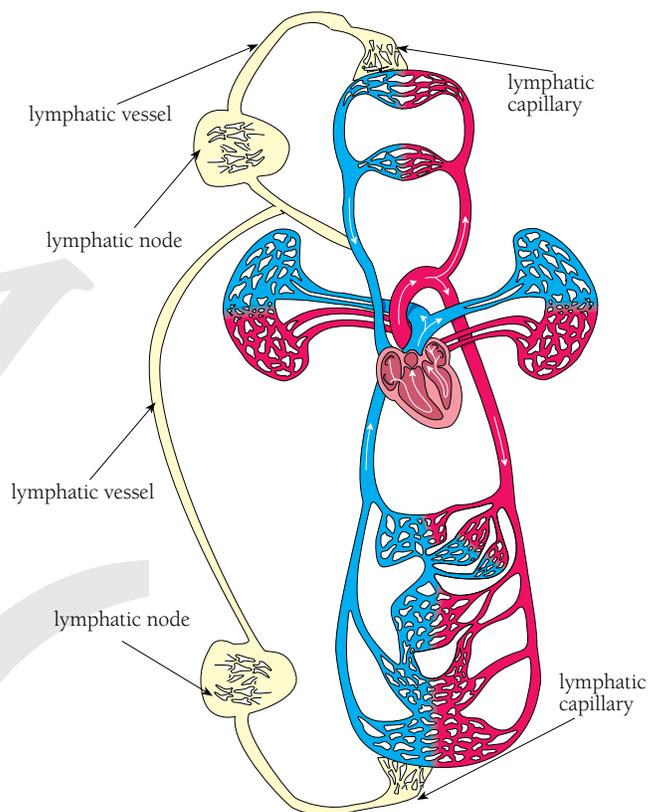
Veins



tissue fluid enters the lymph system, the remaining tissue fluid flows back through the blood system.

The lymphatic system is located throughout body, however, it is not in the epidermis of skin, nor in the endomysium of the muscle.

Lymphatic system flow



The Lymphatic System

The lymphatic system may be considered the second part of the circulatory system, the blood or cardiovascular system is the other part.

The lymph system includes the lymph, lymph ducts, tonsils, spleen and thymus gland.

The lymphatic system is comprised of lymphatic vessels and lymphatic capillaries that drains away excess tissue fluid that does not return through the blood capillaries. Lymph fluid also absorbs protein from the tissue and returns it back to the blood stream; traps and destroys bacteria and other foreign particles.

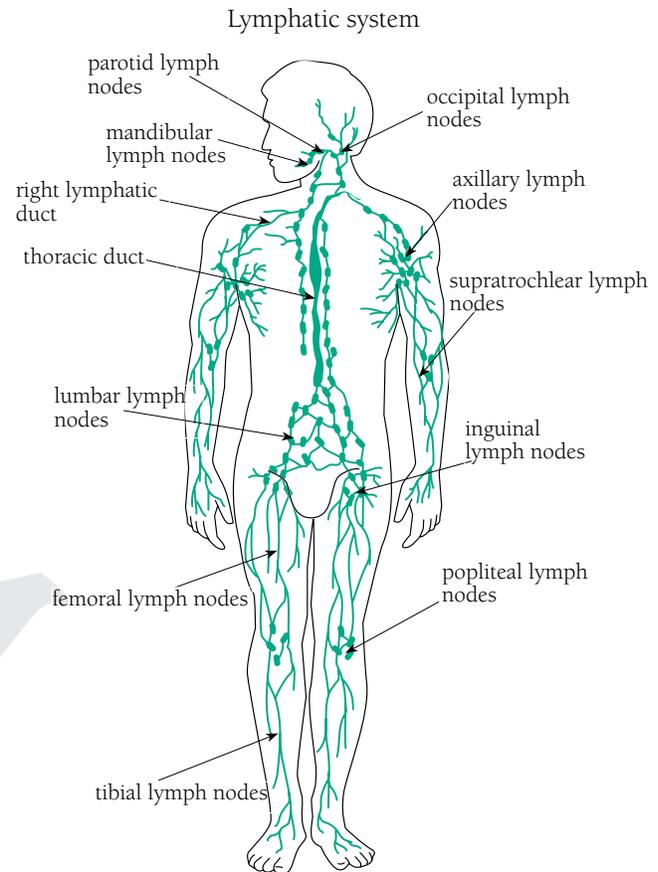
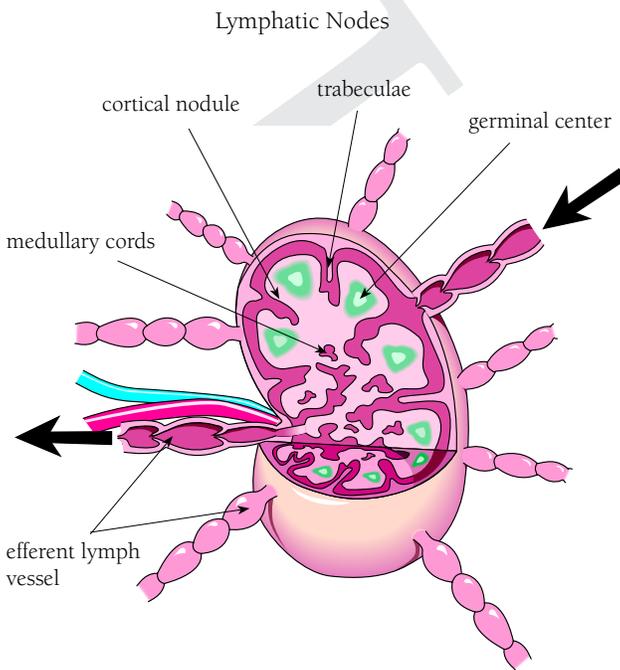
Lymph fluid is a straw colored tissue fluid when it is in the lymph system. Only about 10% of

Lymph capillaries called lacteals are in the villi of stomach and have a flap like valve arrangement to keep flow of lymph fluid one way.

There are two separate lymph ducts in the lymph system. The right lymphatic duct for lymph collection is only 1/2" long and collects lymph from right side of head, neck, thorax and upper right extremity. The right lymphatic duct feeds lymph into blood stream at the right subclavian vein.

The thoracic duct for lymph collection is 16 " long and receives lymph from all parts of body except the parts that feed the right lymphatic duct.

The thoracic duct feeds lymph into blood stream at left subclavian vein.



Like the venous system, there is no internal pressure in the lymphatic system, therefore there exists a lymphatic pump which requires muscle contraction for action, similar to the venous pump) that moves lymph fluid in the lymphatic system.

The lymph tissue acts like an oil filter in an automobile cleaning the lymph fluid as it moves through the lymph nodes in support of the immune system. Following is a list of some of the lymph nodes:

- Cervical nodes located in the neck
- Axillary nodes located in arm pits
- Tracheobronchial nodes located in trachea and bronchial tubes
- Mesenteric nodes located between peritoneum that forms mesentery
- Inguinal nodes located in groin
- Submandibular nodes located beneath mandible
- occipital nodes located at base of skull
- popliteal nodes located behind the knee
- Mammary nodes located in the breast
- Tibial nodes located in the leg
- Femoral nodes located in the thigh

Additional lymphatic tissues include, the tonsils, the thymus, and the spleen.

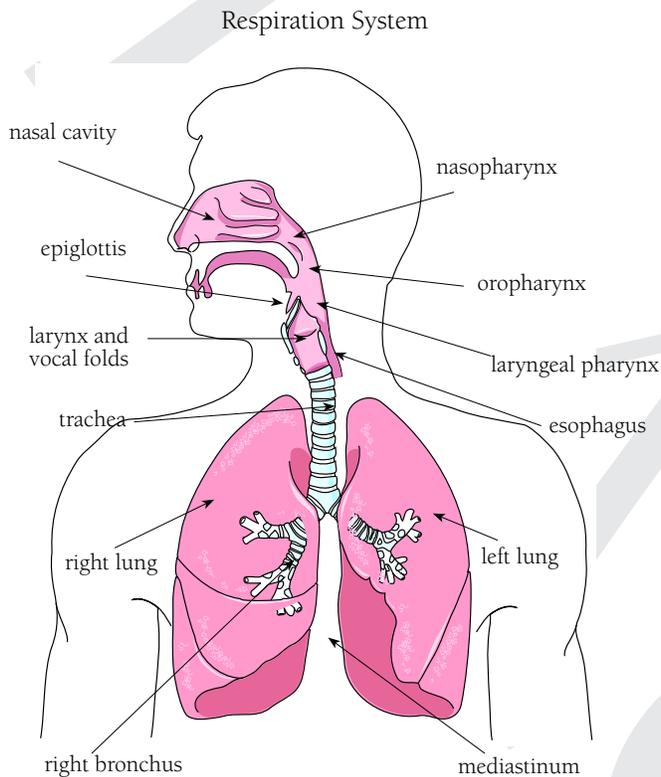
The tonsils are comprised of three separate tissues. The palatine tonsils which are located at each side of soft palate, the pharyngeal tonsils sometimes called the adenoids are located behind the nose on upper pharynx, and the lingual tonsils which are little mounds of lymph tissue on back of tongue.

The thymus is located on the upper thorax beneath the sternum produces thymosin which helps develop T-lymphocytes in thymus

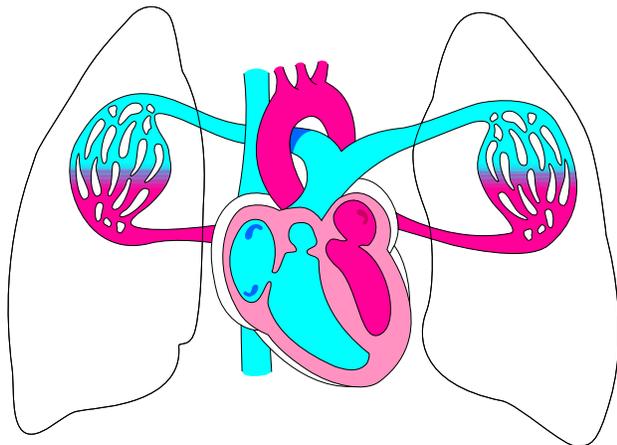
The spleen is the largest of the lymphatic organs and serves four functions. It is designed to filter the blood; destroys old, worn-out red blood cells; produces red blood cells before birth; and serves as a reservoir for blood, in case of emergency.

Respiratory System

The respiratory system is comprised of the nasal cavities, the pharynx, the larynx, the trachea and the lungs.



It serves the function of obtaining oxygen from the environment through three phases. The first phase is pulmonary ventilation, or the exchange of air between the atmosphere and air sacs of lung; phase two is diffusion or the passages of oxygen from the air sacs into the blood, and the passage of carbon dioxide out of the blood into



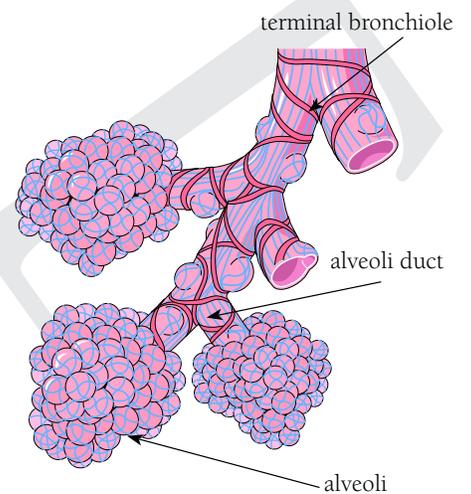
the air, and finally, the third phase is transport or circulation of the blood to provide oxygen to the cells and remove carbon dioxide from the cells and transport it back to the lungs.

The nasal cavities function by allowing air to enter through nostrils, air enters into two nasal cavities that are separated by the nasal septum. In the nose, air undergoes three protective changes; first, foreign particles are filtered out by hairs of nostrils, next the air is warmed, and finally, the air is moistened. Air breathed in through mouth does not get the same benefits.

The pharynx carries air into the respiratory tract and has three (3) portions: the nasopharynx is the upper portion behind nasal cavity, the oropharynx is the middle section behind the mouth the lowest portion is the laryngeal pharynx which opens toward the larynx to the front and opens into the esophagus toward the back of the larynx. The voice box upper portion has the vocal cords and is located between the pharynx and the trachea. The space between cords is called the glottis. The epiglottis is a leaf shaped cartilage that covers the larynx during swallowing.

The trachea is the tube from larynx to the upper part of the chest which conducts air between the larynx and the lungs.

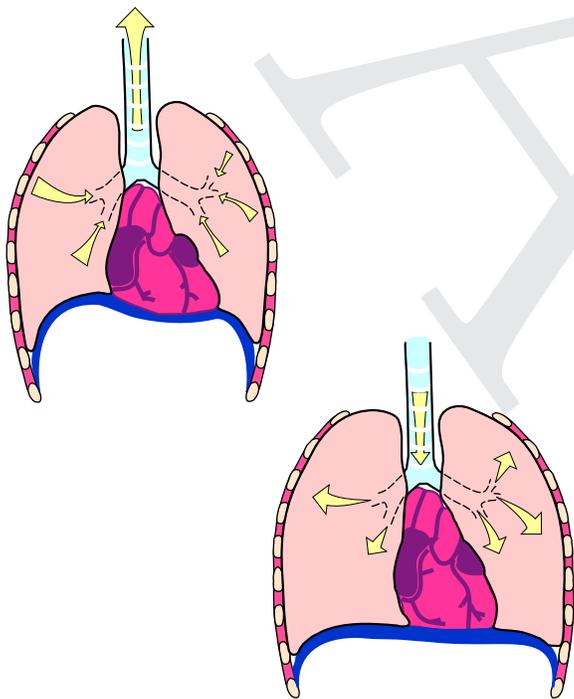
The lungs include the bronchial tree, a larger divisions of the bronchi; the bronchioles which are the smallest division of bronchial tree, the terminal bronchioles which are a cluster of tiny air sacs where gas exchange occurs; and the alveoli or air sacs which are a single



layer of squamous (flat) tissue. Some cells in the alveoli produce a surfactant which prevents the alveolar wall from collapsing due to air pressure.

Normal breathing includes inhalation or drawing air into the lungs and exhalation which allows the air to leave the lungs.

During inhalation, the diaphragm contracts, the external intercostal muscles raise the ribs; the thoracic cavity increases in size which causes the gas pressure in lungs to decrease allowing air to then enter the lungs.



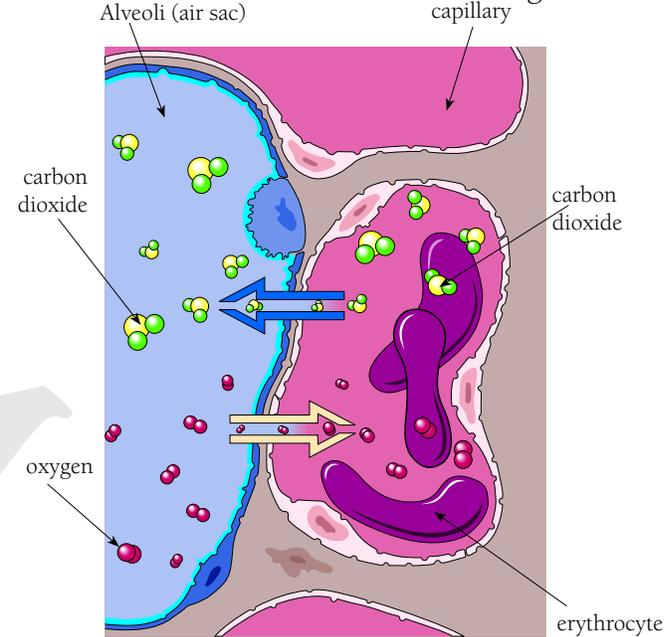
Exhalation is accomplished as the muscles relax allowing the ribs and diaphragm to return to their normal position which allows air to leave the lungs.

Under a forced exhalation, the internal intercostal muscles, and the muscles of abdomen contract, pulling down the rib cage and pulling the abdominal tissue in toward lungs which force the air to leave the lungs.

Gas exchange includes the transport of oxygen from the atmosphere to the lungs and

the blood and carbon dioxide transport from the bloodstream to the atmosphere

As oxygen is brought into the lungs, and comes in contact with the blood through the al-



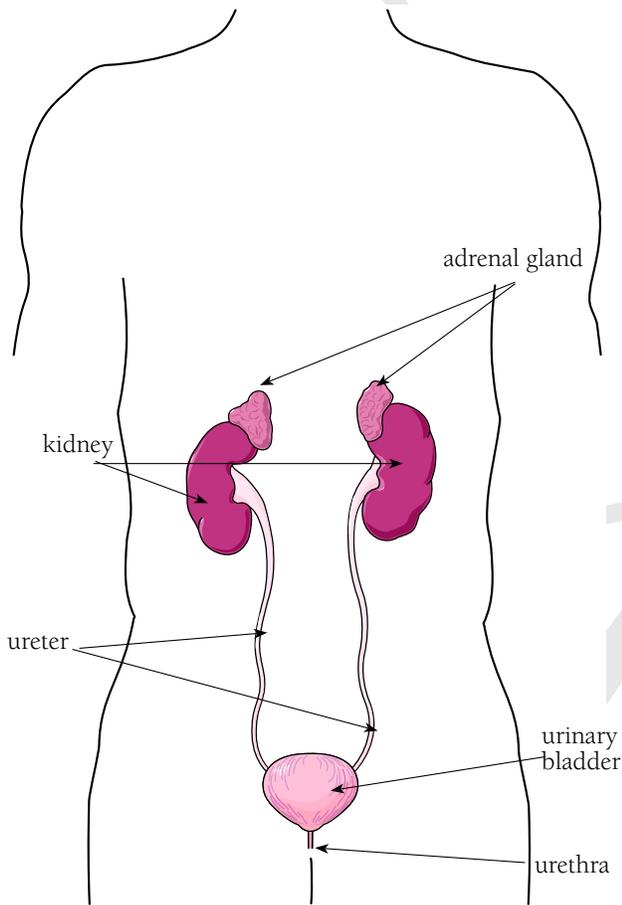
veoli, the hemoglobin in the blood binds with the oxygen and then is carried to the body tissues. The lower the concentration of oxygen in the tissues of the body, the higher the amount of oxygen that will be released by the hemoglobin into the tissues.

Carbon dioxide from the tissue enters the molecules of the bloodstream and are transported to the lungs in three ways. A small proportion (less than 10%) is dissolved in the blood plasma, approximately 20% is bound by the hemoglobin, and the remainder is converted into bicarbonate ion; however in all cases, the carbon dioxide is eventually released in the alveoli transfer.

Urinary System

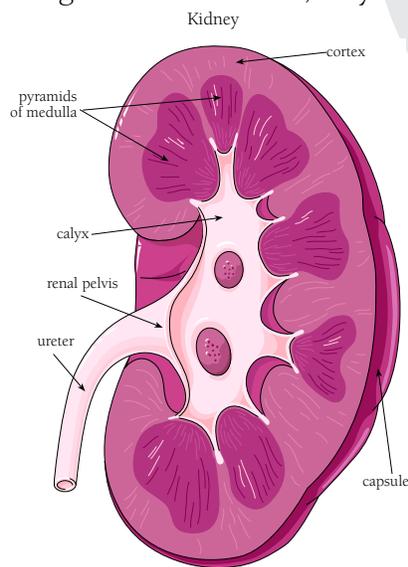
The urinary system is comprised of two kidneys, 2 ureters, one urinary bladder, and one urethra and serves two primary functions, first to excrete water and second to excrete waste products containing nitrogen and salts.

Urinary System

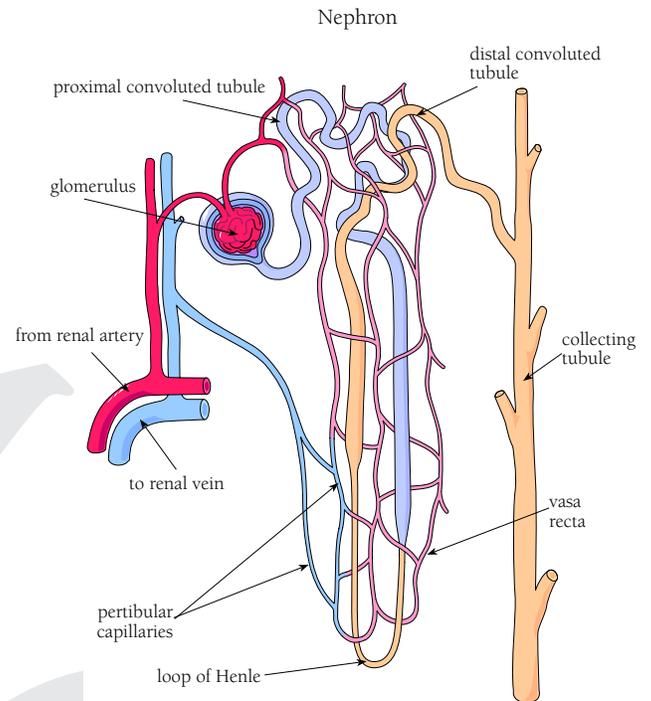


The kidneys excrete unwanted substances such as waste products from cell metabolism, excess salts, and toxins. They provide a primary function of maintaining the water balance, they act to regulate the acid-base balance of the body, and they produce the hormone renin which is used to regulate blood pressure.

Located inside the kidney is the nephron which is a tiny coiled tube with a bulb at the end called the Bowman's capsule.



The Bowman's capsule surrounds capillaries called glomerulus. There are over one million nephrons in the kidney which filters forty - fifty gallons of blood plasma each day.



The bladder functions as a reservoir for the urine. The urine is carried to the bladder from kidneys by the ureters. When the bladder has approximately 1 pint of urine in it, sensors indicate it is time to urinate. During the voiding process there is a voluntary relaxation of a sphincter muscle at the mouth of the urethra which results in an involuntary contraction of the muscles of the bladder. The urine is then forced through the urethra out of the body.

Reproductive System

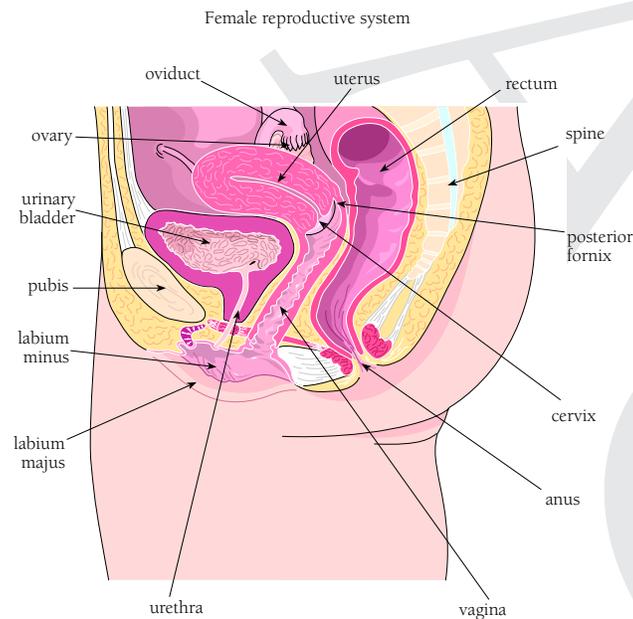
The function of the reproductive system is to reproduce.

The reproductive organs in the female are called the ovaries which produce cells called ova. In the male, the reproductive organs are called the testes which produce cells called spermatozoa. In addition to the ovaries and the testes, there are ducts for the transport of the cells and various exo-

ocrine glands which support the reproductive process.

The female reproductive system functions to produce ovum which produce female hormones. It functions to perform the sex act and receive the sperm, and it carries the fetus during pregnancy.

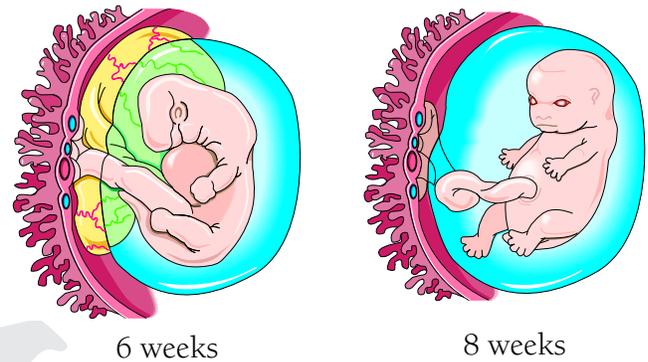
The parts of the female reproductive system are the vagina which leads to the cervix (the lower part of the birth canal), the uterus which holds the fetus during pregnancy, the oviducts or fallopian tubes which carry the egg to the uterus, and the ovaries which produce the ovum and produce the sex hormones estrogen and progesterone.



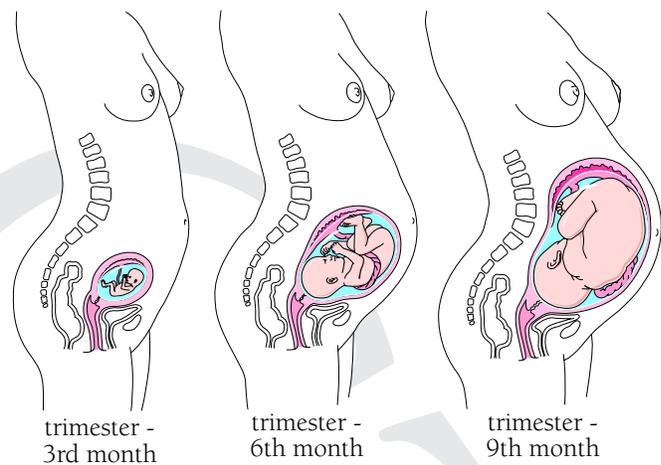
The reproductive process starts with the menstrual cycle when a follicle develops in the ovary and produces estrogen as the ovum matures. During ovulation, the mature ovum is discharged from the follicle, the pituitary gland produces a luteinizing hormone which changes the follicle to a corpus luteum. The ovum travels to the uterus, where when it is fertilized, pregnancy occurs. If the ovum is not fertilized, the lining of the uterus sloughs off and is expelled.

To support the fetus, the mother's metabolism undergoes many changes. The heart must pump more blood, the lungs must supply more ox-

xygen, the kidneys must excrete more nitrogenous waste from both fetus and mother, and the nutritional needs increase to support growth in maternal organs (uterus and breasts) and supports the growth of the fetus. The mother's body prepares for labor and the secretion of milk after birth.

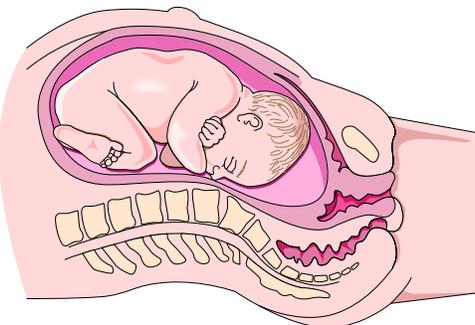


There are four stages of the birth process.



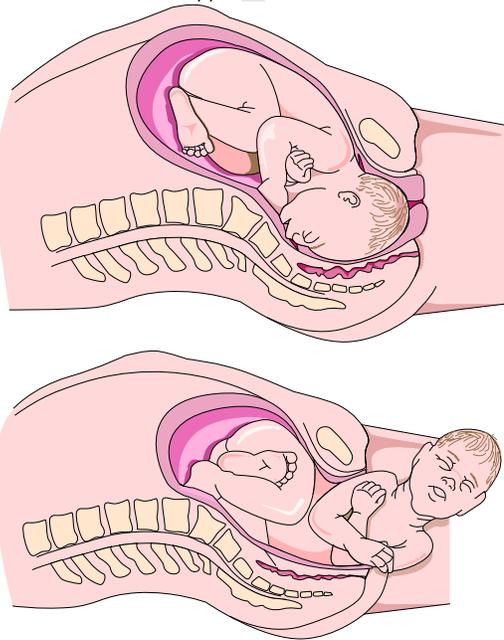
The 1st stage is the regular onset of contractions, the cervix becomes thinner, the amniotic sac ruptures and fluid gushes from vagina.

Next, during the 2nd stage, the cervix becomes completely dilated and the baby is



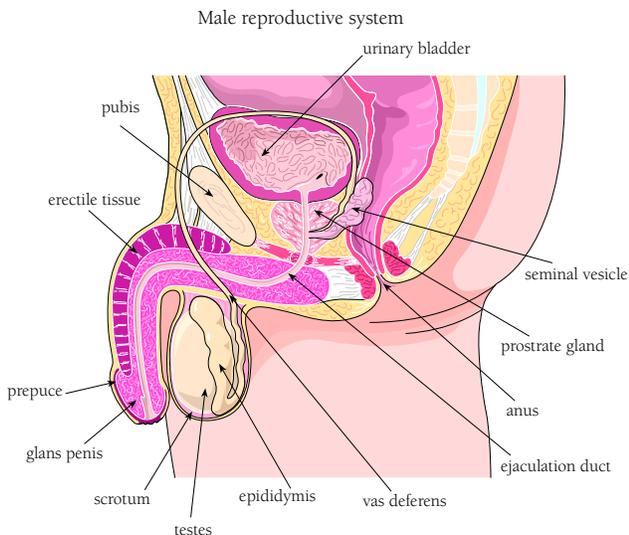
born. The 3rd stage begins immediately after the child is born and this stage ends after the after-birth is expelled.

The after-birth includes the placenta, amniotic sac and umbilical cord. The 4th stage begins after the after-birth is expelled, bleeding is controlled as the uterine muscles contract and closes off the blood vessels.



The male reproductive system functions to produce sperm, it produces the male hormones, and performs the sex act.

The parts of the male reproductive system includes the scrotum which holds the testes, the testes produce spermatozoa, the epididymis stores sperm until fully mature extends upward to vas deferens. The vas deferens joins with seminal vesicle ducts to form the ejaculatory duct.

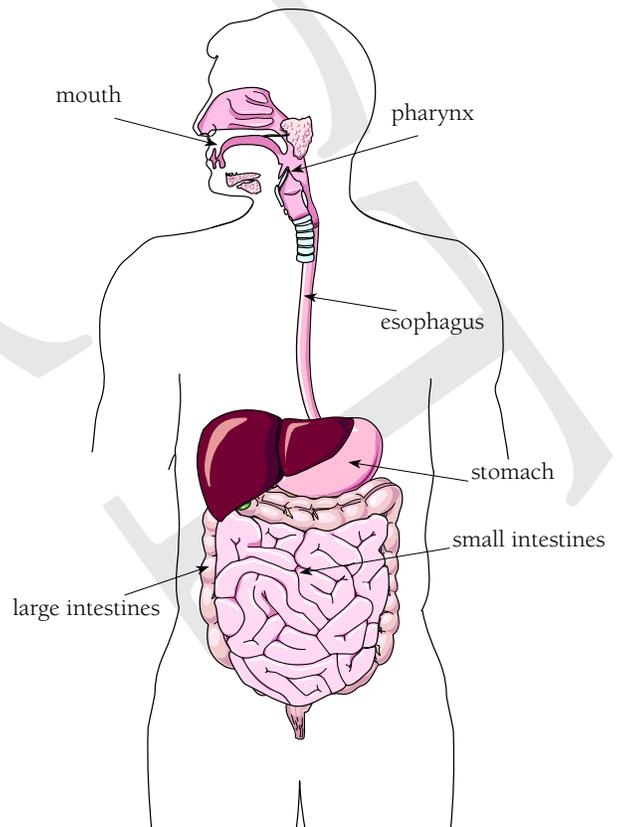


The male reproductive system accessory glands produce secretions that join with sperm to form semen, the seminal vesicles produce seminal fluid to nourish and protect the sperm. The prostate gland secretes alkaline fluid to enhance the sperm's mobility and protect the sperm as it travels up the vagina.

Digestive System

The digestive system is designed to digest the food so the nutrients can be converted into substances capable of being used by the cells for nourishment, and then the food must be absorbed which is the process where the digested nutrients are transferred from the intestines to the blood or lymph vessels so that they can be transported to the cells.

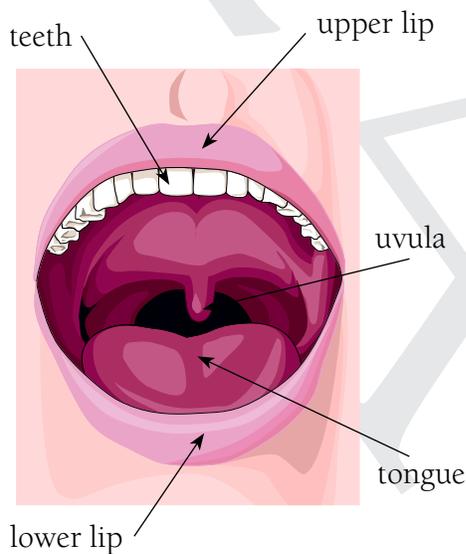
The digestive system is comprised of the alimentary canal consisting of the mouth or oral cavity, the throat or pharynx, the esophagus, the stomach, the small intestines, and the large intestines; and the accessory digestive organs comprised of



the teeth, the tongue, the salivary glands, the pancreas, the liver, and the gall bladder.

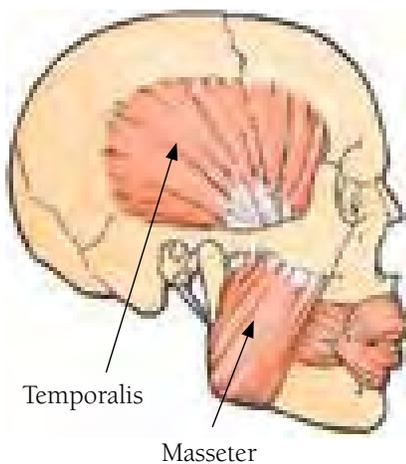
This section will review in detail the parts of the alimentary tract, and will discuss the muscles, and innervations that effect each organ in the tract.

The first part of the alimentary canal is the mouth, which starts the mechanical breakdown of non-liquid foods through a process of mastication as the teeth grind the food and mixes the food with saliva.

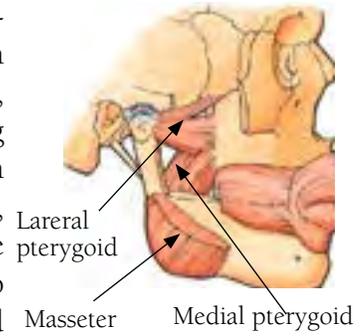


There are three sets of muscles that cause the jaw to close and assist in mastication or chewing food, and one set of muscles assists gravity in opening the jaw.

The masseter, the temporalis and the internal (or medial) pterygoid are responsible for closing the jaw with force while the ex-



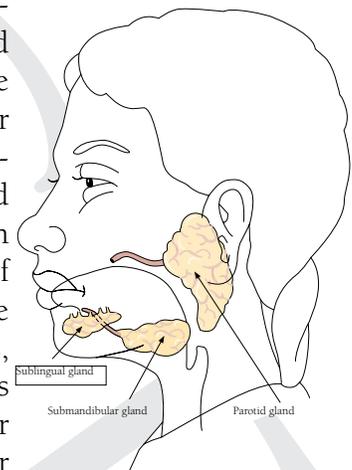
ternal (or lateral) pterygoid muscle assists in opening the mouth, and by stimulating one side of the mouth and then the other, the mandible can be moved side to side to assist in grinding and chewing the food.



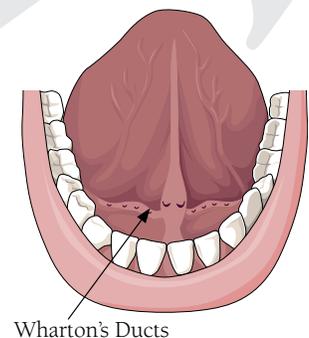
Another muscle assists in mastication, and that muscle is the buccinator, located in the cheeks, assists in holding food in proximity to the teeth during chewing.

The teeth are the grinding stones that perform the actual process of chewing. Saliva contains enzymes called salivary amylase or ptyalin that start to breakdown carbohydrates. The food is turned into a soft ball called bolus.

There are three sets of salivary glands, the parotid, which is located below the ear and between the skin of the cheek and the masseter muscle; the submandibular glands are located in the floor of the mouth on the inside surface of the mandible; and the smallest salivary glands, the sublingual glands which are located under the tongue on the floor of the mouth.

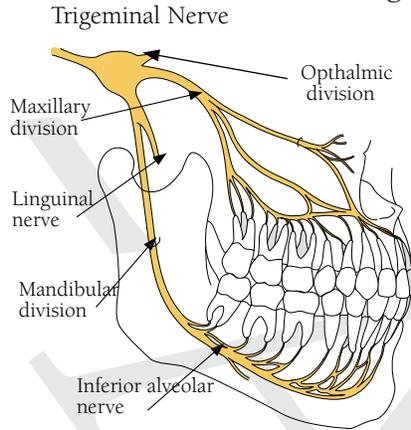


The submandibular glands excrete saliva under the tongue through ducts called Wharton's ducts.



Saliva is made up of 99.5% water and salivary amylase (ptyalin) which starts the breaks down of carbohydrates.

The fourth cranial nerve, the trigeminal nerve provided the innervations for mastication. The trigeminal nerve breaks down into three large branches. The maxillary division innervates the maxilla, the ophthalmic division innervates the lacrimal glands and the surface of the eye. The mandibular division breaks into two sections, the lingual nerve, innervates the tongue and the inferior alveolar division innervates the mandible.

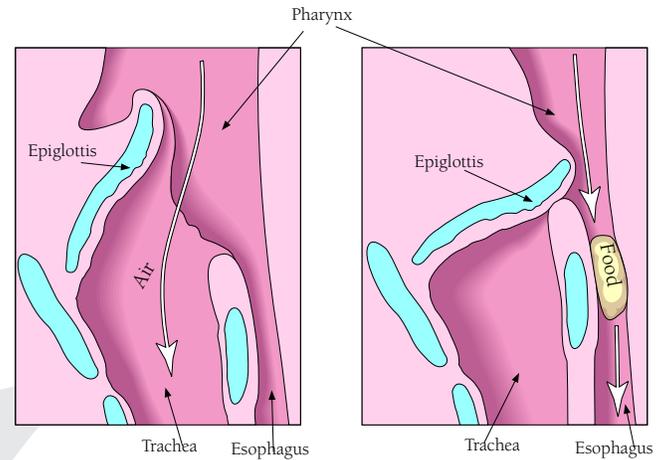


The seventh pair of cranial nerves, the facial nerve, and the ninth pair of cranial nerves, the glossopharyngeal nerves are responsible for taste and the output of saliva. The facial nerves innervates the anterior two-thirds of the tongue while the glossopharyngeal nerves innervate the last third of the tongue and the pharynx.

The arteries that supply the tongue are the lingual arteries while the muscles and skin of the face are fed by the facial artery. Each external carotid artery splits into a maxillary artery that feeds the upper and lower jaw and the chewing muscles; and into a superficial temporal artery that supplies blood to the parotid salivary gland and the scalp.

The tongue forces food toward the pharynx which starts the three stages of swallowing. After the food is forced into the pharynx, it passes from the pharynx to the esophagus. The pharynx nerve is stimulated to close the epiglottis, blocking the trachea, the eustachian tube; and opening the posterior opening of nasopharynx. The tongue is pressed posteriorly to prevent food from reenter-

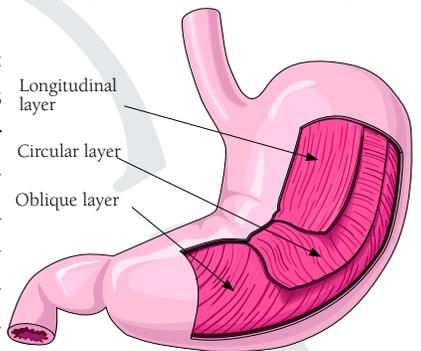
ing mouth. Food passes into the esophagus and moves toward the stomach aided by gravity and peristalsis which are alternate muscular contractions. The last three inches of the esophagus is



called the cardiac sphincter which is a muscular valve which prevents the stomach contents from backing up into the esophagus.

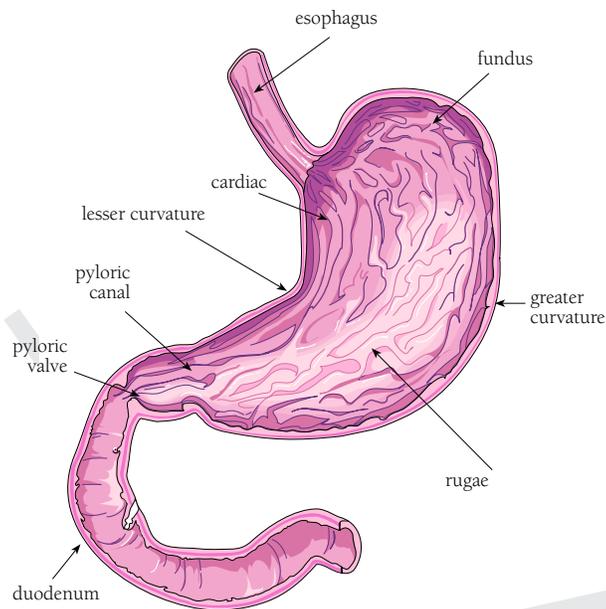
The stomach has three layers of muscles. Like other parts of the alimentary canal, the stomach has a longitudinal layer and a circular layer of smooth muscles.

In addition, the stomach also has an oblique layer of smooth muscles to assist in churning the contents of the stomach to aid digestion.



The stomach serves as a food reservoir for chemical and mechanical digestion and also functions as an absorption site. There are four parts of the stomach, the cardiac, the fundus, the body, and the pylorus.

The cardiac is the portion of the stomach that receives the esophagus. The opening is called the cardia which is the location of the gastroesophageal sphincter (cardiac sphincter) which assists in keeping food in the stomach so it does not back up into the esophagus. This sphincter is identified by



a thickening of the circular muscles in the walls of the stomach at that point.

The fundus is the temporary storage site for foods and liquids and sometimes becomes filled with gases. The body is the mid-portion of the stomach which leads to the pylorus or pyloric region that leads through the pyloric sphincter to the duodenum portion of the small intestine.

As the food enters the stomach, the walls of the stomach can expand dramatically due to the thick layers of smooth muscle, and the numerous folds of the mucosa called rugae.

Stomach produces many different enzymes/juices/hormones to assist in the breakdown of food and in particular proteins which are primarily digested in the stomach. The parietal or oxyntic cells of the stomach produce hydrochloric acid (HCl) which assists in breaking down protein as a pH of 1.5 to 3.5 is required to activate pepsin. Additionally this pH is beneficial in defending the body from bacteria that may enter the system through the mouth.

Pepsinogen is produced by the chief or zymogenic cells. Pepsinogen is the inactive form of pepsin and is activated by the hydrochloric acid

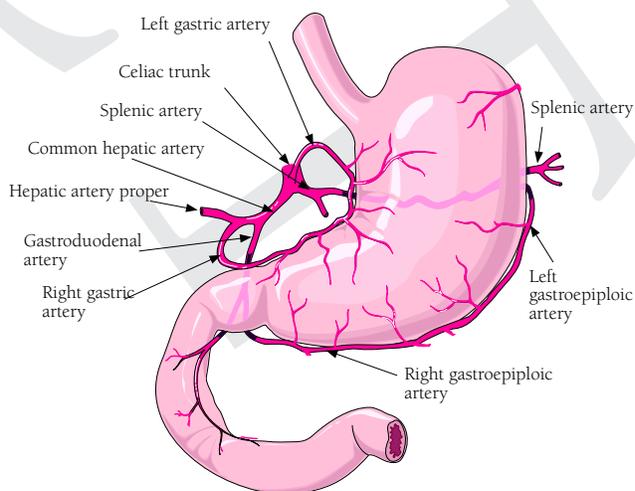
produced by the parietal cells of the stomach. The enzyme pepsin begins digestion and starts to turn proteins into proteoses and peptones.

Another important product of the parietal cells is intrinsic factor. Intrinsic factor is required for the assimilation of vitamin B¹² which is essential in producing mature erythrocytes.

The enteroendocrine cells release various hormones required for digestion. The most important hormone for digestion is gastrin from the pylorus portion of the stomach which is released into the blood stream and causes muscular contractions of the stomach and regulates secretion of the digestive juices to assist in digestion.

The stomach receives its innervation primarily from the vagus nerve that splits as it passes the thorax into the cardiac plexus, the pulmonary plexus and the esophageal plexus. The esophageal plexus innervates the esophagus and then continues to become the anterior and posterior vagal trunks. The vagal trunk follows the esophagus down into the abdominal cavity. Here the sympathetic and parasympathetic, the fibers intermingle and innervate the stomach, the liver, the gallbladder, the small intestines, kidneys, pancreas and a portion of the large intestine.

The arteries that service the stomach originate from the aorta that divides into the celiac trunk. From the celiac trunk, the arteries once

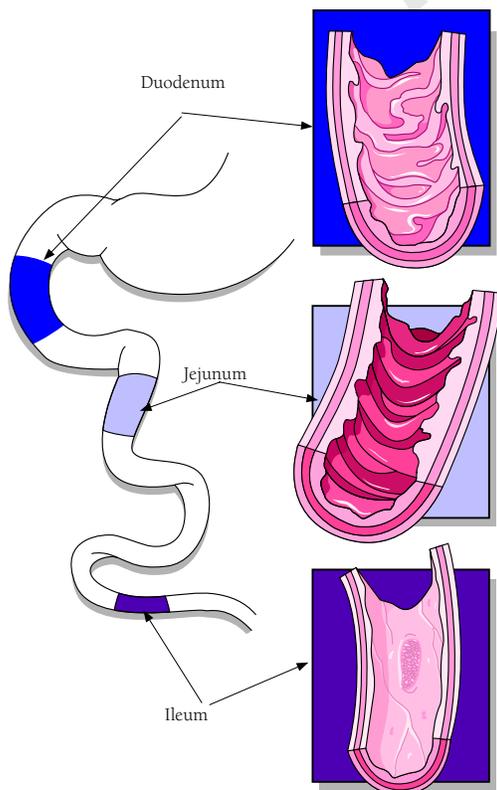
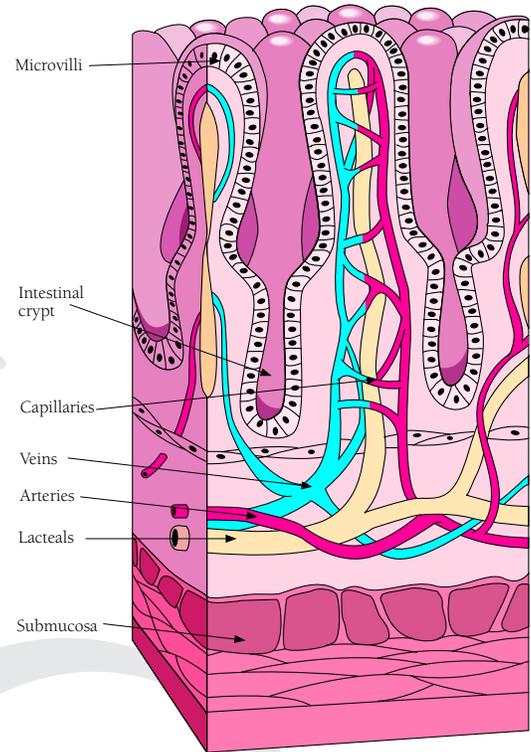


again divide into three branches; the hepatic, the splenic, and the left gastric arteries. The hepatic artery branches off into the gastroduodenal artery, the right gastric artery, and the hepatic artery proper. The right gastric artery feeds the lesser curvature of the stomach, while the gastroduodenal artery splits off to become the right gastroepiploic artery which in part feeds the greater curvature of the stomach. The left gastroepiploic artery, that also feeds the greater curvature of the stomach, is a branch off of the splenic artery. Finally, the left gastric artery works with the right gastric artery to supply blood to the lesser curvature of the stomach. The left gastric artery also feeds the inferior portion of the esophagus.

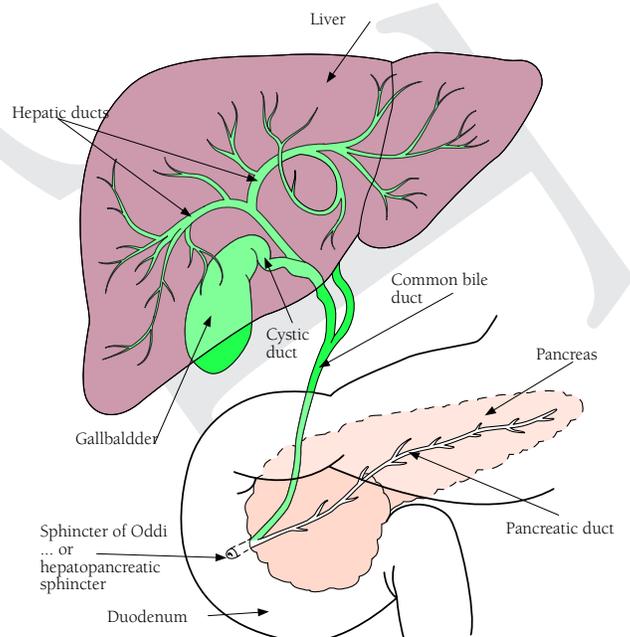
The alimentary tract continues from the stomach, through the pyloric valve of the stomach into the small intestine.

The small intestine's function is to digest proteins, carbohydrates and fats and absorb foods. The small intestine is approximately 23 feet long and has three parts, the duodenum, jejunum, ileum.

Lining the small intestine are millions of villi. Villi are fingerlike projections that dramatically increase the absorptive area of the small intestine. Also located in the mucosal layer of the small intestine are crypts of Lieberkuhn.



The duodenum receives the chyme from the stomach along with the secretions from the stomach, the pancreas, and the liver.



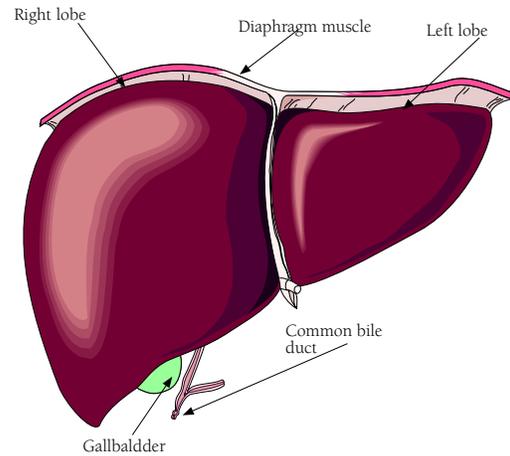
The pancreas is both an endocrine and exocrine gland and is important to the digestive process as it produces many important digestive enzymes. It is composed of epithelial cells. The exocrine secretions, or pancreatic juice, produced by the pancreas are carried to the small intestine by the pancreatic duct that merges with the common bile duct.

Inside the pancreas are the acini cells that secrete digestive enzymes and buffers of exocrine origin. The acini cells produce sodium bicarbonate which neutralizes the hydrochloric acid (HCl) produced in the stomach. The acini cells of the pancreas also produces amylase to digests starch, it produces proteinases such as trypsin (which was trypsinogen activated by enterokinase) to digest protein into amino acids, chymotrypsin and carboxypeptidase. It produces lipase that digests fats to fatty acids and glycerol. Finally the acini cells produce nucleases that function to digest nucleic acid.

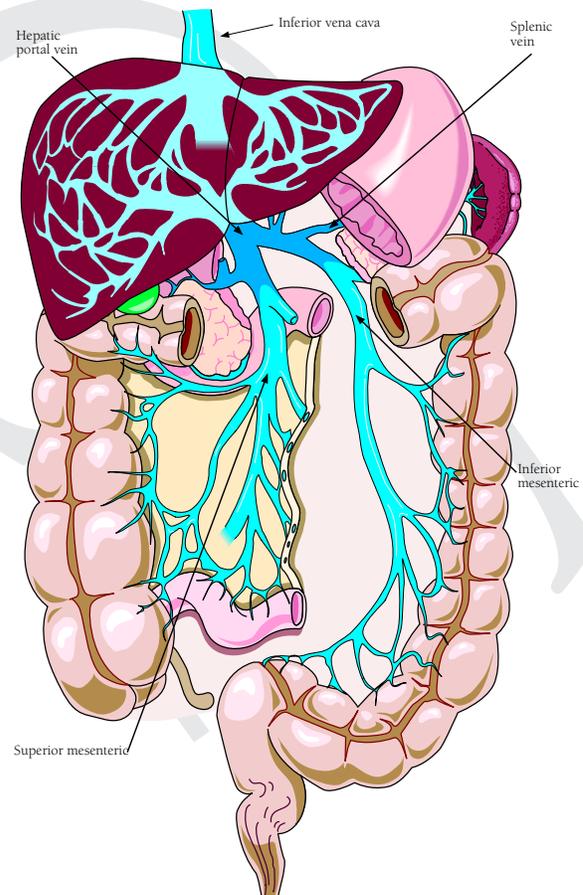
The pancreatic islets or islets of Langerhans are the endocrine portion of the pancreas that produces both insulin and glucagon, these hormones assist in carbohydrate metabolism.

Pancreatic secretions are controlled by the parasympathetic system and hormones. Secretin is released in the presence of HCl and cholecystokinin is released in the presence of proteins and fats. These hormones stimulate the action of the pancreas.

The liver, the largest gland in the body, also provides bile through the common bile duct to the small intestine. In addition to the liver producing bile which emulsifies fats, the liver functions to neutralize or detoxify substances. Fatty acids and glycerol can only be absorbed in the presence of bile salts. It assists metabolism by converting lactic acid to glucose, glucose to glycogen, and carbohydrates to proteins. The liver stores vitamins and minerals, it stores A, B, B12, D, E, & K and stores trace metals copper and iron.



In addition to producing bile, the liver functions as the “oil filter” of the body. All blood that leaves the digestive tract flows through the liver prior to being returned to general circulation. The blood flows from the inferior mesenteric and superior mesenteric veins to the hepatic portal veins into the liver where the blood is cleaned and filtered. The toxins removed from the blood in the liver are then returned into the small intestines with the bile.



Bile is produced by hepatic cells from cholesterol. It is composed of bile salts, bile acids, lipids, and the pigments bilirubin and biliverdin. These pigments are products of breakdown of red blood cells and are generally excreted with the bile.

Attached to the underside of the liver is the gall bladder which stores bile from the liver and transports bile to the duodenum through cystic duct and the common bile duct.

The small intestine produces lactase, maltase, and sucrase to help breakdown complex carbohydrates to simple sugars. Bile produced in the liver assists in the breakdown of fats into fatty acids. If the chyme traveling into the duodenum is high in fat content, then the hormone cholecystokinin is produced that increases the production of bile and pancreatic enzymes while at the same time slowing down the peristalsis in the stomach.

When the duodenum (meaning about twelve fingers in length - 10 inches) becomes filled with chyme, the walls of the duodenum are stretched and the enterogastric reflex is stimulated. This reflex initiates action in the small intestines and terminates action in the stomach.

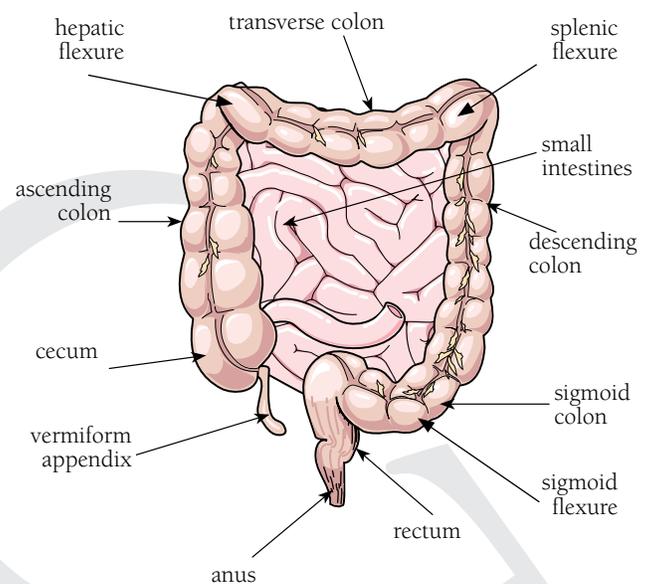
The jejunum is about eight feet in length and the ileum is about twelve feet in length. The ileum ends at the ileocecal valve

Most of the digestion and a majority of the absorption occurs in the small intestine. Acid chyme from the stomach is neutralized in the intestine by pancreatic, liver and intestinal secretions. This occurs such that the pH of the intestine is continually increasing as the chyme moves from the duodenum toward the ileocecal valve.

As the chyme continues to move through the alimentary tract, it leaves the small intestine by passing through the ileocecal valve and moves into the cecum portion of the large intestine.

Most of the digestion and absorption is complete by the time the chyme reaches the cecum of the large intestine. The major function of the large intestine is the formation and elimination of feces, the absorption of water and the absorption of important vitamins such as vitamin B and K which are absorbed by the large intestine and stored in the liver. Feces consists of undigested food residues, intestinal epithelium, mucus, bacteria, and a large amount of water.

The large intestine extends from the ileocecal valve to the anus. It is approximately five feet long with an average diameter of 2 1/2 inches. The large intestine is divided into five sections: cecum, ascending, transverse, descending and sigmoid colon.

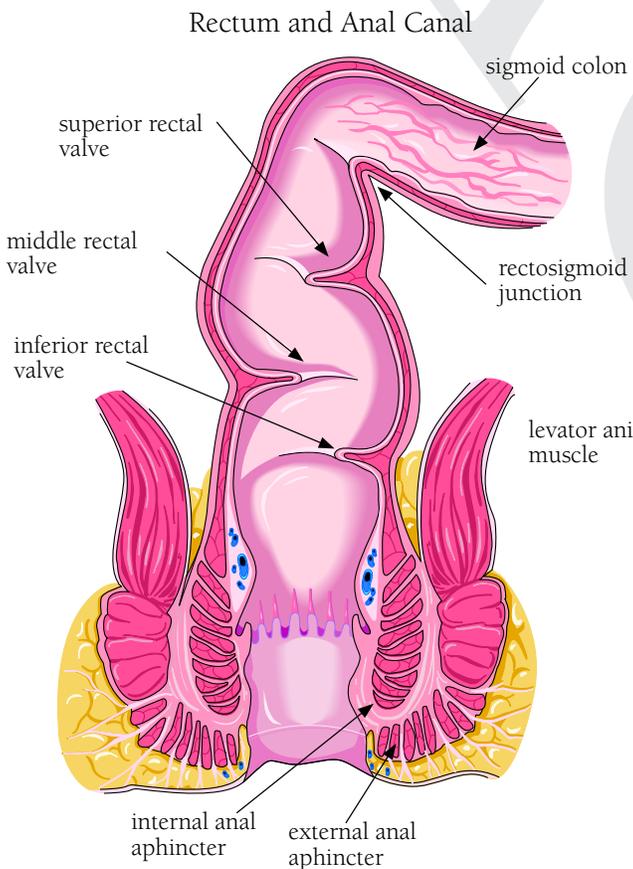


The cecum, called a blind pouch, with a diameter of approximately 3 inches, receives chyme from the ileum, through the ileocecal valve. A small, worm-like tube, the vermiform appendix is attached to the cecum.

From the cecum, arises the ascending colon which is approximately 8 inches long and is located on the right side of the abdomen and extends upwards toward the liver. The colon curves to the left at the hepatic flexure and becomes the transverse colon which is approximately 16-20 inches long.

The transverse colon extends across the abdomen to the splenic flexure. At the splenic flexure the colon turns downward forming the descending colon which is approximately 10-12 inches long. At the iliac crest the colon turns medial and superior direction resembling the letter S. This turning point is the sigmoid flexure with the region of the colon identified as the sigmoid colon which has a length of approximately 16 inches. The sigmoid colon empties into the rectum which is approximately 7 inches long.

In the rectum there are three semilunar valves called the valves of Houston which are located in the mucosal layer of the rectum. These valves; the superior, middle, and inferior rectal valves, slow fecal movement through the rectum. The rectum is generally empty unless defecation is occurring. The descending and sigmoid colon usually evacuate at the same time. The last two to three inches of the rectum is called the anal canal which is lined with squamous epithelium instead of a mucous membrane.

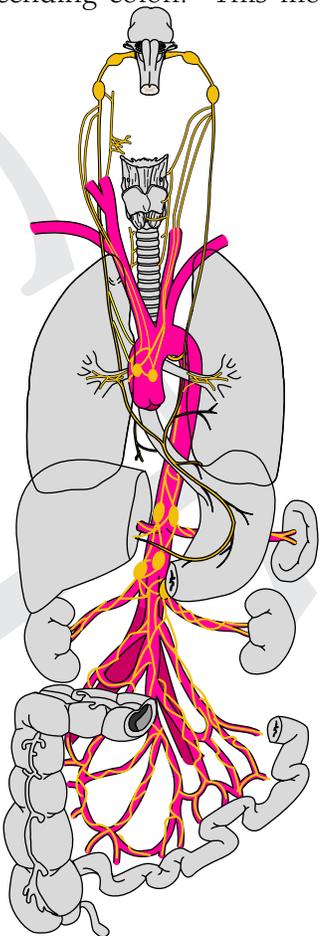


Located at the end of the anal canal are two sphincter muscles the internal muscle is a smooth muscle while the external anal sphincter is a skeletal muscle. The external muscle is under voluntary control while the internal muscle is an involuntary muscle. Working in concert with the external sphincter is the levator ani muscle which closes off the anal canal at the end of defecation.

There are various types of peristaltic movements; haustral churning, pendular movements peristalsis, mass peristalsis, and anti-peristalsis. Haustral contractions are slow segmented movements that involves the filling, distension and contraction of a haustrum; this moves chyme from one haustrum to the next through the contractions of the longitudinal muscle bands of the colon. Pendular movements are the slow pendular-like, swinging motion of the transverse colon. Peristalsis is the slow wave-like contractions of the longitudinal and circular muscles which aids in moving the chyme along the ascending colon. This motion is countered to a small degree by reverse peristalsis that assists in forming the stool and in the absorption of fluids in the ascending colon.

Mass peristalsis occurs only two to three times every day and are strong peristaltic contractions in the descending and sigmoid colon which pushes the fecal material into the rectum in preparation for defecation.

The innervations of the small and large intestines come from the vagal trunk which follows the esophagus down into the abdominal cav-

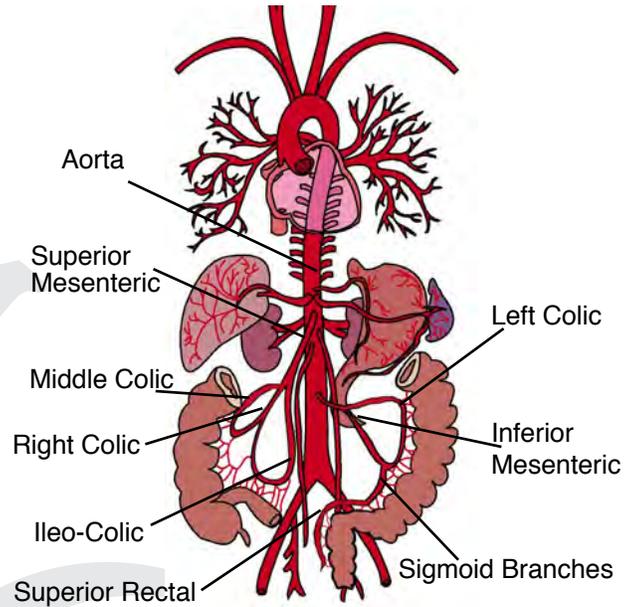


ity. Here the sympathetic and parasympathetic fibers intermingle and innervate the stomach, the liver, the gallbladder, the small intestines, kidneys, pancreas and a portion of the large intestine. The remaining portion of the large intestine (the descending colon, the sigmoid colon, the rectum and the anus) and the pelvic organs receive innervations from the sacral outflow branches.

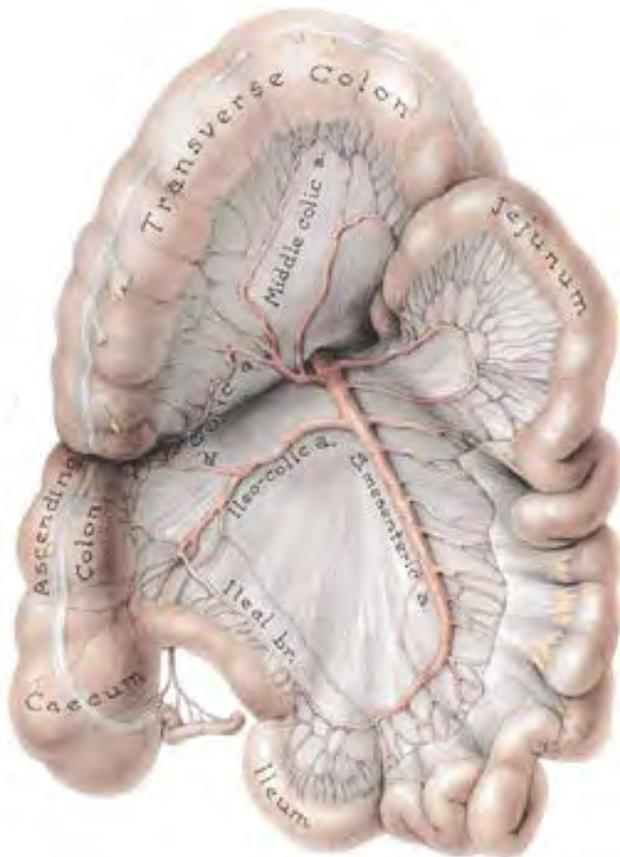
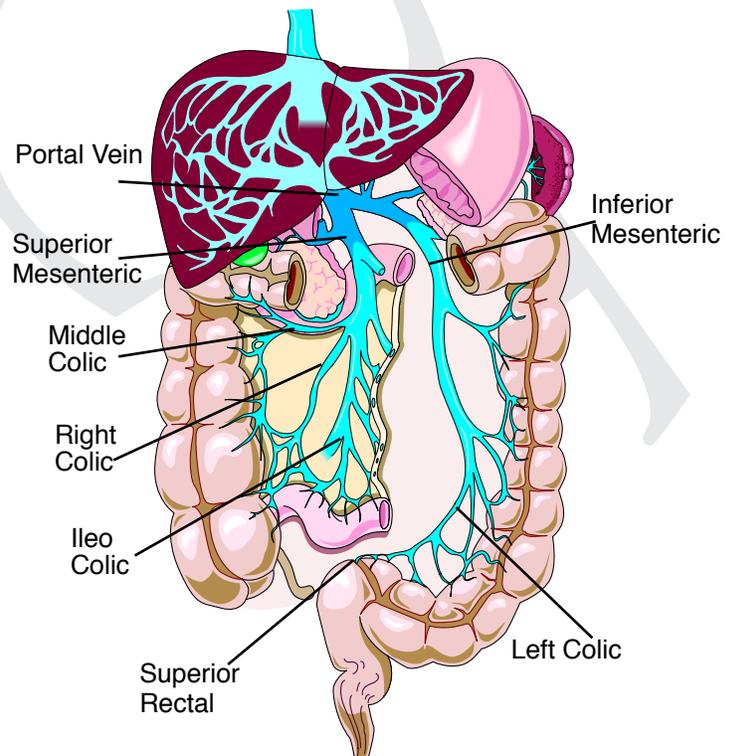
The arteries that supply the small and large intestines start with the pyloric and pancreaticoduodenal branches of the hepatic artery and the inferior pancreaticoduodenal branch of the superior mesenteric provide blood to the duodenum. The jejunum and the ileum are supplied by the superior mesenteric artery.

The arteries supplying the colon originate from the superior mesenteric artery as it branches into the intestinal arteries. The ileocolic artery serves the appendix, the cecum, the ascending colon. Part of the transverse colon is serviced by the middle colic arteries. The inferior mesenteric ar-

tery, which is the final major branch of the abdominal aorta (through the left colic branch, the sigmoidal branch and the superior rectal branch) serves the midpart of the transverse colon, the descending colon, the sigmoid colon, to the mid rectum. The inferior rectal artery serves the distal portion of the rectum and the anus.



The veins are similarly named with the smaller veins flowing into the portal vein.



Health & Hygiene

HYGIENE, SANITATION AND PUBLIC HEALTH

The word 'hygiene' comes from hygeia, the Greek Goddess of health, who was the daughter of Aesculapius, the God of Medicine. Since the advent of the Industrial Revolution (1750 – 1850) and the discovery of the germ theory of disease, hygiene and sanitation have been at the forefront of the struggle against illness and disease¹.

Hygiene is the maintenance of healthful practices. Today it is usually regarded as a reference to cleanliness. In modern terms, it has become to mean any practice leading to the absence of harmful levels of germs. It also includes outward signs of an absence of visible dirt or of bad smells. Good hygiene is an aid to health, beauty, comfort and social intercourse.

Hygiene practices, such as frequent hand washing or the use of boiled (sterilized) water in medical procedures have a profound impact on reducing the spread of disease. Hand washing is the most common example of hygienic behavior. Washing is often done with a disinfective soap which helps to remove oils and to break up dirt particles so they may be washed away.

The colon hydrotherapist must always be concerned with their own personal hygiene as well as the hygiene of their colonic facility. Their personal hygiene should include; periodic washing of their body and hair, wearing of clean clothes, frequent washing of hands and/or face. Also general avoidance of bodily fluids to include; suppression of habits such as spitting or nose-picking and holding a hand in front of the mouth when sneezing or coughing.

The hygiene of their facility would include the outside environment as well as the internal environment to include the waiting room facility and restroom as well as the colonic room and the

particular device being used.

The external environment should appear tidy and well kept. The building should be in good repair and appear 'clean' and appealing. The lawn and garden areas need to be welcoming. Its' appearance outwardly will reflect on what one will perceive the internal environment to be.

On entering a colonic establishment, one would expect the waiting /reception area to be clean and neat and tidy. The area should be inviting and peaceful. One might expect to find comfortable sitting, relaxing pictures, plants and appropriate reading materials regarding colon hydrotherapy.

The restroom must be clean at all times. It should be checked after each client leaves the facility. It need not be sanitized, but disinfected and clean. There should also be an ample supply of toilet paper, towels, and disinfective soap. The restroom should have both hot and cold running water.

The colonic room where the colonic is administered is an area which must be disinfected as well as sanitized. The colonic device being used by the therapist or an appointed assistant must only use the disinfectants which are recommended by the manufacturer in their operations manual. There can be no substitutions at any time. The colonic device must be properly cleaned and disinfected after each client. The therapist must always follow the cleaning procedures as outlined in their specific operations manual for their specific colon hydrotherapy device.

It is of utmost importance that the colon hydrotherapist use only disposable rectal speculums, rectal nozzles and rectal tubes. Under no circumstances or situations should disposables be reused!

If disposables are not used, specific disinfective/sanitation measures must be adhered to. One method is by boiling the rectal device at 212 degrees F for at least twenty (20) minutes. Another

way is to use sterilizers and Autoclaves at PSI 27 – 31 and at 132 degrees C or 270-275 F for at least 1/2 hour.

Hygiene in the office, as well as the therapist's personal hygiene, is just as important as in helping our clients with their colon.

UNIVERSAL PRECAUTIONS FOR PREVENTION OF TRANSMISSION OF HIV AND OTHER BLOODBORNE INFECTIONS²

“Universal precautions,” as defined by CDC, are a set of precautions designed to prevent transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens when providing first aid or health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other bloodborne pathogens.

Universal precautions took the place of and eliminated the need for the isolation category “Blood and Body Fluid Precautions” in the 1983 CDC Guidelines for Isolation Precautions in Hospitals. However, implementing universal precautions does not eliminate the need for other isolation precautions, such as droplet precautions for influenza, airborne isolation for pulmonary tuberculosis, or contact isolation for methicillin-resistant *Staphylococcus aureus*.

Universal precautions differ from the system of Body Substance Isolation (BSI) used in some institutions. For information about BSI, refer to the following articles:

1. Lynch P, et al. Rethinking the role of isolation precautions in the prevention of nosocomial infections. *Annals of Internal Medicine* 1987;107:243-246.

2. Lynch P, et al. Implementing and evaluating a system of generic infection precautions: Body substance isolation. *American Journal of Infection Control* 1990;18:1-12.

In 1996, CDC published new guidelines (standard precautions) for isolation precautions in hospitals. Standard precautions synthesize the major features of BSI and universal precautions to prevent transmission of a variety of organisms. Standard precautions were developed for use in hospitals and may not necessarily be indicated in other settings where universal precautions are used, such as child care settings and schools.

Universal precautions apply to blood, other body fluids containing visible blood, semen, and vaginal secretions. Universal precautions also apply to tissues and to the following fluids: cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids. Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. Universal precautions do not apply to saliva except when visibly contaminated with blood or in the dental setting where blood contamination of saliva is predictable.

Universal precautions involve the use of protective barriers such as gloves, gowns, aprons, masks, or protective eyewear, which can reduce the risk of exposure of the health care worker's skin or mucous membranes to potentially infective materials. In addition, under universal precautions, it is recommended that all health care workers take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices.

Pregnant health care workers are not known to be at greater risk of contracting HIV infection than are health care workers who are not pregnant; however, if a health care worker develops HIV infection during pregnancy, the infant is at risk of infection resulting from perinatal transmission. Because of this risk, pregnant health care workers should be especially familiar with, and strictly adhere to, precautions to minimize the risk of HIV transmission.

WRITTEN GUIDELINES: UNIVERSAL PRECAUTIONS

Universal precautions are discussed in the following documents: CDC. Recommendations for prevention of HIV transmission in health-care settings. MMWR 1987;36(suppl no. 2S).

1. CDC. Update: Universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other blood-borne pathogens in health-care settings. MMWR 1988;37:377-388.

2. CDC. Guidelines for prevention of transmission of human immunodeficiency virus and hepatitis B virus to health-care and public-safety workers. MMWR 1989;38(S-6):1-36.

3. These three documents may be obtained by calling the AIDS Hotline at 1-800-342-2437 or the National AIDS Information Clearinghouse at 1-800-458-5231.

In addition, the Occupational Safety and Health Administration (OSHA) has published a standard on "bloodborne pathogens." For information about this document, call 202-219-7157.

For information on infection control in dental practice, call 1-800-458-5231 to obtain "The InfectionControl File." For further questions on dental practice, call the Division of Oral Health, CDC, telephone 770-488-3034.

GLOVING, GOWNING, MASKING, AND OTHER PROTECTIVE BARRIERS AS PART OF UNIVERSAL PRECAUTIONS

All health care workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure during contact with any patient's blood or body fluids that require universal precautions.

Recommendations for the use of gloves are pre-

sented in detail in the Morbidity and Mortality Weekly Report dated June 24, 1988, which is available by calling the National AIDS Information Hotline at 1-800-342-2437 or the National AIDS Information Clearinghouse at 1-800-458-5231.

Gloves should be worn:

- for touching blood and body fluids requiring universal precautions, mucous membranes, or nonintact skin of all patients, and
- for handling items or surfaces soiled with blood or body fluids to which universal precautions apply.

Gloves should be changed after contact with each patient. Hands and other skin surfaces should be washed immediately or as soon as patient safety permits if contaminated with blood or body fluids requiring universal precautions. Hands should be washed immediately after gloves are removed. Gloves should reduce the incidence of blood contamination of hands during phlebotomy, but they cannot prevent penetrating injuries caused by needles or other sharp instruments. Institutions that judge routine gloving for all phlebotomies is not necessary should periodically reevaluate their policy. Gloves should always be available to health care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

1. Use gloves for performing phlebotomy when the health care worker has cuts, scratches, or other breaks in his/her skin.
2. Use gloves in situations where the health care worker judges that hand contamination with blood may occur, e.g., when performing phlebotomy on an uncooperative patient.
3. Use gloves for performing finger and/or heel sticks on infants and children.
4. Use gloves when persons are receiving training in phlebotomy.

The Center for Devices and Radiological Health, Food and Drug Administration (FDA), has responsibility for regulating the medical glove industry. For more information about selection of

gloves, call FDA at 301-443-8913.

Masks and protective eyewear or face shields should be worn by health care workers to prevent exposure of mucous membranes of the mouth, nose, and eyes during procedures that are likely to generate droplets of blood or body fluids requiring universal precautions. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or body fluids requiring universal precautions.

All health care workers should take precautions to prevent injuries caused by needles, scalpels, and other sharp instruments or devices during procedures; when cleaning used instruments; during disposal of used needles; and when handling sharp instruments after procedures. To prevent needlestick injuries, needles should not be recapped by hand, purposely bent or broken by hand, removed from disposable syringes, or otherwise manipulated by hand. After they are used, disposable syringes and needles, scalpel blades, and other sharp items should be placed in puncture-resistant containers for disposal. The puncture-resistant containers should be located as close as practical to the use area. All reusable needles should be placed in a puncture-resistant container for transport to the reprocessing area.

General infection control practices should further minimize the already minute risk for salivary transmission of HIV. These infection control practices include the use of gloves for digital examination of mucous membranes and endotracheal suctioning, handwashing after exposure to saliva, and minimizing the need for emergency mouth-to-mouth resuscitation by making mouthpieces and other ventilation devices available for use in areas where the need for resuscitation is predictable.

Although universal precautions do not apply to human breast milk, gloves may be worn by health care workers in situations where exposures to breast milk might be frequent, e.g., in breast milk

banking.

PROPER TECHNIQUE FOR PUTTING ON AND TAKING OFF GLOVES³

Using the Personal Protective Equipment (PPE) correctly is another link in the chain of keeping a person safe. If the PPE is not worn or used correctly then it may not offer the expected protection to the user. Below are guidelines for putting on (donning) and removing gloves (doffing), as well as the appropriate times and places to wear gloves.

Donning Gloves

- » Wash hand before putting gloves on.
 - » Remove all jewelry from hands.
 - » Pick up one glove with the right hand
 - » Line the thumb side of the glove up with the thumb side of the left hand
 - » Slip the open end of the glove over the left hand and thumb
 - » Stretch the palm side of the glove with the right hand, pulling the glove on to finger level.
 - » Position the fingers of the glove in line with the fingers of the left hand.
 - » Pull the remainder of the glove onto the left hand.
 - » Pick up the second glove with the gloved left hand.
 - » Line the thumb side of the glove up with the thumb side of the right hand.
 - » Slip the open end of the glove over the right hand and thumb.
 - » Stretch the palm side of the glove with the left hand, pull the glove on to finger level.
 - » Position the fingers of the glove in line with fingers of the right hand.
 - » Pull the remainder of the glove onto the right hand.
 - » Proceed with activity requiring gloves.
- Consultants, Inc. Competency: Donning Gloves

Doffing Gloves

There are two standard methods to taking off gloves. Method One for glove removal is recom-

mended, because it is harder for a person to become contaminated. However, if Method Two can be done without causing contamination, use the easiest method. Below are both methods.

Method One

- » Grasp one of the gloves and cuff and pull it partway off. The glove will turn inside out. It is important to keep the first glove partially on your hand before removing the second glove. This protects you from touching the outside of either glove with your bare hands.
- » Leaving the first glove over your fingers, grasp the second glove near the cuff and pull it part of the way off. The glove will turn inside out. It is important to keep the second glove partially on your hand to protect you from touching the outside surface of the first glove with your bare hand.
- » Pull off the two gloves at the same time, being careful to touch only the inside surfaces of the gloves with your bare hands.
- » Dispose of the gloves by placing inside out in the trash.
- » Wash hands thoroughly

Method Two

- » Grasp outside edge near wrist.
- » Peel away from hand turning glove inside-out.
- » Hold in opposite gloved hand.
- » Slide ungloved finger under the wrist of the remaining glove, be careful not to touch the outside of the glove.
- » Peel off from inside, creating a bag for both gloves
- » Discard
- » Wash hands thoroughly

Do's and Don'ts of Glove Use

- » Work from clean to dirty—this will help prevent contamination
- » Don't touch your face or adjust PPE with contaminated gloves

- » Don't touch environmental surfaces – door-knobs, keyboards, computer mouse. This means when leaving the laboratory TAKE OFF YOUR GLOVES. If you need to wear a glove in the hallway to carry a sample, make sure that the gloved hand is carrying the sample and the non gloved hand is operating door handles, elevator buttons, etc.
- » Change gloves when heavily soiled or if they are torn.
- » Discard gloves after use, never wash or reuse disposable gloves.

Hand Lotion and Glove Use

Usually hand lotions that contain petroleum products are incompatible with latex gloves. They can accelerate the deterioration process which can increase penetration of chemicals and viruses. However, if you suffer from dry skin, there is hope with the following product. Theratein Derma Moisturizing Lotion for Extremely Dry Skin Harmony Laboratories Inc., Landis, NC 28088 Active Ingredient: Dimethicone, 1.0%

References:

1. Faria MA Jr. In Search of the Fountain of Youth. Medical Worrier: Fighting Corporate Socialized Medicine. Macon, GA: Hacienda Publishing, Inc., pp. 121-125.
2. The information was extracted from the Center for Disease Control and Prevention: http://www.cdc.gov/ncidod/dhqp/bp_universal_precautions.html
3. WEB SEARCH - Disposable Glove - technique for removing - <http://ehs.uky.edu/ohs/gloveuse.html>. Contact Information: Jan Eggum, Laboratory Safety Specialist
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I- ACT COLON HYDROTHERAPY

Colon Hydrotherapy Standard Operating Procedures, Regulations and Guidelines

- October 2012

Purpose

(1) These Business and Professional Regulations are promulgated in an effort to protect the health, safety and welfare of the public by ensuring that only those who are qualified by certification to administer colon hydrotherapy may do so.

(2) Prior to the administration of colon hydrotherapy, any person shall be required to present certification to the Board of successful completion of a course of study approved by I-ACT through an I-ACT approved colon hydrotherapy school or instructor and certified at the Foundation Level.

Scope of Practice

Colon Hydrotherapy is the introduction of warm, filtered and temperature regulated water into the colon, the waste is softened and loosened, resulting in evacuation through natural peristalsis. This is repeated several times during the session.

Definitions

(1) “Board” means the Board of Directors of the International Association for Colon Hydrotherapy (I-ACT).

(2) “Education Committee” is a group of dedicated members of I-ACT who volunteer their service to recommend educational guidelines to the Board.

(3) “Establishment” means an appropriate site or premises, or portion thereof, where a colon hydrotherapy session occurs

(4) “Colon Hydrotherapy” is the introduc-

tion of warm, filtered and temperature regulated water into the colon, the waste is softened and loosened, resulting in evacuation through natural peristalsis. This is repeated several times during the session.

(5) “Student” means a person studying colon hydrotherapy at any of the four Levels of training (i.e., Foundation Level, Intermediate Level, Advanced Level, or Instructor Level).

(6) “Instructor” means a certified colon hydrotherapist who plans to carry out the training and instruction of a student for a limited period of time. Instructors may train one to two students at a time.

(7) “Certification” means the procedure by which a colon hydrotherapist applies to the Board for approval documenting the student has successfully passed the I-ACT certification examination and fulfilled all requirements for each level of certification.

(8) “I-ACT recognized colon hydrotherapy school” means a facility which agrees to comply with the training and curriculum as recommended by I-ACT. Each school must be in compliance with the laws of their state. Schools may train as many students as they have room for.

(9) Equipment Classification Enema Kit

From the code of federal regulations (CFR) 876.5210 Enema Kit. (

a) Identification. An enema kit is a device intended to instill water or other fluids into the colon through a nozzle inserted into the rectum to promote evacuation of the contents of the lower colon. The device consists of a container for fluid connected to the nozzle either directly or via tubing. This device does not include the colonic irrigation system (Sec. 876.5220).

(b) Classification. Class I (general controls). The device is exempt from the premarket notification procedures in subpart E of part 807 of this chapter subject to Sec. 876.9. The device is exempt from the current good manufacturing

practice regulations in part 820 of this chapter, with the exception of Sec. 820.180 of this chapter, with respect to general requirements concerning records, and Sec. 820.198 of this chapter, with respect to complaint files. [48 FR 53023, Nov. 23, 1963, as amended at 65 FR 2317, Jan. 14, 2000]

Colonic Irrigation System

From the code of federal regulations (CFR) Sec. 876.5220 Colonic irrigation system.

(a) *Identification.* A colonic irrigation system is a device intended to instill water into the colon through a nozzle inserted into the rectum to cleanse (evacuate) the contents of the lower colon. The system is designed to allow evacuation of the contents of the colon during the administration of the colonic irrigation. The device consists of a container for fluid connected to the nozzle via tubing and includes a system which enables the pressure, temperature, or flow of water through the nozzle to be controlled. The device may include a console-type toilet and necessary fittings to allow the device to be connected to water and sewer pipes. The device may use electrical power to heat the water. The device does not include the enema kit (Sec. 876.5210).

(b) *Classification.* (1) Class II (performance standards) when the device is intended for colon cleansing when medically indicated, such as before radiological or endoscopic examinations. (2) Class III (premarket approval) when the device is intended for other uses, including colon cleansing routinely for general well being.

(c) *Date PMA or notice of completion of a PDP is required.* A PMA or a notice of completion of a PDP is required to be filed with the Food and Drug Administration on or before December 26, 1996 for any colonic irrigation system described in paragraph (b)(2) of this section that was in commercial distribution before May 28, 1976, or that has, on or before December 26, 1996 been found to be substantially equivalent to a colonic irrigation system described in paragraph (b)(2) of this section that was in commercial distribution before May 28, 1976. Any other colonic irrigation system shall have an approved PMA in effect

before being placed in commercial distribution. [48 FR 53023, Nov. 23, 1983, as amended at 52 FR 17738, May 11, 1987; 61 FR 50707, Sept. 27, 1996]

Qualifications for Individual Certification

(1) Any person is qualified for certification as a colon hydrotherapist who:

(a) Has presented certification to the Board of successful completion of a course of study approved by I-ACT through an I-ACT recognized colon hydrotherapy school or instructor and certified at the Foundation Level; or, who has presented documentation they have been practicing in the field of colon hydrotherapy for more than one year and have performed more than 100 colonics in the past year and has passed a mandatory eight (8) hour course put on by an I-ACT instructor or school.

(b) Has taken the I-ACT written test and received a passing grade.

(c) Has completed the remaining requirements as directed by the I-ACT Board.

Examinations

(1) A written examination for each level of certification shall be offered by I-ACT at least once yearly (at the annual convention), at regional meetings, at I-ACT recognized schools or with an I-ACT Instructor. There is a fee of \$75.00 for each level of examination.

(a) The testing for Level 4 (Instructor Level) requires the completion of a 60 hour course put on by an I-ACT school or with an I-ACT Instructor. During that training, the individual will teach for a total of four instructor hours. Three {3} hours may be accomplished at an I-ACT recognized school, or with an I-ACT Instructor (it is desired that minimum of 8 individuals attend the instructor presentations). One hour must be completed at an I-ACT Convention (at a minimum, the presenting instructor should wear business casual attire). In

addition, the prospective instructor must attend a mandatory two hour instructor workshop provided at the convention. After attending the mandatory 60 hour Instructor class, the instructor candidate may practice the one hour presentation at Regional meetings.

(2) Upon an applicant's passing the test and paying the initial certification fee and fulfilling all requirements for I-ACT Level 1, I-ACT shall then certify the individual at the Foundation Level. Completion of the requirements for Level 2, 3 or 4 will cause I-ACT to certify the individual at that level.

(3) All certification examinations must be proctored and an accurate record of each examination shall be made; and that record, together with all examination papers, shall be filed by I-ACT or the school certifying the examination and be kept indefinitely.

(4) Members testing at the convention be allowed to take a test 2 times during the convention. If the member fails the exam 2 times they will be required to show additional training before they can retest. They may retest and pay \$75 for the test. If they fail this test they will be required to wait 6 months and show they have additional training. Before they can retest and pay an additional \$75 test fee. If the person does not pass this exam they will be required to retrain with A & P at a school, instructor or tutor and present a transcript.

(5) Maximum time allowed for Level 1 & 2 exam shall be 2 hours, and maximum time allowed for Level 3 exam shall be 3 hours. This time may be extended by the proctor as required for International students that English is not their first language or if the student has documented learning disabilities .

Posting of Certificates

(1) All members shall post their I-ACT Certificate in their colonic establishment for easy viewing by the public.

Inactive Status

(1) A member becomes inactive when an I-ACT member fails to renew their I-ACT membership, within 90 days of expiration of membership and pays an Inactive status fee of \$25.00 per year. Once a member goes inactive, they may reinstate their status by paying current years dues. However, any individual that allows their membership to I-ACT to be terminated automatically loses all levels of certification they had received. This individual must retest on each level before that level of certification may be reinstated.

I-ACT Recognized Colon Hydrotherapy School Criteria

(1) The Board shall adopt reasonable standards, for I-ACT recognized schools.

(a) An I-ACT school must have at least one certified I-ACT Instructor on staff, and all training shall be conducted or supervised by an I-ACT Instructor.

(b) The school shall teach colon hydrotherapy utilizing the I-ACT Syllabus for the Foundation, Intermediate, Advanced, or Instructor Level as appropriate to the class.

(c) All training must be performed - in person - by the instructor.

(d) The school must provide I-ACT testing at the completion of each course of training.

(e) The school must comply with all guidelines of the I-ACT's Standard Operating Procedures, Regulations & Guidelines.

(2) Any person, firm, or corporation desiring to operate a colon hydrotherapy school shall submit to I-ACT, accompanied by any information requested by I-ACT, an application for recognition fee as directed by the I-ACT Board. Additionally the school must submit proof that they are in compliance with all state laws.

(3) I-ACT retains the right to visit any recognized school as it deems necessary.

I-ACT Zero Tolerance Policy

Background: The International Association for Colon Hydrotherapy (I-ACT) recognizes the seriousness and extent of injury that any form of abuse may cause another and therefore supports Zero Tolerance of such abuse in any form: this includes any type of harassment, verbal, physical, emotional, financial or sexual, by an I-ACT member colon hydrotherapist.

I-ACT endeavors to provide protection of the public interest by addressing client-member, member-student and member-member abuse openly. I-ACT strives to provide an accessible and sensitive reporting process, and establishes deterrents through the administration of a disciplinary process reflecting the serious nature of the violation.

This policy has been created to advise our membership that I-ACT endorses the Principle of Zero Tolerance for abuse in any form and to ensure members understand that abuse in any form is unacceptable and will not be tolerated.

In defining abuse, it is important for the professional to be cognizant of the imbalance of power that exists in the professional colon hydrotherapy environment. Clients often seek professional services when they are vulnerable or in a state of pain. A member of this profession has the 'power' by virtue of their authority, knowledge, access to privileged information and the influence they potentially hold over the client, to exploit. It is expected, therefore, that the professional will address the client's needs in a sensitive and caring manner in accordance with the Standards of Practice and the Code of Ethics for the profession.

I-ACT is also aware that the most productive and satisfying environment is one in which instruction and growth is accomplished in a spirit of mutual trust and respect. Harassment is a form of discrimination that is offensive, impairs morale, undermines the integrity of Client/Member and Instructor/Student Member relationships and may

cause serious harm to the productivity, efficiency and stability of our organization and industry.

I-ACT members will maintain confidentiality of client information, unless given written permission by the client or ordered by the courts. I-ACT members will clearly represent their educational qualifications and inform clients of the limits of their license or certification. I-ACT members should refer clients to an appropriate professional for services if the treatment is not within their scope of practice. I-ACT members will use precautions to do no harm to physical, mental and emotional health of clients and associates.

Abuse can be defined as:

Harassment

Harassment on the basis of a person's gender, race, color, ancestry, ethnic or national origin, age, disability, arrest or conviction record, marital status, sexual preference, military or organizational membership will not be tolerated. Every individual has the right to receive colon hydrotherapy services, education and training in an environment which is free from discrimination, intimidation, and all forms of harassment.

Verbal - Non Verbal

Verbal abuse may include but is not limited to, derogatory comments, sarcastic, demeaning or seductive remarks. It is also important to note that the tone of verbal communications may characterize how words are perceived. I-ACT members must be aware that a person's age, culture, socio-economic status and other particular sensitivities may affect how a client perceives communications with an I-ACT member.

Jokes, insults and innuendoes (based on race, sex, age, disability, etc.), and degrading sexual remarks, such as referring to someone as a stud, hunk or babe; whistling; cat calls; comments on a person's body or sex life, and/or pressures for sexual favors are examples of verbal abuse that is completely unacceptable.

Non-Verbal behaviors that are unacceptable could be gestures, staring, touching, hugging, patting, blocking a person's movement, standing too close, brushing against a person's body, any unsolicited touch or display of sexually suggestive or degrading pictures, racist or other derogatory cartoons, drawings or communications.

Physical

Using unnecessary force in the course of providing treatment or training.

All therapist members will have an understanding regarding the Ethics of Touch.

All therapist members should follow the guidelines of the manufacturer for equipment use.

All therapist members will be aware of the I-ACT policy on insertion.

Emotional

Where a member of the profession uses the position of power to intimidate or show insensitivity toward the client or a student. Emotional abuse demeans the client or student in such a way as to lower their sense of personal worth.

Financial

The inappropriate use of a client's or student's funds, property or resources. May include such behaviors as:

- a. Attempting to, or actually persuading, deceiving, or threatening the client to part with their funds, property or possessions;
- b. Recommending excessive treatments/trainings with no **clinical indication requiring the same;
- c. Use of a client's or student's money for purposes other than that intended by the client;
- d. Failure to provide the client or student a written refund policy and
- e. Failure to provide a refund for services if requested by client.

Sexual

I-ACT defines sexual abuse to include:

- a. Sexual intercourse or other forms of physical

sexual relations between the member and the client or student;

- b. Touching of a sexual nature, of the client or the student by a member;

- c. Behavior or remarks of a sexual nature by the member towards the client; Exception: "sexual nature" does not include touching, behavior or remarks of a clinical nature appropriate to the service provided.

- d. Touch should be therapeutic in nature providing a necessary action related to the treatment for a desired result.

Policy:

I-ACT will investigate and act upon any complaints and information received dealing with allegations of abuse of a client in an effective, timely and sensitive manner.

In relation to those members found in violation of the Zero Tolerance Policy, I-ACT will uphold the sanctions mandated by the I-ACT Grievance Committee as approved by the Board. I-ACT is committed to imposing appropriate penalties to reflect the severity of the conduct of concern.

Disciplinary Guidelines

Grounds for Disciplinary Action

- (1) Attempting to procure a certificate to administer colon hydrotherapy by bribery or fraudulent misrepresentation.

- (2) Practice or offering to practice beyond the scope permitted by law or accepting and performing professional responsibilities which the certified colon hydrotherapist knows or has reason to know that he/she is not competent nor authorized to perform.

- (3) Refusing to permit I-ACT to visit the business premises of the certified colon hydrotherapist on reasonable notice.

- (4) Failing to keep the equipment and premises of the colon hydrotherapy establishment in a clean

and sanitary condition on the inside and outside of the building.

(5) Conviction of felony after membership and certification.

(6) Behavior detrimental to the profession or goals of the association.

(7) Inappropriate advertising inconsistent with I-ACT guidelines.

(8) Three verifiable grievances that have gone through the grievance process and have been determined by the Board to have merit.

Disciplinary Action

When the Board finds any person is acting in violation of any rules, it may enter an order imposing one or more of the following penalties:

(a) Refusal to certify any person, but that person can reapply within 90 days with a new application fee of \$75.00.

(b) Issuance of a reprimand or censure by promulgated, unanimous decision of the Board.

(c) Revocation of a certificate and suspension of the right to hold themselves out as an I-ACT certified colon hydrotherapist.

It is understood that any investigation, decertification, or censuring of a member, may cause I-ACT to expend funds for that investigation and may result in an expense or a cost. The person or member involved will be expected to pay this cost within 30 days. If the fee is not paid it will cause expulsion for the applicant.

Grievance Policy

1) Grievances brought forth by the public will be considered for review by the grievance committee for issues involving the following criteria:

Those documents which define standards of

behavior for I-ACT members, such as the Standard Operating Procedures, Code of Conduct, Zero Tolerance Policy, and By-Laws of I-ACT. (for example: complaints concerning scope of practice, ethics, advertising, facilities, cleanliness, and reuse of disposables. This is not an all inclusive list.)

A grievance must be in written form and signed.

2) Grievances brought forth by members of I-ACT against an Officer of the Board or Board Member, or fellow member:

Grievances considered will be those documents which define standards of behavior for I-ACT members, such as the Standard Operating Procedures, Code of Conduct, Zero Tolerance Policy, and By-Laws of I-ACT.

A grievance must be in written form and signed.

3) Grievances regarding I-ACT recognized schools will only be accepted if they pertain to, education, testing, non-compliance with the syllabi, and the Standard Operating Procedures, Code of Conduct, Zero Tolerance Policy, and By-Laws of I-ACT.

A grievance must be in written form and signed.

4) Grievances regarding manufacturers or products are not within I-ACT authority or responsibility.

5). Prior to filing a grievance, both parties seek amicable resolution. The initial approach to settling any issue is open communication. If the concern(s) is /are not resolved in a timely fashion, a formal grievance should be filed according to I-ACT procedures. The grievance should be in writing and contain information about the grievance, submission date, name, address, telephone

or cell phone number of grievant, location, date, contracts (if applicable) and description of the problem.

Disclaimer: I-ACT assumes no responsibility, legal or otherwise, for the outcome and/or resolution of any grievance.

Grievance Committee Guidelines

These are the following steps that are followed by the I-ACT Grievance Committee.

1. The office receives a grievance, logs it in and assigns a number. The office will then notify both the individual filing the grievance and the individual that the grievance was filed on that a grievance has been filed and they will be hearing from the Grievance Committee. The office then sends the grievance to the Grievance Committee for action.

2. A Committee member is assigned and notifies both parties who will be handling the grievance and will provide both individuals a projected timeline.

3. When tasked for information, the School, Instructor or Therapist filed against has 10 days to acknowledge receipt and make contact with the grievance committee member handling the grievance.

4. The School, Instructor or Therapist has up to 30 more days to send paperwork to support their side of the grievance.

5. If additional paperwork is requested by the Committee member, the School, Instructor or Therapist has an additional 10 days to supply this new paperwork.

6. Failure to respond to item 3 or 4 above will cause the School, Instructor or Therapist to be removed from the I-ACT referral list until the

grievance has been resolved.

7. The Grievance Committee members makes a determination that:

a. there are no grounds or there is no basis for the grievance - in this case, both parties are notified and no action taken.

b. the grievance is valid. Both parties are notified and the grievance Committee member attempts to find a resolution between both individuals.

c. there is not enough information provided to definitely determine there were grounds for a grievance.

7. All grievances are reported to the Board (within 30-40 days). The Board will have the final authority to assign responsibility and take final action.

8. Both parties will be notified of resolution of the Board of Directors.

Whistleblower Policy

I-ACT has established a whistle Blower policy to protect its members and employees that notify the Board or members of a policy or activity that may be in violation of the law. In part, It states:

I-ACT will not retaliate against a member or an employee who, in good faith, has made a protest or raised a complaint against some practice of I-ACT, or of another individual or entity with whom I-ACT had a business/membership relationship, on the basis of a reasonable belief that the practice is in violation of law or a clear mandate of public policy.

I-ACT will not retaliate against an employee who discloses or threatens to disclose to a supervisor or a public body any activity, policy, or practice

of I-ACT that the employee reasonably believes is in violation of a law, or a rule, or regulation mandated pursuant to law or is in violation of a clear mandate or public policy concerning health, safety, welfare, or protection of the environment.

Standard Operating Protocols

1. **INDICATION FOR COLON HYDROTHERAPY:** Must be in absolute compliance with the Code of Federal Regulations Title 21 for the Class of equipment in use. Use the indications approved by the FDA for your equipment (ie, constipation, etc.)
2. **EFFECTS:** Colon irrigation.
3. **ROUTE:** Administered rectally.
4. **FREQUENCY:** Based on the client's response and need as indicated by their physician or health-care practitioner.
5. **DURATION:** Time required for administration is normally based upon the needs of the client however, in all cases the guidelines of the manufacturer should be followed.
6. **RELEVANT HAZARDS:** To ensure the highest level of safety for the consumer, always use FDA registered equipment.

There are reports of cross contamination due to improperly cleaned / disinfected equipment or table on equipment that was not registered with the FDA.

Always follow your manufacturer guidelines for cleansing your equipment to ensure there is no spread of disease, etc.

Improper use of the equipment by not following the guidelines of the manufacturer may cause injury (ie. alleged perforation of the colon).

Under no circumstances should single use devices be reused.

Under no circumstances should FDA registered equipment be modified or altered without the manufacturer's permission.

7. **CONTRAINDICATIONS:** Follow the guidelines of your manufacturer.
8. **POSSIBLE SIDE EFFECTS:** Weakness, nausea, vomiting, hunger, flatulence, fatigue, dizziness, abnormal energy, etc.
9. **PRECAUTIONS:** None. Follow the manufacturers guidelines for your equipment.

Referring Healthcare Giver

1. All records should be made available to referring or consulting health care givers associated with the client and their therapies provided that a properly written release form is executed by the client beforehand.
2. Therapies for referral clients SHALL conform to the prescription or instructions of the referring health care giver. Client responses to indicated therapies and findings associated with all aspects of colon hydrotherapy care SHALL be reported to the referring health care giver on request.

Under no circumstances will the colon hydrotherapist prescribe or suggest other therapies, additional sessions, procedures, nutritional supplements, etc. to the client that were not originally prescribed or ordered by the referring physician or health care professional. The colon hydrotherapist may communicate to the referring health care professional an additional number of sessions to facilitate the prescription instructions

manufacturer of your equipment.

The Session

1. Follow the instructions for the session as recommended by the prescription and consistent with the guidelines of the manufacturer of your equipment.
2. All techniques, methods, and procedures that are to be used during the colon hydrotherapy session must be completely and thoroughly explained to the client in advance. In no case should any additional technique be used without the permission of the client.
3. The client must be attended, or the therapist will be immediately available to the client, during the session at all times.
4. The Therapist must be professionally groomed and attired. The client SHALL be modestly draped with an acceptable gown or covering during all procedures. Techniques used in colon hydrotherapy procedures SHALL be adopted with the attempt to maximize the client's overall personal privacy and modesty, to maintain the client's dignity, state of comfort and ease.
5. The Therapist must ensure there is no action, language, or behavior that may be interpreted as a sexual advance.
6. The Therapist must ensure they stay in their scope of practice or areas that they are licensed by law to practice.
7. Even though gloves are used, hands and nails must be thoroughly washed with an antibacterial, antifungal soap before and after each client, and as necessary during the session.
8. When using Class 1 FDA registered equipment, the client must insert and remove the speculum/rectal nozzle; for Class 2 FDA registered equipment, follow the guidelines/instructions of the

9. To ensure the safety of the client, follow the manufacturer recommendations for procedures to be used during the session. In no case should the recommendation of the manufacturer be exceeded or ignored.
10. At the end of the session, clean, sanitize, and disinfect the equipment according to guidelines provided by the manufacturer of your equipment.

Physical Premises

1. The design and physical layout of the premises, installation and maintenance of equipment, plumbing, electrical wiring, egress and ingress routes, parking and public access should conform to all local, county, and state zoning regulations. All facilities should have the proper occupancy permits and approvals by the local Board of Health, where required.
2. A separate client waiting area should be maintained.
3. Restroom facilities should be provided for and located at a convenient distance from the session room table. The restroom should have a toilet and a sink which should be used for hand washing after toileting only. A pump-type soap dispenser is the desired method of dispensing soap and should be used for maximum sanitation.

Advertising

1. The onus of responsibility should be on the colon hydrotherapist to maintain an absolutely factual and true representation of the colon hydrotherapy procedure and profession in all advertising medium, whether printed page or electronic media.

2. Advertising copy which states or implies that colon hydrotherapy can treat any disease, promise cure for any disease, or that makes unsubstantiated medical claims **SHALL NOT** be used.

“Advertising medium” means: any newspaper, airwave or computer transmission, telephone directory listing other than an in-column listing consisting only of a name, address, and telephone number, business card, handbill, flyer, sign other than a building directory listing all building tenants and their room or suite numbers, or other form of written advertising.”

I-ACT Policy Statements

I-ACT recommends the use of currently registered FDA equipment and only disposable speculums, rectal tubes, or rectal nozzles. However, should the Therapist use reusable speculums, these speculums should, at a minimum, be autoclaved for sanitation and cleanliness (30 minutes). Additionally, the autoclave unit must be tested and inspected by competent authority at least four times per year- maintain documentation. (Under NO conditions should a disposable speculum or rectal tube be reused).

I-ACT recognizes the FDA classifies equipment used to instill water into the colon through a nozzle inserted into the rectum to evacuate the contents of the colon into three distinct classes; Class I (Enema Kits), Class II and Class III are (Colon Irrigation Systems). Follow the guidelines of your manufacturer, as approved by the FDA for the type of equipment (devices) you are using. Make no claims as to the use of your device other than those approved by the FDA.

The main differences between Class I and Class II devices:

- Class 1 devices do not have any safety features and manufacturers of Class I devices may not have any third party oversight as they do not have to comply with the good

manufacturing practices that are required of Class II manufacturers.

- More specifically, the code of federal regulations CFR 876.5210 & 876.5220 describe the differences between the Class I and the Class II devices. From that regulation, a Class I device does not include “colonic irrigation devices”. A “colon irrigation device” is a Class II device which in part is described as: “The system is designed to allow evacuation of the contents of the colon during the administration of the colonic irrigation.
- The FDA requires Class II devices to be sold on or at the order of a physician or health care practitioner. This may be different in each state.

Additionally there are two areas of concern with the use of a Class I device:

- The first area of concern is the safety of the consumers, your clients. Since the Class I device does not have to comply with good manufacturing practices there are no safeguards during the manufacturing of your equipment. The Class I manufacturer does not have to maintain records, nor are they inspected as thoroughly or as rigorously as a Class II manufacturer which also reduces the safeguard for the consumer. By definition, the Class I device is an enema kit and cannot have any safety features that might protect the consumer. Class I devices consist “of a container for fluid connected to the nozzle” and does not allow for the container to be hard plumbed to the city water system. There are no back flow prevention systems to preclude the back flow of the effluent into the tubing. Additionally, without the requirement to follow the good manufacturing practices there are no guarantees that the equipment can be cleaned, disinfected and sanitized in a manner that can guarantee there is no transmission of disease to the client. Remember, our Code of Ethics states, “the health, welfare, and

comfort of our clients is our primary concern”.

- The second area of concern is the potential for inappropriate advertising. If you are using a Class I device, you may not market that as a colonic irrigation device as it clearly is an enema kit.

Although I-ACT is not aware of any laws that preclude you from assisting an individual with an enema, I-ACT does want you to consider upgrading your equipment to the equipment that provides the greatest safeguards to the public. In this profession, that would be equipment marketed as Class II devices.

Remember that I-ACT strongly recommends that all I-ACT members use FDA registered Class II devices or devices equivalent to Class II devices regulated by the appropriate agency in your country. Only individuals using FDA registered equipment will be placed on the I-ACT Web Site. Purchase equipment at your own risk. Ensure you are in compliance with your local, state, federal and country guidelines. Ensure that equipment you purchase is cleared for use in your country.

I-ACT recognizes there are two distinct types of colon irrigation systems; open and closed systems. However, it is I-ACT policy that the colon hydrotherapist / technician is always in attendance / or is immediately available to the client throughout the session. The degree of assistance is to be in compliance with the instructions of the manufacturer of the equipment as registered with the FDA, and/or as directed by a physician.

The policy on insertion is to follow the instruction of the referring physician; the guidelines of the manufacturer as approved by the FDA; or the directives from the authority of your city, county, state, or country ordinances.

I-ACT recommends that you do not put the initials (CT) for colon hydrotherapist after your name, write it out in full. According to most state laws, putting initials after your name is not allowed unless you

are licensed or have a degree from an accredited professional school.

Advertising copy which states or implies that colon hydrotherapy can treat any disease, promise cure for any disease, or that makes unsubstantiated medical claims SHALL NOT be used.

RECOMMENDED CHECK LIST (TO BE KEPT UP TO DATE AT ALL TIMES)

1. Keep a list of all major contraindications to colon hydrotherapy from the manufacturer of your equipment readily available.
2. Keep a completed, detailed and **signed** Intake Questionnaire and a current and accurate history of all clients, being careful not to make any recommendations in print or verbal.
3. Keep the original of the doctor's prescription in your clients file.
4. Keep a checklist of equipment operation procedure which should include a record of settings used on each individual client.
5. DO NOT make any medical claims or have any literature making such claims.
6. Keep an emergency procedure checklist available in the event of any unforeseen circumstances.
7. Keep the manufacturer's operation manual in close proximity to your equipment.
8. Keep a maintenance record on your equipment and include any related repair orders.
9. Keep available the name, phone number, and address of any authorized repair company, usually the equipment manufacturer.
10. Use filtered water during session and keep a record of filter element life.

11. Use currently cleared FDA modern equipment. Have your currently cleared FDA equipment properly installed by a licensed plumber, making sure that the waste hose is correctly connected to the exiting sewer system, and ensure that it adheres to all local plumbing codes.

12. Keep your equipment clean, sanitized and in good operating condition, and never bypass or alter any safety features or any other features your manufacturer has installed without manufacturer permission.

13. Single use disposables are strongly recommended, NEVER reuse any part of the disposable kit, even if it were to be used on the same client on a return visit. IF Stainless Steel speculum are used, the speculum should be autoclaved for safety and sanitation. Additionally, the autoclave unit must be tested and inspected by competent authority at least four times pe year (maintain documentation). This procedure must be in compliance with laws of your state for sterilization of stainless steel hospital equipment.

14. Always use sanitizing solution in concentrations recommended by the manufacturer.

15. Be aware that perceptions of cleanliness is of the utmost importance to members of any health department. This includes not only the appearance of your facility but your personal appearance as well.

16. Keep accurate bookkeeping and tax records.

Practice of Colon Hydrotherapy by Sylvester Yong, MD

SETTING UP A PRACTICE

Over the years, centers offering colon hydrotherapy mushroomed in many parts of the world. Some are operated in a domestic setting while others are more of a professional setting.

There are centers set up by individuals who have gained the benefit of the procedure and are keen to help others enjoy the benefit by offering the procedure to others. In other instances, centers are located within the practice of health professionals and medical practices.

THE PRACTICE OF COLON HYDROTHERAPY

ADHERENCE TO GUIDELINES OF PRACTICE

There is a continuing debate about the usefulness of the procedure by the medical community. Even though its rationale seems convincing and readily acceptable to many, there is still doubt about its validity due to the lack of available scientific evidence and clinical studies to support its use. Thus there remains the constant and close scrutiny of those in practice.

Those in practice will have also heard of the occasional reports of injury, infection and side effects associated with the procedure. The awareness of such possibilities requires the therapist to be vigilant and cautious at all time. This will lessen the chance of such incidents impacting on the practice as well as the profession of colon hydrotherapy.

Bearing in mind the above, it is clearly useful for those intending to establish a practice to consider the following actions.

- Embark on a formal program of training to acquire the necessary knowledge and skills .
- Be competent in carrying out the procedure and vigilant in supervision of the session
- Adhere to regulatory guidelines and remain updated on such requirements
- Obtaining insurance for the practice or follow the guidelines of your attorney.

Some of the areas that a therapist in practice should be paying attention to include:

- **PRESCRIPTION REQUIREMENT**
I-ACT recommends that every procedure be authorized by a prescription signed by a licensed healthcare practitioner. This is also required for the purchase of an instrument of colon hydrotherapy.
- **INSERTION OF SPECULUM**
Only health practitioners with qualifications that allow them to carry out an insertion can perform the insertion on clients. All other therapists without such pre-qualification must follow the directions of the referring physician, the guidelines of the manufacturer as registered with the FDA, or follow the guidelines of the state, municipality, etc., without guidelines, the client must insert the speculum/rectal tube.
- **LICENSE TO PRACTICE**
I-ACT is working to gain legislature approval for this procedure. It is working with the authorities in various states of USA and spending money on lobbyists and advocates to seek their support for gaining legislative approval. This is the direction to go. With formal approval and proper licensing guidelines, the practice of colon hydrotherapy will gain further credibility.
- **TRAINING AND CERTIFICATION**
There is a growing interest in the practice of colon hydrotherapy and centers offering the procedure can be found worldwide in almost every major city. While some are operated by trained therapists, many are not. This is an undesirable situation. I-ACT is working hard to encourage all therapists with interest in offering the procedure of colon hydrotherapy to

become trained and certified. If you know of anyone in this practice who is not certified, do invite them to join I-ACT.

- **FOLLOW FDA GUIDELINES**

Therapists must be aware of the guidelines laid down by the US Food and Drug Administration (FDA). FDA – US Food and Drug Administration – regulates the production of equipment used as health devices in the USA. All manufacturers of instruments of colon hydrotherapy in the USA must register their equipment with FDA. The instruments must meet guidelines of safety standards and quality control. The FDA does not regulate the use of the instruments, however, their function is to register the devices and provide the approval to market the devices.

It is thus important for all therapists to be aware of regulatory guidelines (especially in their country of practice) in order to avoid the consequence of undesirable legal actions.

Colonic instruments operated by colon hydrotherapists are considered to be a Class II medical device (under FDA regulation). This requires that all purchases of equipment and its accessories must be obtained with a prescription.

- **SAFETY CONCERNS**

In spite of the fact that the procedure colon hydrotherapy is minimally invasive, there remains a risk of infection and injury. Such incidents are isolated and rare. However when it occurs, it is highlighted in the medical literature and in the press. Every procedure carries with it the following risks.

1. **RISK OF INJURY**
2. **RISK OF INFECTION**
3. **RISK OF DEPENDENCE**
4. **RISK OF IMBALANCE**
5. **RISK OF INTERACTION**
6. **RISK OF ABUSE**

It is therefore important for therapists in practice to always be alert to the possibility of these risks to avoid their occurrence.

THE PRACTICE OF COLON HYDROTHERAPY

Theory & General Principles

The practice of colon hydrotherapy stems from the principle that regular evacuation of the bowel is necessary to avoid ill- health.

Modern day living creates circumstances such as poor diet, stressful lifestyle and unhealthy personal habits resulting in irregular and/or inefficient bowel movement.

Poor elimination will lead to the accumulation of waste matter within the bowel with subsequent health problems. This can effect digestion, absorption, intestinal flora and intestinal mucosal integrity etc and compromise intestinal function.

It is common to read about functional disturbances of the bowels resulting in different symptoms and health problems. These include indigestion, constipation, irritable bowel syndrome and a host of functional bowel disorders. .

The purpose of Colon hydrotherapy is to assist with the smooth evacuation of bowel contents. Water infused into the colon hydrates the bowels, softens and loosens waste and stimulates peristaltic contractions.

There remains a lot of misconception about the procedure and practice of colon hydrotherapy. It is worthwhile to highlight some of the common facts and myths about the procedure.

Facts

1. The procedure introduces water gently into the colon to support the evacuation of waste from the bowel.
2. The procedure is considered invasive with low risk.
3. Even though there is no evidence to support the usefulness of the procedure, its usefulness cannot be disputed and there are occasional reports of colonic irrigation offering benefits in various health situations especially with constipation.

Myths

1. The procedure is high risk
2. The procedure is dangerous and may cause serious injury.
3. Water is infused at high pressure and is sucked out afterwards
4. Insertion of speculum/rectal tube goes far into the colon
5. There is danger of introducing infection

In view of these misconceptions, a therapist in practice must be confident of the facts and be ready to respond credibly to any questions or objections.

The potential health benefits offered by colon hydrotherapy are many. It is useful in the prevention and maintenance of bowel function. When carried out efficiently for the right indications together with the proper advice on diet and nutrition, it can offer excellent results and relief.

For the procedure to be accepted by the medical community, there is a need for documentation supporting the safety and efficacy of the procedure. In conventional medicine, this is the evidence based approach. Before any procedure can be accepted in the medical profession, there is a need for proof of efficacy and safety. Since colon hydrotherapists lack the resources to carry out a major study, there remain a general bias about the value and validity of the procedure. Without such study, the medical community will not fully accept colon hydrotherapy.

The aim of colon hydrotherapy is to remove waste, debris and mucus which are not properly eliminated from the colon.

Based on recommendations, COLON hydrotherapy offers potential benefits :

- a) To prepare the bowel for diagnostic studies such as a colonoscopy
- b) To improve bowels related problems.
- c) To remove radioactive material after a barium enema
- e) For use when medically indicated.

RATIONALE FOR THE PRACTICE OF COLON HYDROTHERAPY

This is based on the belief that the procedure is useful in supporting the function of elimination

The concept of AUTO-INTOXICATION is also appealing to many although this is considered totally unfounded and unscientific by conventional medicine.

Current medical teaching is that the bowel functions normal and naturally and does not require any form of cleansing. Colon hydrotherapist will beg to differ based on the results observed during the procedure. The procedure provides the opportunity for the therapist to observe the quantity and quality of the discharging waste. It provides an opportunity to assess the discharge (ie. in the form of – solid, gaseous, state of hydration, state of digestion [food particles] and accompanyin)).

1. Maintain function

Poor elimination results in stagnation of physical waste which can lead to faecal impaction especially in the old, weak, immobile and frail. Colon function is adversely affected. Colon hydrotherapy can stimulate muscular contraction and improve bowel function, and elimination.

2. Stimulate Reflex points

This theory proposes that reflex points are scattered along the length of the colon. These reflex points represent different parts and functions of the body. Waste and mucus can impinge on these reflex points and produce symptoms and health problems.

This principle is well documented in the books of Traditional Chinese Medicine. One of the principles relate to treatment of health problems using water for cleansing and for infusing herbs and other therapeutic substances to improve the function of the colon and health.

3. Hydrates the body

The colon functions to absorb water. Almost 2

litres of chyme (digested food) arrives at the caecum. This volume is reduced to approximately 100 to 150 mls of stool before it is eliminated. Colon hydrotherapy introduces pure filtered water into the colon. A dehydrated person will actively absorb water from the colon

4. Assist in maintaining the balance between Beneficial and Harmful bacterial. The colon is a rich environment that encourages the growth of bacteria. A healthy colon contains up to a few billion bacteria.

There are useful as well as harmful bacteria. In healthy individuals, the ratio of useful to harmful bacteria is 3 : 1. When the colon is unhealthy, harmful bacteria flourishes killing off the useful bacteria, leading to health problems. Situations that may adversely effect the balance of bacteria :

- use of antibiotics
- use of steroids
- stasis
- inflammation
- poor immune function

THE PRACTICE OF COLON HYDROTHERAPY

Colon hydrotherapy is more than just a flush. Irrigating the bowels can also improve bowel function as it serves to hydrate and soften bowel contents and activate bowel contractions that helps evacuate its contents.

The results of irrigation are obvious. There is the immediate feeling of relief from symptoms of discomfort (less bloating, distension) as well as the ongoing improvement experienced by those suffering from bowel related problems such as constipation, indigestion, irritable bowel syndrome etc.

It is timely to consider actions to explore the therapeutic potentials of an age old practice that remain an enigma to modern medical practice.

Even though there remain a growing interest in the procedure, very little data or papers related to the procedure has been published. There are several

reasons contributing to this poor outcome.

1. Majority of practitioners of colon hydrotherapy are not medically trained.
2. Medical practitioners are not exploring the potential of this procedure as they are unaware of its therapeutic potential.
3. Lack of scientific evidence result in the reluctance of medical professionals to recognize the potential of the procedure.
4. There exists simply remedy for constipation (ie laxatives) that appear to resolve the clinical problem but does not address the underlying result of bowel impaction and stagnation.
5. There is a lack of awareness of the positive outcome offered by the procedure – hydration, supporting peristalsis and a more complete evacuation of bowel contents resulting from the procedure.
6. There remain a reluctance to accept the potential of the procedure .

As a procedure colon hydrotherapy can support the improvement of health in the following way. The colon functions to absorb water continuously. The whole digestive tract has a surface of 300 sq metre, the biggest area that allow exchange of molecules and chemicals.

Conventional means of drug administration is usually through the oral or parenteral (subcutaneous, intra-muscular & intra-venous injections) route.

Retention enema are commonly used in the treatment of febrile conditions, infections, inflammatory bowel diseases and many other health conditions. It is an approach that is readily carried out by Traditional Chinese Medical practitioners as part and parcel of their practice.

From a physician's perspective, colon hydrotherapy remains one of the most fundamental steps in the management of health problems. In the field of medicine, colon hydrotherapy has many different applications, such as:

- Neurology
- Geriatric medicine
- Gastroenterology
- Family practice

- Etc

Yet it is obvious that the field of Gastroenterology has the most practical applications; ie., the prevention, treatment as well as management of acute chronic digestive disorders.

COLON HYDROTHERAPY

- Managing Constipation

Constipation is one of the most common problems encountered by gastro-enterologists. The problem of chronic constipation remains a challenge to physicians confronted with such a problem. The continuing agony endured by a chronically constipated patient can at best be relieved by the continuous consumption of laxative agents as well as the use of enemas. The occasional hospitalization for refractory cases may require more elaborate investigation and perhaps manual evacuation.

The treatment of chronic constipation remain to be unsatisfactory. Current medical management of chronic constipation offers few options to address the sufferings and on-going sorrows experienced by patients. Patients often suffer the indignity of having to constantly seek out solutions from doctors and healthcare practitioners who offers simple solutions which at best can offer only slight or temporary relief. They often recommend laxatives or suppositories and/or the use of simple enemas with poor results.

Laxatives have the potential to offer a level of immediate relief. However the problem recurs for a variety of reasons.

1. Poor hydration
2. Poor diet
3. Sluggish bowel
4. Poor eating habits
5. Food intolerance resulting in gas and bloating problem
6. Other bowel problems with underlying constipation
7. Metabolic problem leading to constipation

8. Drugs resulting in constipation
9. Laxatives abuse
10. Other causes

Colon hydrotherapy offers an additional management option. Being a refinement of the old fashioned way of carrying out an enema, colon hydrotherapy allows the procedure to be carried out safely and effectively using modern instrument specifically design for the purpose.

A series of sessions of colon hydrotherapy will bring about the evacuation of physical waste with resulting relief in symptoms such as abdominal discomfort bloating, gaseous distension, etc.

Colon Hydrotherapy - Relief of symptoms

Colon irrigation is sought after for a variety of reasons by clients suffering from a wide range of health problems. In a survey conducted by I-ACT to find out the reasons why clients seek out colon hydrotherapy, constipation was one of the most common reasons given.

Many of the health conditions listed have an underlying bowel related problem. Often there is a problem of constipation that the individual is unaware of. Others complain of digestive symptoms such as bloating, flatulence and gas distension but do not relate it to bowel dysfunction.

In many cases, colon hydrotherapy offers relief by helping to address the underlying bowel dysfunction.

Health problems for which colon hydrotherapy offers good relief include :

- Indigestion
- Gas problem
- Irritable bowel syndrome
- Functional bowel disorder
- Others

Colon Hydrotherapy

- Bowel preparation

Bowel preparation is required prior to a number of procedures on the gastro-intestinal tract. Such procedures include surgery of the bowel, radiological studies and endoscopy of the digestive tract.

Most individuals are familiar with the requirement for colon cleansing prior to colonoscopy. Doctors also have a range of options available for this purpose.

There are various reasons why an alternative option that is safe and effective can be useful. Common situations when colon hydrotherapy may be used as an alternative prep include :

A) Inadequate Bowel Preparation from other preparations. This may arise because of poor compliance with standard protocol, inadequate instructions, inability to tolerate dosing, etc.

B) Need for selective bowel preparation due to health issues:

- Elderly Patients – risk of phosphate intoxication due to decreased renal function, concomitant medication and other gastrointestinal disorders.
- Underlying Inflammatory Bowel Disease.
- Diabetes Mellitus
- Pregnancy
- Pediatric Population
- Chronic constipation with very dry and impacted bowels
- Unstable health problem such as hepatic, renal or cardiac dysfunction.
- When there is contraindications or concerns of electrolyte imbalance as in the caswe of elderly patients with cardiac failure, unstable angina, myocardial infarction, ileus, malabsorption, acites, etc.

Recent reports of the use of colon hydrotherapy as preparation for colonoscopy has shown positive results. Report from Danbury Hospital by a Gastroenterologist using colon hydrotherapy as preparation for colonoscopy gave very positive results in over a hundred patients.

EVIDENCE BASED APPROACH TO PRACTICE

In order to gain recognition for the practice of colon hydrotherapy, there is only one direction to follow – the evidence based approach.

It is critically important to initiate actions that will establish the safety and efficacy of the procedure. This can only be done through formal clinical studies and research.

Effort must be taken to explore the clinical application of colon irrigation in the management of different health problems. Such effort must identify and illustrate the advantage and benefits derived by using colon hydrotherapy to complement existing management options.

For example, in the management of constipation, colonic irrigation provide a means of hydrating the colon to soften and loosen waste. It also offers the opportunity to stimulate peristalsis that support evacuation of bowel contents.

These points are factual and clear and cannot be disputed. What is necessary though is to determine through clinical studies how the procedure offers an advantage over existing options such as laxatives etc.

SCIENTIFIC DOCUMENTATION OF RESULTS IMPERATIVE

There is a dire need to encourage clinical research about the safety and efficacy of colon hydrotherapy and its therapeutic potentials.

To attain this, the following actions need to be established.

- a) Publications that highlight the benefits of the procedure
- b) Articles to provide useful information to professionals
- c) Case studies report to illustrate the results of the procedure with discussion on its role in supporting case management

- d) Closer and more frequent interaction with medical community to be established
- e) Compilation of reference materials relating to the procedure and its potential effects and benefits.

Without taking an evidence based approach, there will always be suspicion and bias against a procedure that medical professionals are not familiar with. Currently, medical consideration of the procedure is that it is simply a procedure to irrigate the colon with water to support evacuation of lower bowel content.

Until and unless they are aware that colon irrigation can offer results beyond cleaning the lower bowels, and realize the benefit of the potential for hydration, activation of bowels and supporting the evacuation of bowel contents, the procedure will be relegated to a secondary and perhaps unnecessary role in the total management of a client with bowel problems – not to mention those with systemic problems.

Clinical studies and research trials will require time (in terms of years) and major resources of money and expertise. Even if funds are available, the approach to it must remain rationale and methodical. There will be a need to establish standards and create a consensus to reflect the professionalism of those in practice.

This must be coupled with available expertise to standardize the procedure and ensure a uniform approach to support the results of safety and efficacy. There will be the need to seek the support of external agencies to assist with research protocol design, statistical analysis and research administration.

However issues relating to the practical aspects of the procedure must be standardized and agreed upon by those who are experienced in the practice of this procedure.

MEDICAL COMMUNICATION

When communicating with the medical community, it is critical to present it along a line of argument that is familiar to them. In most instances, spelling out

the FEATURES, ADVANTAGES and BENEFITS is the line of approach.

Features

- Colon irrigation is carried out to flush the colon to promote evacuation of the contents of the lower bowel.
- Its effects are to hydrate (improve transit), activate (stimulate peristalsis) and evacuate (overcome stagnation).

Advantages

- It is a simple, safe and effective procedure carried out by a certified therapist using modern (FDA registered) instruments.

Benefits of colon hydrotherapy, when medically indicated, might include:

- It can offer immediate relief
- It can offer on-going improvement
- It offers positive effects on bowel function – hydrate, activate, evacuate
- It presents an opportunity to assess bowel function :
 - Level of hydration
 - Contractibility
 - Level of stagnation
- It complements the management of certain health conditions when current therapy remains ineffective or unsatisfactory
 - Chronic constipation
 - IBS and other functional bowel diseases
 - As an alternative bowel preparation for procedures
 - Cases unable to tolerate standard prep
 - Cases where more aggressive prep required
 - To avoid unwarranted surgery
 - Chronic and long standing bowel problems

The challenge ahead lies in promoting professionalism and standards in the practice of colon hydrotherapy to achieve greater credibility as well as acceptance by both medical and regulatory authorities.

INDICATIONS & CONTRAINDICATIONS / PRECAUTIONS

Indications

For the Class II device, the FDA approves Colon Cleansing when medically indicated such as before radiological or endoscopic examination.

Contraindications

Although the procedure is simple and easy to carry out, every colon therapist must be alert to situations when the procedure should not be carried out. The practitioner must use the contraindication list as provided by the manufacturer for their equipment.

This list may include:

- uncontrolled hypertension or congestive heart failure
- aneurysm
- severe anemia
- gastrointestinal hemorrhage or perforation
- severe hemorrhoids
- renal insufficiency
- cirrhosis
- carcinoma of the colon
- fissures or fistulas
- Crohn's disease
- abdominal hernia
- recent colon surgery
- first and third trimester of pregnancy

Over time, I have developed the following guidelines:

1. Malignancy of the Intestinal tract
2. Any gastrointestinal disorder that makes perforation a likelihood.
3. Any disease, such as severe haemorrhoids, strictures, fissures, etc
4. High blood pressure
5. Severe cardiovascular disease
6. Abdominal aneurysms and arteriosclerosis, phlebitis, thrombosis, or where there is a tendency to haemorrhage
7. Severe debilitating diseases.
8. Severe anaemias and exophthalmic goitre

The presence of any of these contra-indications will

require the client to be referred by the colon therapists to a qualified physician for further investigations and management before colon hydrotherapy can be considered.

It is important to note that the procedure of colon hydrotherapy should never be carried out in a client who has an unstable clinical condition.

Precautions

Special care and attention must be taken when offering the service to certain clients. These include :

- Elderly
- Children
- Frail
- Disabled
- History of fits
- Grossly obese
- Highly anxious
- Multiple health problems

These clients may have certain health conditions or requirements that demand more diligent care and attention.

Care should always be exercised, and manufacturer guidelines followed, to minimize the possibility of the following adverse events:

- injury / perforation
- water intoxication
- electrolyte imbalance
- infection

Drug Interactions

Useful Drug Information for Colon Hydrotherapists

NSAIDs

Non-steroidal anti-inflammatory Drugs are commonly prescribed for treatment of pain and inflammation eg. joint pain, arthritis, gout, back-ache, sports injury, menstrual pain, headaches etc. As a group of drugs, they are taken regularly by approximately 33 million Americans.

Common examples of NSAIDs are :

Aspirin salsalate (Amigesic), diflunisal (Dolobid), ibuprofen (Motrin), ketoprofen (Orudis), nabumetone (Relafen), piroxicam (Feldene), naproxen (Aleve, Naprosyn,) diclofenac (Voltaren), indomethacin (Indocin), sulindac (Clinoril), tolmetin (Tolectin), etodolac (Lodine), ketorolac (Toradol), oxaprozin (Daypro), celecoxib (Celebrex).

Side effects of NSAIDs

Major side effects of NSAIDs are on the gastrointestinal system. Between 10%-50% of patients experiences side effects such as abdominal pain, diarrhea, bloating, heartburn, and indigestion. A smaller percentage taking NSAIDs long-term run the risk of developing stomach and duodenal ulcers with additional risk of complications such as bleeding or perforation.

These side effects of NSAIDs are attributed to its mechanism of action. The body produces prostaglandins, chemical agents involved in the natural physiological inflammatory response. Prostaglandins are produced in cells by the enzyme cyclooxygenase (COX). There are two types of cyclooxygenase enzymes : COX-1 and COX-2. Both enzymes produce prostaglandins that promote inflammation, pain, and fever. However, only COX-1 produces prostaglandins that support platelets and protect the stomach.

Common anti-inflammatory drugs like aspirin and ibuprofen block both COX-1 and COX-2 en-

zymes and reduce prostaglandins throughout the body. As a consequence, ongoing inflammation, pain, and fever are reduced.

However by reducing prostaglandins (blocking of COX-1 enzyme) in the stomach, the protective action of prostaglandin on the stomach and its beneficial effects on platelets and blood clotting is compromised, resulting in risk of stomach ulceration and bleeding.

Newer NSAIDs are Cox-2 inhibitors

New generations of NSAIDs are more specific in actions. These drugs are uniquely different from traditional NSAIDs by selectively blocking the COX-2 enzyme and not the COX-1 enzyme.

By blocking only the COX-2 enzymes which impede the production of prostaglandins in the body it reduces pain, swelling and inflammation without causing adverse effects in the stomach (no action of COX-1 enzymes and thus no reduction of prostaglandin in the stomach). Selective COX-2 inhibitor such as Celebrax (celecoxib) is therefore less likely to cause bleeding and ulcers.

Other side effects of NSAIDs

NSAIDs also causes some common side effects such as nausea, vomiting, diarrhea, constipation, decreased appetite, rash, dizziness, headache, and drowsiness and edema. The more serious side effects include kidney failure, liver failure, ulcers and prolonged bleeding after an injury or surgery. In spite of the lower incidence of adverse effects with the use of COX-2 inhibitors, FDA has issued guidelines regarding its use. These guidelines are based on the latest available scientific data that indicate an increased risk of cardiovascular (CV) events and gastrointestinal (GI) bleeding associated with their use.

PREDNISONONE

Prednisolone is a steroid. It is a life saving drug in various medical conditions such as bronchial

asthma, anaphylaxis and shock conditions. It is also a drug commonly prescribed for chronic health conditions including psoriasis, rheumatoid arthritis, osteoarthritis, gout and various inflammatory disorders.

The problem with the use of this drug is that it can aggravate some medical conditions such as diabetes, osteoporosis, hypertension, glaucoma, peptic ulcers and cause the trigger an infection etc.

Its wide clinical efficacy in many health conditions makes it a common prescription drug. While it is useful in the resolution of many health problems, it is a drug that is overused and abused.

Long term use can suppress immunity resistance and lead to fluid accumulation as well as Cushing's syndrome.

Drug interactions with other drugs such as barbiturates, rifampicin, cyclosporine, NSAIDs, antacids and insulin can result in elevation of drug concentration or enhancement of toxicity of other drugs. Any patients on prednisone (or other formulation of steroids) should be monitored closely to ensure that there is a need to maintain good therapeutic control of their health conditions while undergoing colon hydrotherapy.

ATORVASTATIN (lipitor)

Atorvastatin is an oral drug that lowers the level of cholesterol in the blood. It belongs to a class of drugs referred to as statins, which includes lovastatin (Mevacor), simvastatin, (Zocor), fluvastatin (Lescol), and pravastatin (Pravachol).

All statins, including atorvastatin, prevent the production of cholesterol in the liver by blocking HMG-CoA reductase, an enzyme that makes cholesterol. Statins reduce total cholesterol as well as LDL cholesterol in blood. LDL cholesterol is believed to be the "bad" cholesterol that is primarily responsible for the development of coronary artery disease. Reducing LDL cholesterol levels

retards progression and may even reverse coronary artery disease. Atorvastatin also reduces the concentration of triglycerides in the blood and raises the concentrations of HDL ("good") cholesterol. High blood concentrations of triglycerides also have been associated with coronary artery disease.

Atorvastatin has also been proven in clinical studies to prevent angina, stroke, heart attack, hospitalization for congestive heart failure, and revascularization procedures in individuals with coronary heart disease. It can reduce the risk of myocardial infarction, stroke, angina and revascularization procedures in adults with multiple risk factors for coronary artery disease.

Problem with the use of Atorvastatin lies in its sides effects. This is attributed to several factors, one of which is DRUG INTERACTIONS. Decreased elimination of atorvastatin could increase levels of atorvastatin in the body and increase the risk of muscle toxicity from atorvastatin. Therefore, atorvastatin should not be combined with drugs that decrease its elimination. Examples of such drugs include erythromycin (E-Mycin), ketoconazole (Nizoral), itraconazole (Sporanox), clarithromycin (Biaxin), telithromycin (Ketek), cyclosporine (Sandimmune), nefazodone (Serzone), and HIV protease inhibitors such as indinavir (Crixivan) and ritonavir (Norvir).

Large quantities of grape fruit juice (>1.2 liters daily) also will increase blood levels of atorvastatin.

Amiodarone (Cordarone), verapamil (Calan Verelan, Isoptin), cyclosporine (Sandimmune), niacin (Niacor, Niaspan, Slo-Niacin), gemfibrozil (Lopid) and fenofibrate (Tricor) also may increase the risk of muscle toxicity when combined with atorvastatin. Atorvastatin increases the effect of warfarin (Coumadin) and the blood concentration of digoxin (Lanoxin). Patients taking atorvastatin and warfarin or digoxin should be monitored carefully. Cholestyramine (Questran) decreases the absorption of atorvastatin. Atorvastatin should be given at least two hours before and at least four

hours after cholestyramine.

PREGNANCY: Atorvastatin should not be taken during pregnancy because the developing fetus requires cholesterol for development, and atorvastatin reduces the production of cholesterol. Atorvastatin should only be administered to women of childbearing age if they are not likely to become pregnant.

SIDE EFFECTS: Atorvastatin is generally well-tolerated. Minor side effects include constipation, diarrhea, fatigue, gas, heartburn, and headache. Atorvastatin may cause liver and muscle damage. Serious liver damage caused by statins is rare.

METHOTREXATE

Methotrexate is an example of an extremely toxic drug prescribed for treatment of various cancer. It is also indicated in treatment of rheumatoid arthritis and psoriasis.

There are numerous side effects such as stomatitis, nausea, malaise, fatigue, headache etc as well as infections due to immune suppression. Serious adverse reactions include: bone marrow suppression, liver, lung and kidney toxicity. Unexpected severe (sometimes fatal) bone marrow suppression, aplastic anemia and gastrointestinal toxicity have been reported with concomitant administration of methotrexate (usually in high dosage) along with some nonsteroidal anti-inflammatory drugs (NSAIDs).

It is thus important for colon hydrotherapists to be aware that any patients on methotrexate therapy should be handled with care and to ensure that their health conditions are stable before proceeding with colon hydrotherapy.

PLAVIX (clopidogrel)

Plavix is a drug prescribed to keep the platelets in your blood from coagulating (clotting) so as to prevent unwanted blood clots that can occur with

certain heart or blood vessel conditions.

Plavix is used to prevent blood clots after a recent heart attack or stroke, and in people with certain disorders of the heart or blood vessels.

Because of this drug action, Plavix may cause bleeding problem even from a minor injury. It can present as bleeding within the digestive tract – stools are black and/or vomit is coffee ground color. These are signs of bleeding in your digestive tract.

Avoid drinking alcohol while taking Plavix. Alcohol may increase the risk of bleeding in your stomach or intestines.

Clients intending to undergo any type of surgery or dental work should inform their surgeon or dentist about the use of Plavix. They will need to stop using the medicine for at least 5 days before having surgery, to prevent excessive bleeding.

While taking Plavix, avoid taking aspirin or other NSAIDs (non-steroidal anti-inflammatory drugs) unless under doctor's advice. NSAIDs include ibuprofen (Motrin, Advil), naproxen (Aleve, Naprosyn), diclofenac (Voltaren), diflunisal (Dolobid), etodolac (Lodine), flurbiprofen (Ansaid), indomethacin (Indocin), ketoprofen (Orudis), ketorolac (Toradol), mefenamic acid (Ponstel), meloxicam (Mobic), nabumetone (Relafen), piroxicam (Feldene), and others.

If clients are taking Plavix (clopidogrel), be aware of the increase risk of bleeding in such clients and advise them to seek treatment accordingly, if there are warning signs of any bleeding problems.

WARFARIN (coumadin)

Warfarin (coumadin) is a drug prescribed to prevent clotting especially in cases at risk of suffering from thrombosis or high risk of embolism. These can be cases of strokes, heart disease, peripheral arterial disorders or atrial fibrillation.

There may also be side effects such as nausea, abdominal discomfort and hypersensitivity to warfarin.

The importance though is the risk of haemorrhage in such cases during any procedure or injury. Due to the possibility of bleeding from haemorrhoids or problem of rectal bleed during colon hydrotherapy session, it is important for a colon hydrotherapist to be aware of this problem in patients taking warfarin.

DIGOXIN

Digoxin is a very useful drug in the treatment of various heart conditions. Derived from the foxglove plant, its medicinal properties have been documented since the late 18th century. Digoxin is recommended for use in treatment of heart problems such as atrial fibrillation, congestive heart failure (CHF) etc.

In spite of its usefulness, one problem with digoxin lies in its narrow therapeutic window leading to risk of drug toxicity. (ie. a very small range of dosage before it manifests toxicity which can be serious and fatal).

Approximately 0.4% of all hospital admissions are related to digitalis toxicity. Of people in nursing homes, 10 to 18% develop this toxicity. According to a large study published in 1990, definite digoxin toxicity occurred in 0.8% of patients with heart failure treated with digoxin.

One of the most common precipitating cause of digitalis intoxication is the lack of potassium stores in the body. This occurs often in patients with heart failure as a result of diuretic therapy and secondary hyperaldosteronism.

Another cause is drug interactions. A number of drugs are known to potentiate digoxin toxicity. These include the following:

- o Quinidine
- o Erythromycin

- o Verapamil, diltiazem, nifedipine
- o Captopril
- o Anticholinergic drugs
- o Ibuprofen
- o Amiodarone

Therapist managing clients who have heart disease or atrial fibrillation, should take a detailed drug history and advise clients to seek medical attention.

LASIX (Frusemide)

Lasix is a very useful drug to prevent the body from absorbing too much water.

It is generally prescribed for congestive heart failure, liver disease, or kidney disorders.

Side effects of Lasix may include:

- o dry mouth, thirst, nausea, vomiting;
- o feeling weak, drowsy, restless, or light-headed;
- o fast or uneven heartbeat;
- o muscle pain or weakness;
- o urinating less than usual or not at all;
- o easy bruising or bleeding, unusual weakness;
- o a red, blistering, peeling skin rash;
- o hearing loss; or
- o stomach pain, low fever, loss of appetite, dark urine, clay-colored stools, jaundice (yellowing of the skin or eyes).

Clients on Lasix should be referred to the referring Health Care practitioner prior to the session.

CARVEDILOL (Coreg)

Carvedilol (Coreg) is a prescription medicine prescribed commonly for treatment of hypertension and congestive heart failure. It belongs to a class of drugs known as the beta blockers.

There are a number of known side effects. These include :

- Dizziness
- Low blood pressure
- Diarrhea
- High blood sugar
- Increase in weight
- Slow heart rate
- Nausea
- Insomnia
- Drop in blood pressure when standing from either a sitting or lying-down position.

Due to the possibility of drug interaction with a large number of drugs – including heart medication, anti-depressants, NSAIDs etc, a careful drug history must also be taken from clients.

I- ACT COLON HYDROTHERAPY

Generic Operating Protocols and Equipment Distinctions

This chapter will provide the instructions for operating, cleansing, and maintenance each type of FDA registered equipment from a general perspective. It is imperative you refer to the specific operating instructions provided by the manufacturers of your equipment.

These procedures are for a nominal closed and a nominal open system.

Class 1 equipment as defined by the FDA:

From the code of federal regulations (CFR) 876.5210 Enema Kit.

(a) Identification. An enema kit is a device intended to instill water or other fluids into the colon through a nozzle inserted into the rectum to promote evacuation of the contents of the lower colon. The device consists of a container for fluid connected to the nozzle either directly or via tubing. This device does not include the colonic irrigation system (Sec. 876.5220).

(b) Classification. Class I (general controls). The device is exempt from the premarket notification procedures in subpart E of part 807 of this chapter subject to Sec. 876.9. The device is exempt from the current good manufacturing practice regulations in part 820 of this chapter, with the exception of Sec. 820.180 of this chapter, with respect to general requirements concerning records, and Sec. 820.198 of this chapter, with respect to complaint files. [48 FR 53023, Nov. 23, 1963, as amended at 65 FR 2317, Jan. 14, 2000]

This equipment is for “over-the-counter” use, and required no prescription. It is highly recommended that the user seek information from their health care provider prior to using any Class 1 device.

With this type of device it is recommended that the “nozzle” be discarded and replaced after each use.

Class II Equipment is defined by the FDA as:

Colonic Irrigation System

From the code of federal regulations (CFR)Sec. 876.5220 Colonic irrigation system.

(a) Identification. A colonic irrigation system is a device intended to instill water into the colon through a nozzle inserted into the rectum to cleanse (evacuate) the contents of the lower colon. The system is designed to allow evacuation of the contents of the colon during the administration of the colonic irrigation. The device consists of a container for fluid connected to the nozzle via tubing and includes a system which enables the pressure, temperature, or flow of water through the nozzle to be controlled. The device may include a console-type toilet and necessary fittings to allow the device to be connected to water and sewer pipes. The device may use electrical power to heat the water. The device does not include the enema kit (Sec. 876.5210).

(b) Classification. (1) Class II (performance standards) when the device is intended for colon cleansing when medically indicated, such as before radiological or endoscopic examinations. (2) Class III (premarket approval) when the device is intended for other uses, including colon cleansing routinely for general well being.

(c) Date PMA or notice of completion of a PDP is required. A PMA or a notice of completion of a PDP is required to be filed with the Food and Drug Administration on or before December 26, 1996 for any colonic irrigation system described in paragraph (b)(2) of this section that was in commercial distribution before May 28, 1976, or that has, on or before December 26, 1996 been found to be substantially equivalent to a colonic irrigation system described in paragraph (b)(2) of this section that was in commercial distribution before May 28, 1976. Any other colonic irrigation system shall have an approved PMA in effect before being placed in commercial distribution. [48 FR 53023, Nov. 23, 1983, as amended at 52 FR 17738, May 11, 1987; 61 FR 50707, Sept. 27, 1996]

This type of equipment (Class II) requires physician order to purchase, and for the procedure, it is intended to be used “when medically indicated”.

Class III equipment is intended for other uses - such as for maintaining “general well being”. As of the time of this writing, there are no Class III devices available as there have been no peer reviewed studies to document that colon hydrotherapy has any value in maintaining or improving general health or well being.

While most colon hydrotherapists can vouch for the value of the modality, since here have not been any studies to validate the value, we cannot make any claims about the value.

Following are the current I-ACT policies on equipment:

I-ACT recommends the use of currently registered FDA equipment and only disposable speculums, rectal tubes, or rectal nozzles. However, should the Therapist use reusable speculums, these speculums should, at a minimum, be autoclaved for sanitation and cleanliness (30 minutes). Additionally, the autoclave unit must be tested and inspected by competent authority at least four times per year- maintain documentation. (Under NO conditions should a disposable speculum or rectal tube be reused).

I-ACT recognizes there are two distinct types of equipment, open and closed systems. However, it is I-ACT policy that the colon hydrotherapist / technician is always in attendance / or is immediately available to the client throughout the session. The degree of assistance is to be in compliance with the instructions of the manufacturer of the equipment as registered with the FDA, and/or as directed by a physician.

Additionally, I-ACT recommends each therapist not using FDA registered equipment consider upgrading their equipment to FDA registered equipment in the very near future.

The Class II equipment is currently divided into two categories - Closed and Open. It is I-ACT policy that both types of equipment are appropriate and both have value. It is simply the desire of the practitioner that determines the type of equipment they choose to use.

In order to ensure the safety to the public, in all cases it is mandatory that the policies and the procedures of the manufacture of the equipment used be followed without variation.

For educational purposes only, and to attempt to provide information to the profession about the functioning of generic equipment, the following samples operating instructions are provided.

GENERIC OPERATING PROTOCOLS

- STOMACH ASSESSMENT -
- PRIOR TO THE SESSION -

(Always follow the manufacturer guidelines for your type of equipment, the following information is generic and for educational value only. This information is applicable to all Colon Hydrotherapy devices.)

When the client is on the table and just prior to starting the session, the Colon Hydrotherapist should do a preliminary assessment of the stomach.

Notify the Client that you are going to do an assessment of the stomach which will require you to touch the stomach. Explain that you will press lightly on the stomach and you would like the client to report if there is any pain or discomfort.

With your hands on the outside of the sheet, robe, or towel that is used to cover the client, gently place your hands on the stomach. Starting at the ileocecal valve (area of the appendix) slowly press over the area and release. Slowly move up the colon to the hepatic flexure, across the transverse colon, to the splenic flexure and then down the colon to the sigmoid curve ending at the rectum.

If you identify any masses, or if the client reports any severe discomfort, then terminate the session and refer the client back to the referring health care provider for further evaluation.

If the assessment was unremarkable, then proceed with the session as instructed in the prescription.

GENERIC OPERATING PROTOCOLS - CLOSED SYSTEMS

(Always follow the manufacturer guidelines for your type of equipment, the following information is generic and for educational value only. This information is applicable to equipment similar to that manufactured by Clearwater, Dotolo Research, Transcom, & Specialty Health)

1. WATER TEMPERATURE: 98°F - 102°F
2. FILL CYCLE (by manufacturer):
 - Clearwater equipment: initiate fill at 0 and allow fill to continue to 1.5 - 2.0 lb psi (max)
 - Dotolo equipment: initiate fill at appx 1/4-1/2lb psi allow fill to continue to 1.5 - 2.0 lb psi (max)
 - Specialty Health equipment: initiate fill at appx 1/4-1/2lb psi allow fill to continue to 1.5 - 2.0 lb psi (max)
3. EVACUATION CYCLE (by manufacturer):
 - Clearwater equipment: 2.0 psi to 0
 - Dotolo equipment: 1.5 - 2.5 lbs PSI
 - Specialty Health equipment: 1.5 - 2.5 lbs PSI
4. FREQUENCY (FILL/EVACUATION CYCLE): Repeat Fill (Inflow) and Evacuation (Outflow) approximately every 5 minutes or dependent on client comfort

5. DURATION: Time required for administration is normally based upon the needs of the client (30 - 45 minutes), will not exceed 45 minutes.

6. SANITIZING / DISINFECTING: Sanitize and disinfect according to manufacturer guidelines.

GENERIC OPERATING PROTOCOLS - OPEN SYSTEMS

(Always follow the manufacturer guidelines for your type of equipment, the following information is generic and for educational value only. This information is applicable to equipment similar to that manufactured by Colon Therapeutics, Lifestream, & Tiller MIND BODY)

1. WATER TEMPERATURE: 98°F - 102°F
2. WATER FLOW: Establish flow rate at comfortable level for client (ensure water is flowing into client)
3. DURATION: Time required for administration is normally based upon the needs of the client (30 - 45 minutes), will not exceed 45 minutes.
4. SANITIZING / DISINFECTING: Sanitize and disinfect according to manufacturer guidelines.

I- ACT COLON

The Healthy Digestive System

It is estimated that as much as 40% of the population suffer from some form of digestive stress. If you are reading this book, you probably are within this group. You may be unconcerned with the details of the digestive process or just want to know how to be or become healthy. If that is your goal, then the journey to achieving that goal begins with a clear understanding of a healthy digestive system.

What Is Digestion?

Digestion encompasses the chemical and motor (physical motion) activities that separate food into its most basic components so that they can be absorbed through the lining of the small intestine. Digestion is the process of converting food into chemical substances that can be absorbed and assimilated. It begins in the mouth and ends in the large intestine or colon.

What Does the Digestive System Do?

The digestive system has two broad functions: The first and best known is the digestion and absorption of food. The second function is the excretion of wastes. Both of these occur primarily in the small and large intestines; hence the phrase by Gloria Gilbère, ND (Naturopathic Doctor), "The road to health is paved with good intestines."

What Organs Make Up the Digestive System?

The digestive tract is a tube (about 30 feet long) that begins with the mouth and ends with the anus. The digestive system (or gastrointestinal tract) is made up of the mouth, esophagus, stomach, small intestine, large intestine and anus. Along this tube are accessory organs like the teeth, tongue, salivary glands, gallbladder, liver and pancreas.

What Are the Functions of the Digestive System?

The digestive tract has three primary functions:

- Motor – assisting food movement
- Secretory – preparing food for absorption

by producing digestive enzymes

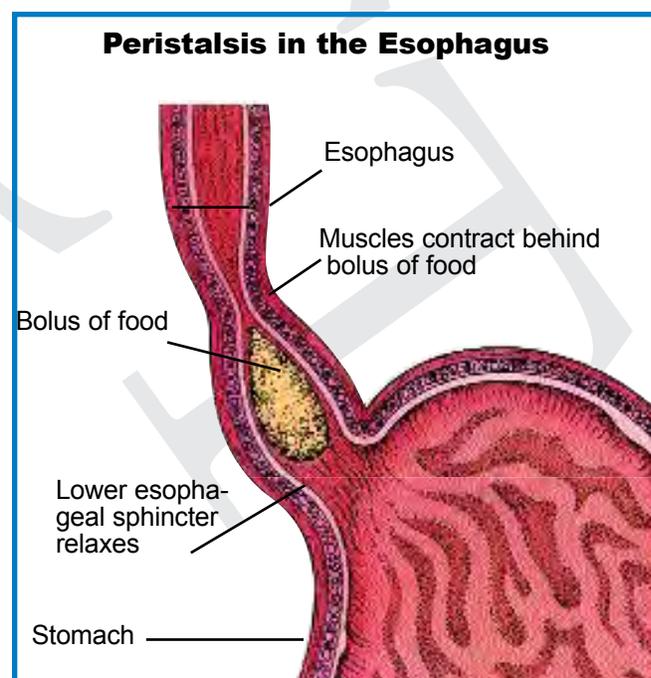
- Absorptive – breaking food down and converting it into substances that can be absorbed through digestion

The Digestive Process

Digestion begins in the mouth where the teeth chew food into smaller particles. Then saliva coats and softens those food particles with enzymes (ptyalin and amylase) that break down carbohydrates (starches and sugars). Saliva also contains enzymes, such as lysozyme, that attack bacteria and their protein coats directly. This is the body's first line of defense against parasites and foreign invaders. Once chewing is completed (and sometimes even when it is not), food is swallowed and transferred down the esophagus to the stomach.

The Esophagus

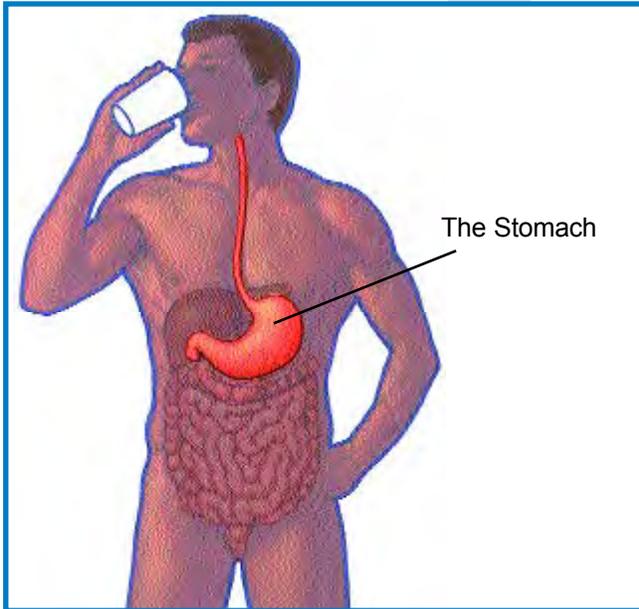
The esophagus is a 10-inch long muscular tube, lined with mucus-producing cells, which lubricates the food so that it passes through with ease. The esophagus transports food to the stomach through the action of its wave-like muscular contractions (peristalsis). It is coated with a protective mucous lining. The muscular valve at



the bottom of the esophagus is known as the lower esophageal sphincter. This valve remains tightly closed when food is not being eaten so that stomach acid cannot back into the esophagus and cause heartburn. It opens and closes quickly to allow food to pass into the stomach.

The Stomach

Many people are surprised to find that very little absorption actually occurs in the stomach. The mucous cells of the stomach can absorb some water, short-chain fatty acids and certain drugs, such as alcohol and aspirin, but the stomach is essentially a holding and mixing tank for food. Its main functions are storage and preliminary digestion. The stomach functions like a big blender, churning and liquefying food. The properly functioning stomach secretes five important substances: (1) mucus, (2) hydrochloric acid (HCl), (3) a precursor of the protein-digesting enzyme pepsin, (4) gastrin, a hormone to regulate acid production and (5) gastric lipase, which as-



sists in the digestion of fat.

A mucous lining coats the cells of the stomach to protect them from the HCl and enzymes that must be present for proper digestion. This alkaline mucous lining can be damaged by dehydration, over-consumption of food or aspirin, or by

the bacterium *Helicobacter pylori* (*H. pylori*). This damage can often lead to gastritis (irritation of the stomach lining) or to a stomach ulcer.

Hydrochloric acid (HCl) is produced by

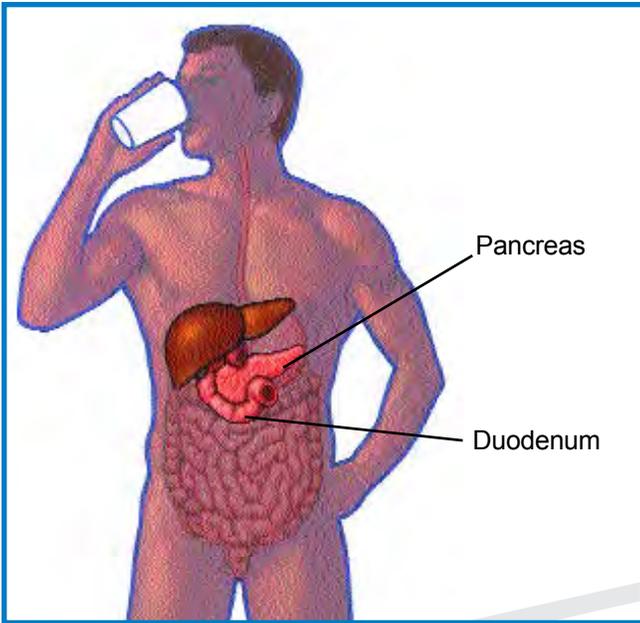
Contrary to popular belief, many Americans who suffer from heartburn produce too little Hydrochloric Acid (HCl), not too much. Without enough HCl, you may not be able to sufficiently break down proteins. This can lead to bloating, gas and heartburn. Low HCl production can also result in problems with bacterial infections or parasites.

parietal cells (tiny pumps) in the lining of the stomach. This acid is needed to ensure the proper functioning of the stomach. HCl has two primary functions: It provides the acidic environment necessary for the enzyme pepsin to break down proteins; and it helps prevent infection by destroying most parasites and bacteria.

At the end of the stomach is the pyloric sphincter, which controls the opening between the end of the stomach and the duodenum, the first section of the small intestine.

The Duodenum

When food leaves the stomach, it enters the first section of the small intestine known as the duodenum. It is now called chyme, a mixture of food, HCl and mucus, which is approximately the consistency of split pea soup. As the duodenum fills, hormones released from the duodenal lining (1) delay gastric emptying, (2) promote bile flow from the liver and gallbladder and (3) promote secretion of water, bicarbonate and potent digestive enzymes from the pancreas. The surface of the duodenum is smooth for the first few inches, but quickly changes to a surface with many folds and small finger-like projections called villi or microvilli (very small projections). These projections serve to increase the surface area and absorption capabilities of the duodenum. Properly functioning accessory organs (liver, gallblad-



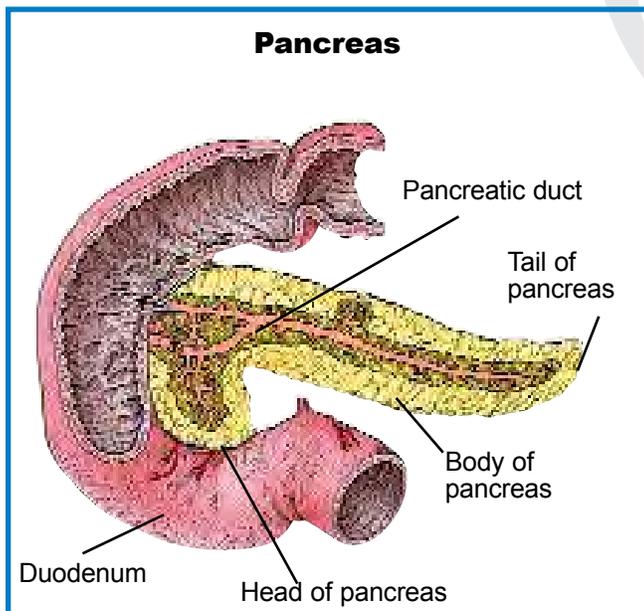
der and pancreas) are crucial during this first stage of digestion.

The Pancreas

The pancreas is a 6-inch long accessory organ that has three main functions important to digestion:

1. Neutralizes stomach acid
2. Regulates blood sugar levels
3. Produces digestive enzymes

Digestive enzymes digest proteins, carbohydrates and fats. The proteolytic (protein-digesting pancre-



atic) enzymes are secreted in an inactive form and are only activated once they reach the duodenum. The other pancreatic enzymes are secreted in an active form but require ions (electrically charged molecules) or bile to be present for optimal activity. Bicarbonates are alkaline and serve to neutralize stomach acid and activate digestive enzymes. These secretions (pancreatic enzymes and bicarbonates) are delivered directly into the duodenum, the upper portion of the small intestine. The pancreas also secretes hormones, which help manage blood sugar levels, directly into the bloodstream. These hormones are insulin (sugar lowering) and glucagon (sugar raising).

The Liver and Gallbladder

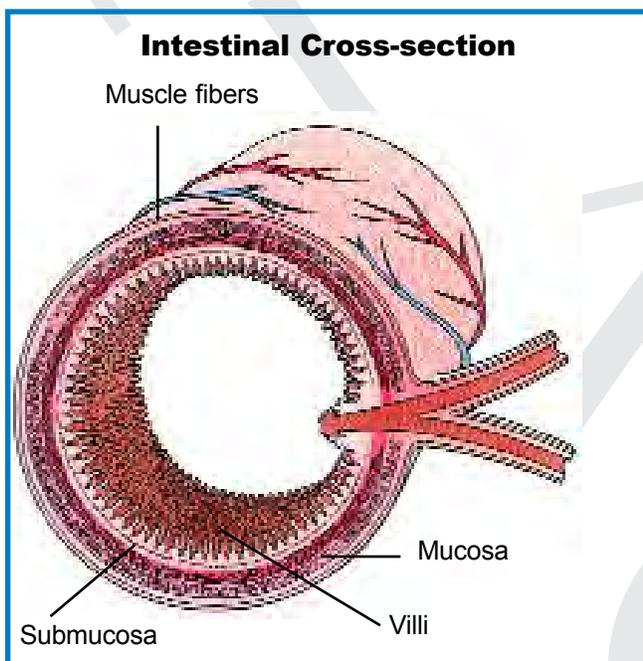
The liver has several important functions, many of which are related to digestion. It produces about half the body's cholesterol (the rest comes from food). About 80% of the cholesterol produced by the liver is used to make bile. Bile is composed of bile salts, hormones and toxins. It acts to emulsify and distribute fat, cholesterol and fat-soluble vitamins throughout the intestines. Bile is an alkaline substance that neutralizes stomach acid. Between meals, it is stored in the gallbladder, a pear-shaped organ located just below the liver. When food (chyme) enters the duodenum, a signal is sent to the gallbladder to contract, thereby releasing bile into the small intestine.

The Small Intestine

Ninety percent of all nutrients are absorbed in the small intestine, the body's major digestive organ. The small intestine resembles a coiled hose and is approximately 20 feet long. It is here that most food is completely digested and absorbed. The small intestine contains cells that serve many functions: Some produce mucus, some make enzymes, some absorb nutrients and others are capable of killing bacteria. The cells are arranged in folds upon folds, which force the chyme to move slower so it can be broken down completely and absorbed. These folds also increase the surface area

of the mucosa, the thin mucous membrane lining the walls of the small intestine.

The small intestine consists of three sections – the duodenum, the jejunum and the ileum. The duodenum (first foot of the small intestine) connects to the jejunum, which in turn connects to the ileum. The duodenum primarily absorbs minerals. The jejunum absorbs water-soluble vitamins, carbohydrates and proteins. The ileum

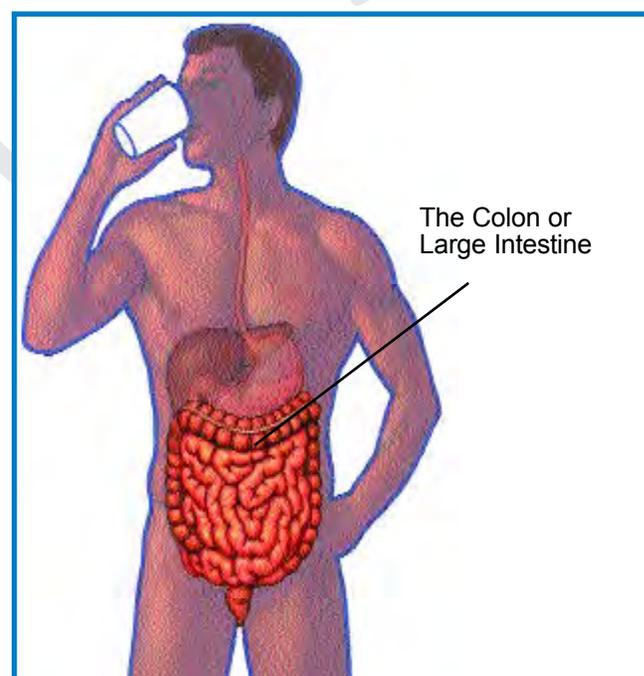


absorbs fat-soluble vitamins, fat, cholesterol and bile salts. The walls of the small intestine secrete alkaline digestive enzymes, which continue the separation of foods – proteins into amino acids, fats into fatty acids and glycerin and carbohydrates into simple sugars.

The Colon or Large Intestine

The last organ through which food residue passes is the colon or large intestine. The three major segments are the ascending (right side of body), transverse (connects right to left side) and descending (left side). Chyme enters the ascending colon through the ileocecal valve (ICV), a one-way valve that connects the small and large intestines and regulates the flow of chyme entering the large intestines. The ICV is designed to let waste pass into

the colon and prevent it from backing into the small intestine. When chyme passes through the ICV, then into the very lowest portion of the ascending colon, known as the cecum, it is still in a liquid state. The cecum is the first section of the five feet of colon. Food waste travels up the ascending colon (through rhythmic waves of contraction or peristalsis), across the transverse and down the descending portion of the organ. As it moves across the transverse colon, liquid is extracted. It is the job of the colon to absorb water and nutrients from the chyme and to form feces. The fecal matter is in a semi-solid state, gradually becoming firmer, as it approaches the descending colon. About two-thirds of stool is water, undigested fiber and food products; one-third is living and dead bacteria (bacteria naturally live in the colon). The lowest portion of the descending colon is the sigmoid.



The sigmoid colon empties into the rectum. In this area, three valves regulate the fecal matter. They are called the valves of Houston. This area is normally empty unless defecation is in process.

Final stages of digestion occur in the colon with the absorption of water and nutrients not absorbed by the small intestine. The liquid and nutrients are absorbed through the intestinal wall, collected by the blood vessels in the wall lining and carried to the liver through the portal vein for filtration.

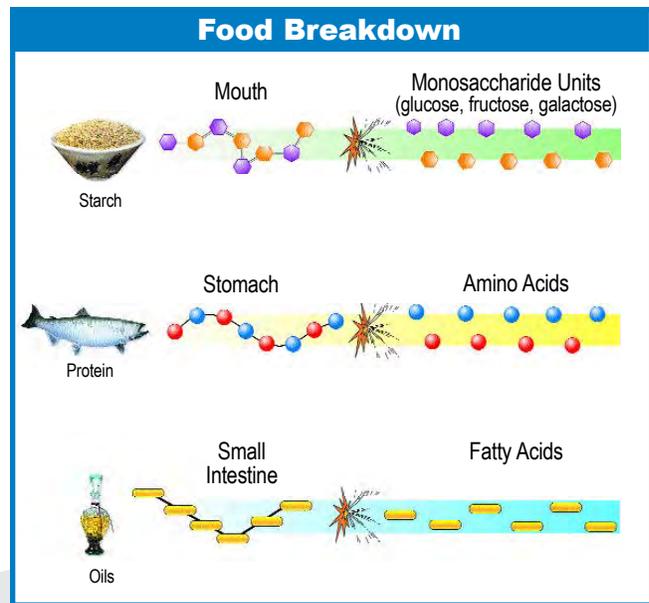
The large intestine also:

1. Secretes bicarbonate to neutralize acid end products
2. Stores waste products, bacteria and intestinal gas
3. Excretes poisons and waste products from the body

The rectum is the chamber at the end of the large intestine. Fecal matter passes into the rectum, creating the urge to defecate. The anus is the opening at the far end of the digestive tract. The anus allows fecal matter to pass out of the body. The anal sphincters keep the anus closed.

The Mucous Membrane

The walls of both the small and large intestines consist of four layers. The innermost layer of the small intestine is called the mucosa. The mucosa has two very important functions: First, it is designed to allow nutrients of the proper size to pass through it and into the bloodstream. Second, the mucosa blocks the passage of undigested food particles, parasites, bacteria and toxins into the bloodstream. Therefore, the mucosa or mucosal lining is a vital part of the body's immune system because it limits the volume of potential invaders. The mucosa is lined with villi and microvilli. The villi are moving absorptive cells that 'suck up' small particles of digested food. On each of the villi are thousands of tiny projections of the membrane of the cell called microvilli. These little

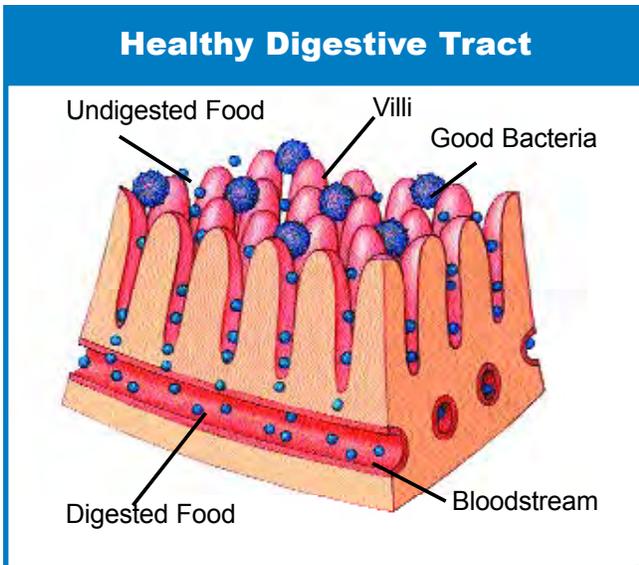


brush-like fuzzy structures (called the 'brush border') further amplify the surface area of the small intestines. Stretched end to end with all its folds, the small intestine has the approximate surface area of a tennis court.

On the surface of this mucosal lining is a thick mucous layer whose surface (the glycocalyx) is highly viscous (slippery). Much of the mucus consists of the amino sugar N-acetyl-glucosamine (NAG). The body makes NAG from the amino acid L-glutamine. L-glutamine exists in virtually all cells, and it is one of the most prevalent amino acids in the body. Humans must have L-glutamine in order to produce NAG and have a healthy mucosal lining. The mucosal lining in a healthy person sheds and then is rebuilt every three to five days. Studies have shown that individuals suffering from any inflammatory bowel disease shed this mucosal layer at a much higher rate. This may be due to an inability to convert L-glutamine into NAG.

The Digestive Environment

It is difficult to fully understand the digestive system without realizing the importance of the bacteria and microbes that live in the intestinal tract. A newborn baby has essentially no digestive bacteria. Within a few hours, the bacteria and



microbes begin to colonize the digestive tract. It has been observed that breast-fed babies develop a larger colony of friendly strains of bifidobacteria than those who are bottle-fed. Ideally, pregnant women should supplement with the friendly bacteria known as *Lactobacillus* (L.) *acidophilus*, and bifidobacteria during the third trimester of pregnancy. Friendly bacteria (also known as probiotics, discussed in chapter 8) are important for babies at the time of birth. *L. acidophilus* in the vagina inoculates the newborn as he/she passes through the birth canal, and it provides protection from other bacteria, as well as assisting with digestion and with the production of vitamins. The bifidobacteria ingested by the mother is concentrated in the breast milk and is passed on intact to the nursing baby. These two events establish the friendly bacteria in the newborn and greatly decrease the possibility of serious infections that can occur during infancy. The mother can provide friendly bacteria for her baby by ingesting a supplement containing *L. acidophilus* and bifidobacteria, or by eating yogurt or kefir with live cultures of these bacteria. It may be best to do both, since it is necessary to provide ample amounts of the probiotics on a regular basis.

These microbes exist throughout the digestive system from the mouth to the anus, but most of the bacteria live in the large intestine. (The stomach is so acidic that almost no bacteria can

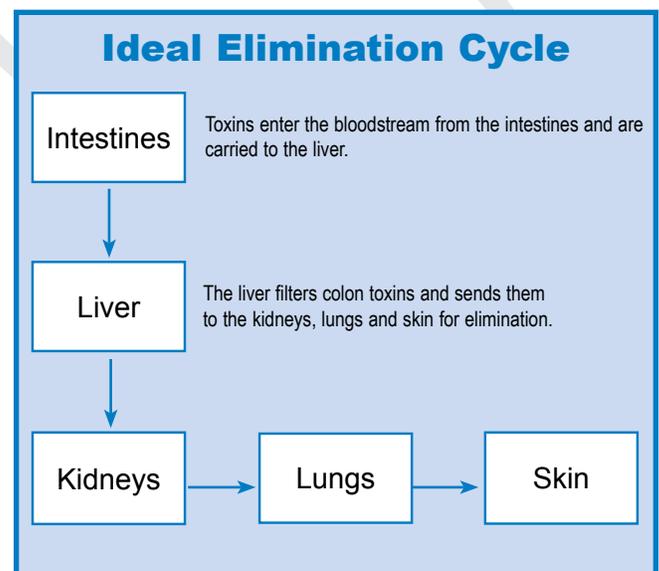
live there.) The large intestine can contain as many as four pounds of these microbial creatures at any one time. Approximately 500 different species of microbes live in the digestive system, but only 30 to 40 species constitute 99% of the microbes in the intestinal tract. In terms of how these microbes affect the body, they can be placed into one of three categories:

1. Good (or symbiotic)
2. Neutral
3. Bad

In a healthy person, there is a ratio of approximately 80–85% combined good and neutral bacteria to 15–20% bad. In many people today, this ratio is reversed. Faulty digestion can contribute to this imbalance.

The good bacteria are sometimes called 'flora' or 'probiotics.' These good bacteria are beneficial because they:

1. Produce enzymes that help digest foods (e.g., lactase enzyme digests milk)
2. Produce the vitamins B, A and K
3. Produce lactic acid, which helps acidify the colon
4. Crowd bad bacteria and keep them from becoming too numerous
5. Produce organic acids that may help with fecal elimination by peristalsis
6. Produce short-chain fatty acids (butyric acid),



which supply energy to intestinal cells

The two most important types of good bacteria are Lactobacillus and Bifidobacteria.

Bad bacteria produce substances that are harmful to the body. They irritate the lining of the intestines (causing gas) and can be absorbed into the bloodstream (causing disease). They cannot always be prevented from entering the body, but if the number of good and neutral bacteria stays high, then, theoretically, the bad bacteria will be kept to a minimum. Examples of bad bacteria are salmonella and H. pylori, the bacterium associated with ulcers.

The neutral bacteria are the most prevalent bacteria in the digestive tract. Neutral microbes have neither a positive nor negative impact. The levels of these three types of organisms remain relatively constant throughout childhood and mid to late adult years. As we age, the levels of bad bacteria often increase, and the good bacteria decrease.

The Signs of Good Digestion and Elimination

At minimum, one should have one good bowel movement per day, but two to three are ideal. A 'good' bowel movement is one that is walnut brown in color, with a consistency similar to toothpaste, about the length of a banana. The stool should be free of odor, leave the body easily, settle in the toilet water and gently submerge. The transit time for food – the elapsed time it takes for a meal to enter the mouth and then exit the rectum – should ideally be less than 24 hours. Transit time is related to exercise and the consumption of fiber and water.

The Seven Channels of Elimination

The seven channels of elimination are:

- Colon
- Blood
- Lungs
- Lymph
- Liver
- Skin
- Kidneys

The first 5 of these channels (column 1) are all organs. The processes of the colon have been explained in this chapter. The liver, the body's primary filtering organ, will be presented in chapter 5. The blood that flows through the vessels of the vascular (blood circulatory) system carries oxygen and nutrients to the cells of the body and removes harmful wastes. Not so familiar to many is the other circulatory system, the lymphatic system, through which lymph flows.

The Lymph

The lymphatic system (figure 9) and the vascular system serve to eliminate poisons from cells. The lymphatic system consists of a network of vessels that extends throughout the body, following the path of the veins. The lymphatic capillaries contain a clear fluid, lymph, which carries lymphocytes (immune cells). The lymphatic system is an important part of the immune system. In fact, organs of the immune system are known as 'lymphoid organs.' They include the following:

Bone marrow – where lymphocytes originate.

Spleen – a filter for the lymphatic system and a storage site for lymphocytes.

Liver – a major detoxification organ.

Lymph nodes – small bean-shaped structures that connect with lymphatic capillaries (They are concentrated in the groin, armpits, neck and abdomen; they filter lymph and produce lymphocytes.)

Thymus gland – home of the T cells, which mobilize the body's defense system when it is immune-challenged.

All these lymphoid organs are concerned with the growth, development and deployment of white blood cells (lymphocytes), whose function it is to defend the body against antigens (substances the body perceives as foreign and threatening, such as viruses, fungi, bacteria, parasites and pollen).

Kidneys

The kidneys are two bean-shaped organs located just under the diaphragm in the back. The liver sends water-soluble wastes to the kidneys via the blood where this waste is eliminated through the bladder.

Although small enough to fit in the palm of a hand and weighing no more than an orange, the kidneys are considered the 'great purifiers' of the body. Each kidney contains a million individual filter units (globules), and, according to Dr. Henry Bieler, "can filter 1700 quarts of viscous fluid (in which 50 different chemicals are dissolved) in 24 hours."¹ The kidneys determine which of these 50 chemicals are needed by the body, absorb them and filter out the rest. Of the blood filtered by the kidneys, 0.1% becomes urine.² The kidneys have the additional function of maintaining water balance.

Lungs

The lungs, another secondary elimination organ, expel toxins from the body. One of the most common toxins is carbon dioxide. The action of deep breathing helps to move lymph and blood through the body, and with it, toxins. The lungs are lined with mucus and cilia (hair-like projections) to help protect against and remove inhaled toxins.

Skin

The skin is the body's largest organ. It serves as a protective barrier to prevent toxins from entering the body. Because of its size, the skin "can eliminate more cellular waste than the colon and kidneys combined."³ It eliminates wastes through its sweat glands and mucous secretions and is considered a secondary elimination organ. The skin protects our inner parts and gauges temperature needs. New skin is made every 24 hours. This skin will be as clean as the blood that flows below it, for the condition of the skin reflects the condi-

tion of all that lies beneath it.

There are three layers of skin: the outer, inner and middle layers. The outer skin is the visible layer or 'hide.' The inner skin is called the mucous membrane. The middle skin (or serous membrane) lines the walls of the lungs, heart, abdomen and pelvic cavities, as well as those of the head and joints.

Chapter Summary

Digestion of carbohydrates starts in the mouth through the secretion of the enzymes ptyalin and amylase from the salivary glands. Food travels then through the esophagus into the stomach. The stomach's churning and secretion of digestive juices converts the food to chyme. Pepsin and HCl from the stomach break down protein. Chyme then enters the duodenum, where bicarbonates and digestive enzymes from the pancreas neutralize stomach acid and break down food into its component parts. Bile is secreted from the gallbladder into the duodenum to emulsify fat and decompose it for distribution. Food residue passes next into the small intestine, where 90% of absorption takes place. It then enters the large intestine through the ileocecal valve, traveling up the ascending colon, across the transverse, down the descending colon, through the rectum and out the anus. Liquid and nutrients pass through the wall of the large intestine into the bloodstream, then on to the liver for processing and filtration.

The colon houses three types of bacteria: good, neutral and bad. A balance of approximately 80% good/neutral to 20% bad is desirable for health maintenance. This balance will assist the body in normal elimination of solid waste, a minimum of one daily bowel movement (preferably two to three).

Impaired Digestion

Impaired digestion is the beginning of a process that ends with chronic disease (see figure 1). Throughout, there are many factors that can and do influence the process. Some of the factors are stress, drugs, alcohol, cigarettes, genetics, diet and environmental toxins. The only one not controlled easily in this process is genetics. A closer look at the digestive system reveals the effects of these influences.

Today there are more than sixty million Americans who suffer from digestive disorders, making gastrointestinal complaints the third leading cause of illness in this country. In this chapter, we will examine the causes and clinical implications of impaired digestion. Ultimately, poor digestion will encourage the advancement of age-related illness and autoimmune diseases such as arthritis, fibromyalgia, chronic fatigue, irritable bowel syndrome and more.

Food must be in the proper form for the body to absorb it. For example, carbohydrates must be converted into a form of glucose, and protein into amino acids. If food is not converted properly, it will pass through the system in an undigested form and produce toxins. If these toxins are not promptly eliminated, they can lead to chronic disease. As figure 1 shows, impaired digestion is the beginning of a series of problems that lead ultimately to chronic disease. Many of these problems are part of our daily life:

- Stress
- Processed food consumption
- Inadequate chewing/excess fluid intake with meals
- Improper food combining
- Overeating

When these factors affect our ability to properly digest and process foods, the results can include:

- Lowered production of hydrochloric acid (HCl)
- Pancreatic impairment (reduced enzyme production)
- Imbalanced intestinal pH
- Food sensitivities

The following section explores these factors in more detail.

Causes of Poor Digestion

The Role of Stress

There are several reasons why the body fails to digest food properly. A primary cause of poor digestion is stress. All unconscious activity in the body is controlled by the autonomic nervous system. The autonomic nervous system controls the digestive system and our reactions to stress. The body is designed to divert energy, blood, enzymes and oxygen away from the digestive organs when stress is experienced. If, for example, we have just eaten breakfast and are late for work, the body will support our mad dash through traffic before it will help digest a meal.

Any type of stress can have an adverse effect on the digestive process, virtually stopping it by lowering pancreatic enzyme production and inhibiting HCl production. Stress can be of a physical, mental or emotional nature.

Physical stress is tangible. Infections (even low-grade, sub-clinical ones), as well as trauma from injuries and surgery, are obvious types of physical stress. Dietary indiscretions (such as high sugar intake) constitute another type of physical stress that can have an adverse effect on the digestive system. Less obvious are more minor physical stressors like noise pollution and minor injuries such as cuts and bruises.

Emotional and mental stress – including financial worries, unhappy home life, unfulfilled career aspirations and arguments – all are a strain on the physical body and adversely alter its physiology.

Declining Digestive Health

Impaired Digestion

Intestinal Toxemia

Candida & Parasites

Imbalance of Gut Flora

Leaky Gut

Chronic Disease

Emotional stress causes the body to use its nutritional reserves. Once these nutritional reserves are depleted, digestion becomes impaired, owing to a lack of enzymes needed for the digestive process to function adequately. It's easy to see how any type of emotional or mental stress can become a digestive stress. It is extremely important to cultivate a relaxed state of mind when eating. This ensures unimpaired blood circulation needed for the organs of digestion to work properly.

In today's world, we're literally surrounded by environmental stress in the form of pollution, chemical additives and drugs. Pollutants are primarily man-made chemicals that don't belong in the body but have found their way there through contaminated air and water supplies. A growing number of these will pollute the environment and our bodies, adding more stress to already overburdened systems.

Chemicals also find their way into the body in the form of additives (approximately 5,000 of them) used to preserve, color, flavor, emulsify and otherwise treat our food. The ingestion of drugs, both prescription and non-prescription, adds more chemical stress. Even a simple visit to the dentist is likely to increase the toxic load on the body. The mercury and other metals in a

'silver' filling can result in oral toxicity, which ultimately causes systemic toxicity. Excessive toxins (chemicals, pollution and drugs) in the body must be processed and removed. This detoxification process uses large amounts of energy, which leaves little energy for proper digestive function. Improper digestion, as noted, can ultimately lead to degenerative and chronic disease.

Processed Food Consumption

Processed foods are those that have been through a commercial refining process, which includes the application of high temperatures. Such processing serves the purpose of increasing shelf life. The down side is that it also destroys some nutrients, creating a situation of imbalance and deficiency.

Refined carbohydrates include all products made with white sugar and flour. During the refining process, these foods are stripped of dozens of essential nutrients, including trace minerals needed for carbohydrate combustion. A steady diet of refined carbohydrates forces the body to rob itself of the chromium, manganese, cobalt, copper, zinc and magnesium needed to digest the carbohydrates. Once these minerals are depleted, the body is unable to digest carbohydrates properly (processed or natural). Consequently, these partially digested foods will ferment into simple sugars and alcohols, providing fuel for yeast and bacteria and leading to indigestion, gas and bloating, which increases the body's toxic load.

Regular intake of refined carbohydrates therefore increases both toxicity and deficiency, creating not only digestive disturbance but ultimately also serious health problems. Refined carbs feed the bad bacteria, irritate digestive organs and reduce the speed and efficiency of digestion.

Fiber is a non-nutritive food component that provides bulk to move food residue through the intestines. It is found naturally in whole grains, fruits and vegetables. When whole grains are

milled, the bran and germ portions are discarded, and with them the fiber and many nutrients. Americans typically consume too little fiber and too many refined carbohydrates, and tend to eat inadequate amounts of fruits and vegetables. Lack of fiber results in a slow transit time of food through the digestive tract. According to Michael Murray, ND, the average daily fiber consumption in the U.S. is approximately 20 grams per person¹ (30-40 grams of fiber is needed daily). The result of such a low fiber intake is a transit time of more than 48 hours (more than twice what it should be). Such a slow transit time can result in the absorption of toxins from putrefied fecal material that has not been eliminated. The absorption of toxins from within the body's digestive system is a form of self-poisoning or 'auto-intoxication,' which can lead to degenerative disease.

The refining process has resulted in fragmentation, not only of grain products but also oil products. Virtually every oil product on supermarket shelves is refined, bleached and deodorized (and not so labeled). During refinement, processed oil products are often exposed to heat, light and oxygen, and are usually extracted with solvents such as hexane (a toxin) to obtain higher yields. Thus much of the quality of the oils is lost in the refinement process.

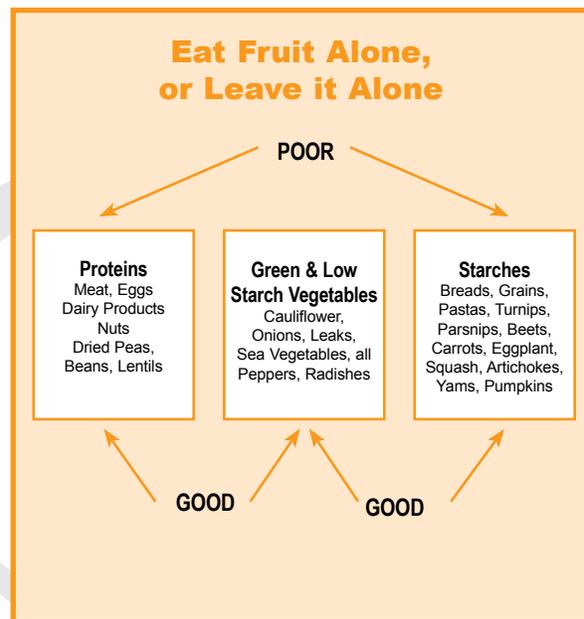
Many oils are hydrogenated, which increases shelf life at a high cost to consumer health. This process involves the use of extremely high temperatures and super-saturation of the oil with hydrogen, using a nickel catalyst. Hydrogenation of oil results in the formation of unnatural 'trans' fatty acids (TFAs), which constitute 50-60% of the fat content in commonly used 'partially hydrogenated vegetable oils.' Medical research has proven that human consumption of trans fats increases total cholesterol, LDL ('bad' cholesterol), and lipoprotein a, while

In addition to chewing food thoroughly, care should be taken to restrict fluid intake with meals, as over-consumption of liquids may dilute digestive enzymes and HCl, thus impairing digestion.

decreasing HDL ('good' cholesterol), all of which increase the risk of heart disease. Approximately 70% of all the vegetable oils used in food such as crackers, cookies, pastries, cakes, snack chips, imitation cheese, candies and fried foods contain several grams of trans fats.

Inadequate Chewing/Drinking with Meals

As previously noted, carbohydrate digestion begins in the mouth with the secretion of the enzyme ptyalin. This enzyme, mixed with saliva, is crucial to proper digestion of carbohydrates. Food chewed into small particles is then completely mixed with a saliva/enzyme mixture to begin digestion. When food is swallowed after only a few short chews, as so many of us busy people do, there is insufficient time for ptyalin to do its job. Consequently, carbohydrate diges-



tion is impaired. Large, inadequately chewed food particles are harder for the body to digest and can result in gas, bloating and indigestion.

Improper Food-Combining

Of the many food-combining rules that have been proposed, two emerge as most important in terms of their impact on the greatest number of people. These two rules are: (1) Eat fruits alone or leave them alone (Fruit is most beneficial

when eaten 20 to 30 minutes before other food.) and (2) Do not combine proteins and starchy carbohydrates at the same meal. Disregarding these rules can slow down digestion, resulting in much gas and bloating. Here's why: Fruit is digested very rapidly when eaten alone because it is not digested in the stomach but rather is pre-digested, being high in enzymes. Fruit (especially melons) passes through the stomach in a very short period of time, 20 to 30 minutes, releasing nutrients in the intestine. If eaten with (or after) other foods, then fruit will not be able to move through the digestive tract as rapidly as usual since other foods, especially proteins, have a much longer transit time. (Meat, for example, has a transit time of as much as 6 hours.) Fruit will ferment if eaten last since other foods will block its passage through the digestive tract. The result could be gastric distress.

Combining proteins (like meat) with heavy starches (like pasta or potatoes) may not pose a problem for a person with a strong digestive system; however, this combination places a heavy demand on the output of both proteolytic (protein-digesting) enzymes and amylase (starch-digesting), stressing the digestive system. Those with weak digestive systems may want to avoid these combinations. While separating proteins and starchy carbohydrates is desirable for those who have a slow metabolism (slow transit time), those who are hyper-metabolic (have a fast transit time) – about 20% of the population – will actually benefit from this combination because it will help to slow their metabolic rate.

These food-combining rules are most important to immune-compromised people with delicate digestive systems. Others, with good health, a hardy constitution and strong digestive organs may be able to disregard these rules without experiencing ill effects. It may be wiser therefore to view them as 'guidelines' rather than 'rules.'

Over-Eating

Overindulging in even the most nutritious foods will reduce their benefits, for the body will

be unable to use the nutrients. Today, there is a virtual epidemic of obesity due in large part, undoubtedly, to the nutrient deficiency of the Standard American Diet (SAD). Nutrient imbalances and deficiencies may cause people to select foods unwisely. Overeating may be largely the mind's unconscious effort to satisfy the body's hunger for the missing nutrients (lost during processing and preparation).

The habit of frequent snacking results in an energy drain on the digestive organs, which can decrease their effectiveness and even have the net effect of shortening lifespan. This is substantiated by two rat studies done independently in the U.S. and Germany in the early 1970s. "Both groups found the rats fed but once a day had a lower body weight and higher enzyme activities in the pancreas and fat cells. It was also found that the life-span of the controlled eaters was longer by 17%."²

CLINICAL IMPLICATIONS OF IMPAIRED DIGESTION

Low Production of Hydrochloric Acid. Hydrochloric Acid (HCl) is a digestive acid produced in the stomach by millions of parietal

Some studies have found that 50% of the people older than 60 have low stomach acid.

cells that line the stomach. HCl is so strong that it will burn your skin. The lining of the stomach is protected from this acid, however, by a layer of mucus. Adequate production of HCl is critical to good health and a properly functioning digestive system because it:

- Helps break down protein
- Sterilizes food by destroying bacteria and microbes that are present
- Is required for production of intrinsic factor (needed for B12 absorption)
- Is needed for mineral absorption
- Signals the pancreas to secrete enzymes in the small intestine

HCl is critical in the digestion of protein. It

breaks apart the chains of amino acids (protein constituents, which look like strings of pearls). Its presence also signals the production of pepsin, a protein-splitting enzyme, which further ensures that the amino acids are split into shorter chains to complete the process.

It is a common misconception that the body produces too much stomach acid (hyperacidity) Indigestion, heartburn and ulcers are often thought to be caused by an over-production of stomach acid. In fact, the largest selling drug in the world (Prilosec®) is designed to reduce the production of HCl. The problem with lowering the production of stomach acid is that indigestion, heartburn and ulcers may not be caused by an over-production of stomach acid but rather an under-production. Many studies have found that HCl production decreases by 50% as we age. Heartburn, indigestion and ulcers are often found in people with low stomach acid. For example, decreasing the production of stomach acid can cause many digestive problems like indigestion, heartburn and ulcers. It is now known that ulcers are most often caused by *H. pylori*, a bacterium. Low levels of HCl can result in overgrowth of this bacterium, as well as a proliferation of parasites and fungi. HCl is a natural antibiotic. It is the first line of defense against any microbe that enters the body. Lowering the production of stomach acid with drugs can increase the opportunity of parasites to enter the body.

We constantly eat food that contains these microbes. There is no way to know if food prepared and served at restaurants is properly washed or if the water is clean. So, when the HCl level is low, there is a greater possibility of parasitic infestation. Another problem that can occur when HCl levels are low is vitamin B12 deficiency. HCl aids in the production of intrinsic factor in the stomach. Intrinsic factor binds with extrinsic (from food) B12 to enable the absorption of B12 in the intestines. The lowering of stomach acid with age can inhibit the production of intrinsic factor and

thus the absorption of B12. Many senior citizens have B12 deficiencies, which can result in muscle weakness and fatigue.

Other problems with low HCl include poor mineral absorption and reduced enzyme production. The presence of HCl in the duodenum signals the pancreas to release water, bicarbonate and enzymes. When the pH of the stomach is elevated or alkaline (due to HCl deficiency), the pH of the rest of the body can become imbalanced. The body cannot maintain homeostasis under these conditions, and serious degenerative diseases, including cancer, congestive heart failure, osteoporosis and Alzheimer's disease, can result.³ The symptoms of HCl deficiency are basically the same as those of excessive HCl production. These symptoms include:

- Bad breath
- A loss of taste for meat
- Stomach pain
- Fullness, distension in the abdomen
- Nausea/vomiting
- Gas
- Diarrhea and constipation
- Severe heartburn
- Intestinal parasites or abnormal flora
- Iron deficiency
- Itching around the anus
- Undigested food in the stool
- Acne
- Candida infections
- Food allergies
- Weak, peeling and cracked fingernails⁴

Antacids...The Solution or the Problem?

When these symptoms are treated with antacids, there may be initial relief, but more problems eventually result. Antacids inhibit the body's natural ability to produce HCl. As noted, HCl has many benefits, including sterilization of our food. Without enough HCl, uncontrolled growth of every kind of microorganism in the stomach such as yeast, fungi and bacteria can result. Antacids alkalize the lower stomach, triggering the release of

more acid, requiring more antacids. A vicious cycle occurs, with the stomach alternating from too much acid production to not enough. This will eventually exhaust the cells of the stomach, and they will become unable to produce stomach acid.

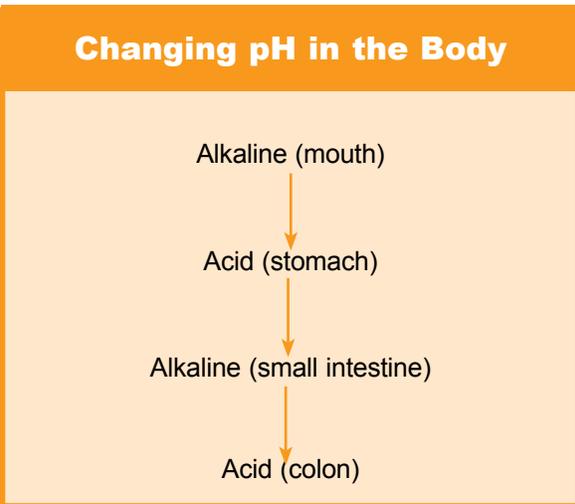
Many antacids contain aluminum compounds, which can bind the bowels, accumulate in

The Role of Digestive Enzymes				
The Enzyme				
Protease	Converts	Proteins	into	Amino Acids
Lipase	Converts	Fat	into	Fatty Acids
Amylase	Converts	Carbohydrates	into	Sugars

the brain and could be a factor in the eventual development of Alzheimer's disease. Aluminum-containing antacids can also cause long-term depletion of the calcium stored in the body, contributing to osteoporosis. Taking a medication for heartburn that could cause ulcers, create an overgrowth of yeast and bacteria, contribute to Alzheimer's disease and damage the bones in the body is not a good solution. A more natural approach to the problem of low HCl would be to take HCl supplements. More on that later.

Pancreatic Insufficiency

Besides secreting water and bicarbonates into the duodenum to neutralize the acidity of chyme,



the pancreas also secretes enzymes, which break down carbohydrates, protein and fats. Enzymes that convert proteins (into amino acids) are the proteases. Part of the job of protease enzymes is to prevent allergic reactions resulting from the absorption of non-digested protein, which causes an immune response in the lymphatic tissue of the intestinal tract. Fifty percent of the body's lymphatic tissue lines the intestinal tract to protect us from microbial invaders and toxins.

Poor production of pancreatic juice is termed pancreatic insufficiency. The condition can result from aging, physical and mental stress, nutritional deficiencies, a diet of only cooked foods, exposure to toxins or radiation, genetic weakness, drugs and infection. Low HCl production will also inhibit pancreatic secretions.

Pancreatic insufficiency is an underlying cause of high blood sugar (hyperglycemia). It is commonly found in people with candidiasis (an overgrowth of the yeast germ *Candida albicans*) and those with parasite infections. Symptoms of pancreatic insufficiency include gas, indigestion, abdominal discomfort, bloating, food sensitivities and the presence of undigested fat (and other food) in the stool.⁶

Lowered Enzyme Production

Enzymes are complex proteins that cause chemical changes in other substances. They are the basis of all metabolic activity in the body, facilitating more than 150,000 biochemical reactions and empowering every cell in the body to function. There are three types of enzymes in the body: metabolic, digestive and food enzymes. Metabolic enzymes run and heal the body, giving structure to macronutrients (fats, carbohydrates, protein) and repairing damage. The body cannot function or heal without metabolic enzymes.

Digestive enzymes are manufactured by the pancreas. There are about 22 pancreatic enzymes, chief of which are protease (digests pro-

tein), lipase (for fat digestion) and amylase (for carbohydrate digestion). Food enzymes also digest food; however, they are supplied to the body solely through the diet, only from raw foods. These raw foods supply enzymes to digest the food in which they're found, with no extras to digest other foods. Cooking at temperatures more than 116 degrees destroys food enzymes. Enzyme deficiencies are widespread in the American culture because virtually all food in the standard diet is refined (heat has been applied during processing).

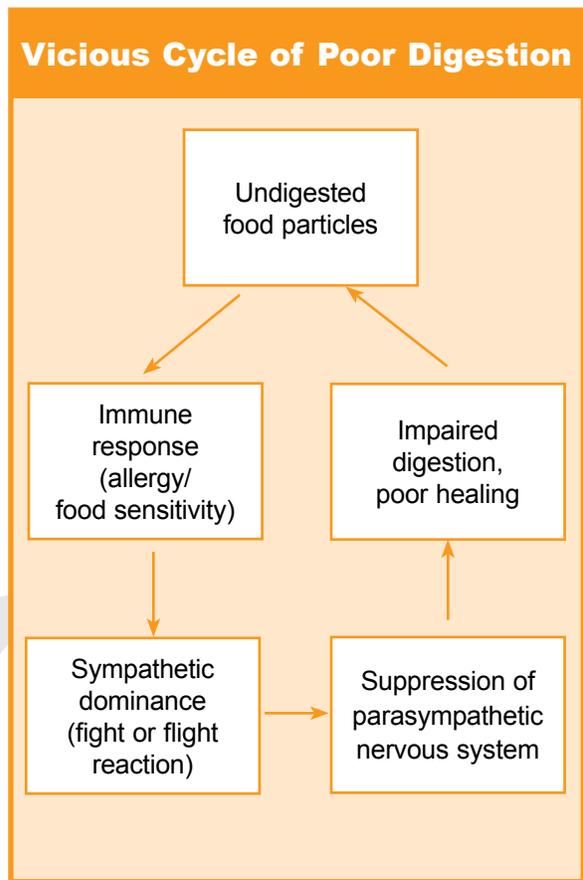
Imbalanced Intestinal pH

pH is a measurement of acidity/alkalinity. It is measured on a scale from 0 to 14, with substances becoming increasingly more alkaline as the number increases, as per the following table:

0	_____	7	_____	14
	acid		neutral	alkaline

The optimal pH for digestion varies throughout the digestive tract as food moves through it. In the healthy digestive tract, the saliva secretes alkaline juices into the mouth; the stomach produces acid secretions; the pancreas and gallbladder discharge alkaline juices to buffer the stomach acid; therefore, the small intestine is alkaline, and the colon is normally acid due to the presence of large populations of bacteria. So, there is a pH shift: alkaline (mouth) to acid (stomach) to alkaline (small intestine) to acid (colon).

An imbalance of intestinal pH can result from impairment of digestive secretions such as HCl and from pancreatic insufficiency. Lowered HCl production can result in an alkaline (rather than an acid) stomach. Pancreatic insufficiency could create an acidic (rather than an alkaline) environment in the small intestine if the pancreas fails to produce bicarbonate to alkalize the chyme leaving the stomach and entering the duodenum. Antacids can further complicate matters if taken habitually in an attempt to decrease heartburn. If the pH of any of these key digestive organs is incorrect, the result will be incomplete digestion and its adverse health consequences.



Food Sensitivities

The improper digestion of food (especially proteins) can lead to an allergy-like response. When undigested food particles enter the lymphatic system through the walls of the intestine, the body responds as if they were foreign invaders, known as antigens. An immune attack begins with the body producing antibodies (chemical bullets), which bind to the antigens, forming what are known as immune complexes. When this occurs, there may be enough of an immune system imbalance to create indigestion. In addition, stress can create a sympathetic dominance (fight or flight syndrome), which impairs digestion. Both of these responses can increase intestinal permeability and lead to more food sensitivities.

As the breakdown of the digestive and elimination processes occurs, an adverse reaction to any food can result. Certain foods show up more often than others as 'allergens.' These include

milk, soy, wheat, corn, yeast, sugar, eggs and the 'nightshade' family, which consists of white potatoes, eggplant, tomatoes, chili peppers and garden peppers. Tobacco and certain drugs are also included in the nightshade category. Among the drugs so categorized are those containing atropine, belladonna and scopolamine, found in most sleeping pills.⁷ It is important to know that a sensitivity or allergy to any food can develop, regardless of nutritional value or lack of it. It is also important to distinguish between an allergy and sensitivity.

Food allergies are easy to recognize. They involve immediate, strong reactions to foods, whereas a sensitivity expresses itself in a much more subtle way. Food sensitivities are delayed reactions to foods, which can occur anywhere from a few hours to a few days after exposure. With the allergic response, the areas of the body affected by exposure to the allergen are generally limited to the air passages, skin and digestive tract. When someone eats strawberries and develops hives, or is exposed to pollen and starts sneezing, this is a classic allergic response, the type for which allergists test with skin prick tests. This type of reaction is an IGE antibody mediated reaction to antigens in the food. This is an acute allergy.

The IGG (as distinct from IGE) antibody reaction to food is generally known as a food sensitivity rather than a food allergy. The delayed food sensitivity, in contrast to the acute allergy, may affect any organ or tissue of the body, resulting in a wide array of physical and emotional symptoms. Such reactions, because they are delayed (by as much as three days), are frequently not recognized as food sensitivities. It is common for reactive foods to be consumed frequently, to the point of addiction, for by consuming such foods habitually, the body (unconsciously) avoids withdrawal symptoms. Unfortunately, this also perpetuates digestive disorders. When sensitive foods are eaten daily, the small intestine responds to the offenders by producing an antibody/antigen response. With the passing of time, this response irritates the digestive lining by producing

inflammation. The response is analogous to wearing wool every day against the outer skin. The skin would eventually react by becoming inflamed. The same holds true for the intestinal lining of the gut. If people avoid the foods to which they're sensitive, they may start to feel somewhat better, but if digestion isn't improved, they will develop new sensitivities. On the other hand, if digestion is improved and toxins eliminated, sensitivities and allergies will be decreased or eliminated.

Both sensitivities and allergies can develop in response to anything in the environment – not just food. The response to the antigen – be it corn or petrochemicals – can affect any organ of the body. The gut will always be involved, however. Poor digestion is both the cause and the ultimate result of the allergic response or sensitivity, as figure 7 indicates. Significant stress will definitely lead to sympathetic dominance (see figure 8). This decreases digestive efficiency (less enzymes, etc.) and increases intestinal permeability, setting the stage for food allergies or sensitivities. The more food allergies or sensitivities, the more reactive the immune system becomes, creating more and more circulating antigen/antibody complexes. These will promote inflammation throughout the body, especially in the GI tract, creating further problems.

With food allergies and sensitivities, there is an element of increased permeability (leaky gut) of the intestinal tract that plays a dominant role in initiating the process. Undigested food particles have the effect of initiating an immune response, (allergic reaction) when they have made their way into the bloodstream. This can occur only when the lining of the intestine becomes porous. This condition of increased permeability or porosity of the lining of the intestine is known as 'leaky gut syndrome.'

Notes

¹ Michael Murray, ND, *The Healing Power of Foods*, Prima Publishing, 1993, p. 83.

² Dr. Edward Howell, *Enzyme Nutrition*, Avery

Publishing Group, Inc., 1985, p. 112.

³ Judy Kitchen, "Hypochlorhydria: A Review – Part I," Townsend Letter for Doctors and Patients, October 2001, p. 56.

⁴ Ibid., p. 58.

⁵ Ibid.

⁶ Elizabeth Lipski, MS, CCN, Digestive Wellness, Keats Publishing, Inc., 1996, p. 207.

⁷ James Braly, MD, Dr. Braly's Food Allergy and Nutrition Revolution, Keats Publishing, Inc., p. 437.

Chapter Summary

Stress, broadly defined as anything that causes an extra load on the body, can be viewed as the cause of digestive dysfunction. Digestive stress comes in many forms, which may include:

- Emotional or physical stress
- Poor diet
- Medications
- Environmental toxins
- Over-consumption of processed food

If stress from any of these sources continues for an extended period of time, the result is a burdened digestive system and stressed supporting organs (such as liver and pancreas). The end result is altered function or structure of the body's organ systems which develops into:

- Deficiency of HCl, needed to break down proteins and protect from harmful microorganisms
- Pancreatic insufficiency (reduced enzyme and bicarbonate secretion), a precursor to more serious disease
- Imbalanced intestinal pH, which prevents proper digestion of foods due to excessive acidity or alkalinity of digestive juices
- Food sensitivities and allergies, which can be both the cause and the result of poor digestion

All of these stressors impair the digestive process, which leads to intestinal toxemia (the subject of the next chapter), Candida and parasites, an imbalance of gut flora, leaky gut and chronic disease, subjects of the next several chapters.

I- ACT COLON

The Effects of Digestive Dysfunction

Intestinal Toxemia

Intestinal toxemia, poisoning of the intestines, occurs when the bacteria present in the gut act upon undigested food. This interaction can produce toxic chemicals and gases. These toxins, in turn, can damage the mucosal lining, resulting in increased intestinal permeability (leaky gut). The net result is that the toxins are then able to spread throughout the body via the bloodstream. In the words of Dr. John Matsen, ND, "If you don't digest your food quickly, some microorganisms will digest it for you, making toxins."¹ The waste products from these microorganisms produce some extremely potent toxins, 78 known types, including skatoles, indols, phenols, alcohol, ammonia, acetaldehyde and formaldehyde.² All of these are examples of endotoxins, internally produced toxins. They are just as damaging to the body as external environmental toxins, exotoxins.

Intestinal toxins can also produce free radicals, molecules with unpaired electrons, which cause damage to cells when they rip electrons out of cell membranes. Free radicals live only momentarily, but can do a great amount of damage in that short period of time. Large numbers of free radicals are produced by dozens of intestinal toxins. When the body is unable to buffer them due to toxic overload, disease results. To inactivate free radicals, the body deploys antioxidants, nutrients that act as free radical scavengers. Vitamins A, C and E and the minerals selenium and zinc are well known antioxidants. What is not so well known is that bile has even stronger free radical scavenging effects. This makes proper liver and gallbladder function important in preventing free radical damage.

In the beginning stages of intestinal toxemia, the body generally has sufficient nutritional reserves

to manage the stress. At this point, it is not acutely distressed and may be without symptoms. However, as time passes, and the opportunistic organisms (bacteria, viruses, fungi, etc.) multiply, their toxic waste products overwhelm the body's defenses, transferring power from the 'good' to the 'bad guys.' As this happens, organisms that normally inhabit the GI tract in smaller numbers, without causing harm, such as parasites and Candida, can proliferate and produce symptoms such as gas, bloating, constipation, diarrhea, skin disorders, brain fog, chronic fatigue, irritable bowel syndrome and joint and muscle pain. These symptoms may or may not be recognized as the result of digestive stress, for they can occur anywhere in the body.

Candida and Parasites – Secondary Toxic Suppressors

Candida albicans, a yeast germ that becomes a problem when it proliferates and mutates to a fungal form, is actually a form of parasite, as are the other 'critters' that normally inhabit the GI tract – microorganisms like viruses, bacteria, worms, amoebas and protozoa. These are all considered 'secondary' toxic suppressors because of their opportunistic nature. They proliferate when the opportunity arises as a result of a shift in the body's terrain or internal environment (changes in pH, microbial population, muscular tone, etc.). Such a shift results in energetic and chemical imbalance, and may be caused by impaired digestion. The shift in terrain can also result from environmental pollution and drugs. Drugs and environmental toxins (non-steroidal anti-inflammatory drugs [NSAIDs], chemicals, solvents, metals, etc.), coupled with structural misalignments and emotional stress, may be viewed as primary toxic suppressors, in that they create an environment for the secondary toxic suppressors – the opportunistic microorganisms, which include Candida and parasites – to proliferate.

Candida and Other Fungi

Candida albicans is one of over 80 species of Candida and more than 250 species of yeast, many of

which are parasitic in the human body. Candida is normally present in the intestinal tract in small amounts. When it remains in yeast form and exists in balance with the trillions of bacteria that normally



inhabit the digestive tract, all is well with the body's internal eco systems. The ideal ratio of Candida to bacteria is 1:1 million; that is, 1 yeast to 1 million bacteria. This critical balance will be maintained if:

- The immune system is functioning normally.
- An optimal ratio of 'good'/neutral to 'bad' bacteria (80:20) is maintained.
- The pH of the colon is balanced (on the slightly acid side).

The medical community's awareness of Candida has been largely limited to the local effects of acute infection (candidiasis). Such infection involves invasion of the mucous membranes, typically on the skin, in the mouth ('thrush') and in the vagina ('yeast' infection). A chronic overgrowth of Candida in the intestines leads to an actual change in the form and function of the organism: It mutates from its yeast-like state to a fungal form. As such, Candida can lead to a variety of conditions that can affect the body physically and mentally – a fact not well recognized or accepted in traditional medical circles.

While many physicians still treat a vaginal yeast infection as a localized problem, a growing number are becoming aware that such infection is invariably accompanied by an overgrowth of Candida in the gut. To successfully resolve vaginal yeast problems and prevent their return, it is necessary to restore healthy conditions in the intestinal tract.

In its fungal state, Candida grows very long roots, rhizoids, which actually puncture the mucous lining of the intestine. It also secretes acid, which can change the intestinal pH and can cause wear to this protective mucous lining. The resulting increased intestinal permeability is known as leaky gut syndrome. This condition permits the entrance of the fungus (and its toxic waste products) into the bloodstream along with other foreign substances and undigested food particles. This leads to a series of problems discussed in the 'Leaky Gut' section of this chapter.

Among the fungal toxins that can enter the bloodstream through the bowel wall is acetaldehyde, the major waste product produced by Candida. Acetaldehyde is a poison that is converted by the liver into alcohol. As alcohol increases

Conditions That May Arise From Fungal Toxins

- Chronic fatigue
- Depression and anxiety
- Infertility
- Miscarriage
- Skin problems
- Arthritis
- Intestinal disorders
- Digestive problems
- Migraine headaches
- Sugar cravings
- Nutritional deficiencies due to malabsorption
- Hormone imbalances
- Jock itch
- Fingernail/toenail fungus
- Insomnia
- ADD
- Interstitial cystitis
- Respiratory disorders
- Fibromyalgia
- Heart conditions
- Multiple Sclerosis
- Female problems
- Allergies and environmental sensitivities
- Bladder infections
- Prostatitis
- Blurred vision
- Athlete's foot
- Ringworm
- Bad breath

(due to insufficient oxygen in body tissues), symptoms associated with drunkenness develop: disorientation, dizziness and mental confusion. The poisonous effects of alcohol can result in anxiety, depression, irritability, headaches and fatigue. Acetaldehyde is just one of the Candida toxins involved in enzyme destruction, which results in impaired detoxification ability, decreased cellular energy production and a release of cell-damaging free radicals. There are thought to be more than 100 such toxins produced by Candida.

Candida toxins, carried to the liver by the bloodstream, proceed from there to other organs of the body – the brain, nervous system, joints, skin, etc. If the liver's detoxification ability is impaired due to inadequate nutrition and toxic overload, these toxins will be stored and can initiate chronic illness, including those conditions listed in figure 2. Fungal toxins, known as mycotoxins, suppress immune function. Some of these toxins, like aflatoxin, have been linked to cancer and hardening of the arteries.

Of special interest to women is a mycotoxin called zearalenone, which mimics the effects of estrogen in the body. It is produced by a mold, fusarium graminearum, and is found primarily in corn products, bananas and in the meat of cattle fed contaminated corn. An overabundance of estrogen can result in such health problems as fibroids, breast lumps, infertility and cancer. The presence of zearalenone in the body can cause these problems as well.

There are currently no limits placed on the amount of this mycotoxin permitted in grains intended for human consumption.⁴

Although the food supply is monitored for the presence of common mycotoxins, it is not uncommon for molds to contaminate grains and more commonly to affect nuts. Fungus is, in fact, ubiquitous in the environment – that is, found virtually everywhere. It is in the air and food. It even exists

Drugs That Disrupt Intestinal Ecology

- Antibiotics
- Birth control pills
- Cortisone
- NSAIDs (non-steroidal anti-inflammatory drugs like ibuprofen)

on exposed surfaces and can quite literally ‘get under the skin.’ Its presence in the skin appears to be aggravated by use of alkaline soaps.⁵ Exposure to moldy environments can result in fungi and their toxins being introduced into the body. Fungal infections can also be transmitted sexually.

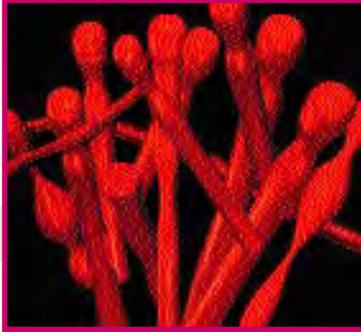
As previously mentioned, the presence of a small amount of yeast in the intestinal tract is normal, even helpful. However, it is abnormal for fungi to live inside the human body. Once inside, they live

Profile of a Killer Disease

Egypt, 1924: British egyptologist, Hugh Evelyn-White, was among the first to enter the tomb of King Tutankhamen, shortly after its discovery in 1922 near the ruins of Luxor. Evelyn-White became one of the dozen explorers to die soon after visiting the site. “ I have succumbed to a curse,” wrote he in his own blood in 1924, moments before hanging himself. At the time no one could explain his suicide nor the many other mysterious deaths of other unfortunate ones who had entered the tomb. Coming primarily to look for gold and treasures, the excavators paid no attention to the pink, gray and green patches of fungi on the chamber walls. So, in reality, King Tut's curse was a really severe allergic reaction to fungi: fruits and vegetables placed in the tomb to feed the pharaoh throughout eternity but which, decaying over centuries, had created deadly molds.

- from Candida by LucDe Schepper, MD, PhD, Lic. Ac., D.I. Hom, C. Hom.

by ingesting dead or decaying matter.⁶ Because fungal parasites must have sugar in order to survive, we often experience sugar cravings when harboring fungi. Giving in to those cravings only promotes more fungi.



Ironically, conditions that are caused by fungi are often medically treated with drugs (antibiotics, birth control pills, NSAIDs, cortisone) that destroy beneficial flora, thereby allowing fungi to proliferate, making the condition worse. These drugs alter the terrain of the bowel by causing the extermination of good bacteria as well as bad. Any hormonal therapy, such as estrogen replacement, can cause an overgrowth of Candida in this manner. The elevation of progesterone during pregnancy and in the second half of every menstrual cycle may also stimulate Candida growth.

Candida secretes carbon dioxide, which may lead to gas and bloating. It is significant that poor digestion, which began the chain of events that led to Candida overgrowth, can also be an effect of it. Many people are caught in this vicious cycle. It is very important that those with Candida overgrowth adhere to a special diet for a period of time. This diet is described in chapter 8. Those who experience some of the described symptoms should complete the adult or children's Candida self-analysis in the Appendix.

Special laboratory tests for Candida are available through aware physicians. These tests include Candida antibody panels, intestinal permeability studies and digestive stool analysis. The International Health Foundation is a source for the names of physicians who are familiar with testing for and treating chronic systemic Candida infection. The Foundation's services are available

at 901-660-7090 (<http://candida-yeast.com>). This non-profit organization, founded by pioneering Candida researcher/doctor, William G. Crook, MD, offers publications to direct people to health care professionals who are interested in yeast-related health problems.

Most nutritional practitioners know about Candida and the havoc it can create in the body. What isn't as well known is that Candida infections often accompany parasite infections. The drain on the immune system by the parasite creates the opportunity for the Candida to proliferate. The following section explains the effect parasite infection can have on human health.

Parasites

Parasites have become a dominant health problem that many believe has reached epidemic proportions. It's something of a silent epidemic, however, because the problem is likely to go undiagnosed or be misdiagnosed. Some parasite problems have been recognized, even made headlines – like the outbreak of *Cryptosporidium* (a micro-

Parasite News

Instead of experiencing better health, most of the people living in North America are deteriorating. People may be living longer, but they are not living healthier. There are many factors that contribute to this decline in health, but parasites may be one of the most overlooked.

The founding editor of *Prevention Magazine*, J.I. Rodale, once wrote an editorial stating that only those who protect themselves from the steadily increasing burden of toxic environmental pollution would survive in coming times.

scopic parasite) in the Milwaukee water supply in 1993, which made 400,000 people ill and killed 40. In that same year, parasite contamination was found in one out of every four municipal wa-

Parasite Survey Facts

- More than half the people with infection had traveled overseas in the past five years.
- People traveling to Mexico and Europe had the highest risk of infection.
- People living in households where someone was infected had twice the risk of infection.
- Of people infected, some had no symptoms.
- Some people unknowingly acted as carriers. (Since there are no symptoms, they could have been unaware, been untreated and passed parasites on to others.)
- People infected by more than one parasite had similar symptoms to those with single infections.
- Women were twice as likely to be infected as men and were more heavily infected.
- The most prevalent pathogens were *E. histolytica*, *Giardia lamblia* and *Blastocystis hominis*.⁸

Figure 4

ter supplies in 14 states. *Cryptosporidium* was featured on ABC News in the following year in reports that it had invaded New York City's water supply.

Another water-born parasite, *Giardia lamblia*, has been estimated by the Center for Disease Control to affect between 100,000 and 1 million people each year. In 1976, one of every six people in the U.S. was infected with one or more parasites.



In 1996, Dr. Omar Amin from Diagnostic Labs conducted a survey of 644 stool samples. In more than half (378), parasites were detected.⁷ In the group, a number of typical characteristics emerged as shown in figure 4.

Parasites are difficult to detect. They tend to hide in the lining of the intestines; and they live in other organs as well. If parasites are in the heart or lungs, they will not appear in the stool regardless of how well it's analyzed! Some of the reasons parasites are difficult to recognize and diagnose:

- Parasitic infestation has generally been considered a disease of the tropics, so a doctor isn't likely to consider it when making a diagnosis.
- Parasitology is seldom presented in mainstream medical journals or medical schools.
- Other than records of the Center for Disease Control, there is little tracking for parasites. With lack of information and little training, doctors aren't apt to look for parasites as an underlying cause of illness. If the symptoms aren't confined to the digestive tract, parasitic infestation could surely go undiagnosed.

Parasites have a complex life cycle. Three of the most prevalent parasites found in the United States and worldwide shed at irregular intervals. This means that a parasite might be in the stool two to four days a week but not the rest of the week. If the person is tested for a parasite on a day it is not present, there will be a negative test result. The person would then go untreated. Therefore, it would be best for repeat stool samples (at least two to three) to be taken on non-consecutive days.

Symptoms of Parasites

- Constipation/diarrhea
- Digestive complaints (gas, bloating, cramps)
- Irritability/nervousness
- Irritable bowel syndrome
- Persistent skin problems
- Granulomas (tumor-like masses that encase destroyed larva or parasite)
- Overall fatigue
- Disturbed sleep
- Anemia
- Muscle cramps
- Joint pain
- Post nasal drip
- Teeth grinding
- Prostatitis
- Sugar cravings & ravenous appetite
- Allergies

Figure 5

Another difficulty with parasite detection is there are many newly identified parasites that have not been sufficiently studied or recognized as pathogenic. An example would be Cyclospora, which was classified as a human parasite just a few years ago. The result of

Parasite Sources

- Contaminated raw fruits and vegetables
- Raw or rare meat
- Polluted water/tap water
- Pets
- Vectors (carriers, like mosquitoes)
- Through the skin
- Through the nose (inhaled)
- Restaurant dining (especially at salad and sushi bars)
- Camping
- Previous parasite infection/reinfection
- Working in infant care
- Travel
- Solvents, like prophyl alcohol (alter internal terrain, making it suitable for parasites)
- Contact with someone who has parasites (a carrier)

Figure 6

a parasite test done prior to the time that Cyclospora was recognized as pathogenic would have been reported as negative even though Cyclospora was present. By the 1990's, Dientamoeba fragilis was considered a pathogenic parasite though it had previously not been. The field of parasitology is thus evolving and continuously making discoveries of 'new bugs.'

How do parasites threaten human health? They can injure the tissue of the digestive tract or most other organs. Most people don't realize this, but it is not only the parasite that can cause damage to the body, but also the waste that the parasite discharges into the body. This is part of the life cycle of any living organism: Food is ingested; waste is expelled. Parasites can disrupt the digestive process of the host, interfering with enzyme production and the breakdown of food. A properly functioning digestive system is critical to

good health, so anything that disrupts this process will also affect the immune system. Remember: The mission of the parasite is to survive.

Degenerative disease can be associated with parasites. They create a mucous overlay in the gut that blocks absorption of nutrients so that the food we eat nourishes them, not us. Parasites can affect tissue anywhere in the body. Disorders that have been associated with parasites include arthritis, multiple sclerosis, appendicitis, both overweight and underweight conditions, cancer and epilepsy. Some cases of epilepsy have been associated with pork tapeworm. This is probably due to auto-antibody production by the immune system in response to the parasites and the toxins they liberate. Pork should not be cooked in a microwave oven, as microwaves do not kill the Trichinella worm in it. Parasites can get into the blood and travel to any organ, causing problems that are often not recognized as parasite-related. Consequently, disorders involving parasites are often wrongly diagnosed.

A roundworm infestation in the stomach can give the appearance of a peptic ulcer. Amoebic colitis can be mistaken for ulcerative colitis. Tapeworms can be the unsuspected cause of blood sugar disorders, both hypoglycemia and diabetes. Their eggs, when present in the liver, can be mistaken for cancer. Those parasites that fall into the protozoa category can cause arthritis-like pain, as well as leukemia-like symptoms. Chronic Giardia can be an undetected element or missing diagnosis in both candidiasis and chronic fatigue syndrome.

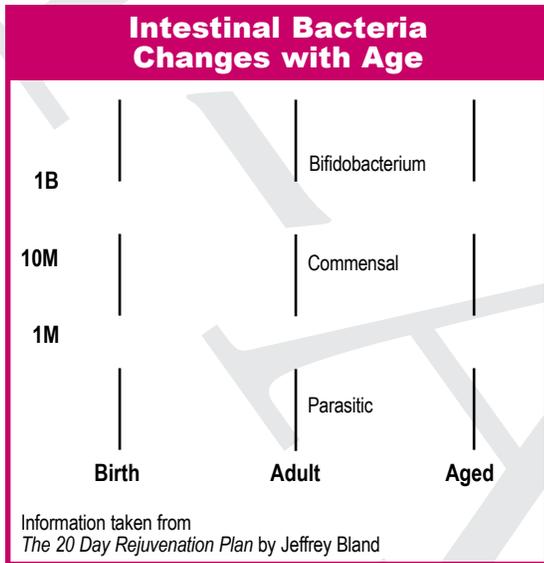
Causes of Intestinal Flora Imbalance

• Antibiotic use	• Steroid drug use
• Refined carbohydrates	• X-rays/radiation therapy
• Birth control pills	• Chlorinated water
• Poor digestion/elimination	• Mercury toxicity
• Stress	• Pollution
• Low fiber diet	

Figure 7

The appendix has been described as the ‘region of worms.’ Due to its location at the bottom of the cecum, food residues and waste tend to accumulate and stagnate there, producing conditions favorable for parasites to thrive and appendicitis to develop.

Medical texts don’t contain much information about parasites other than stating they can cause diarrhea and malabsorption. It is important to bear



in mind, however, that parasites can mimic other disorders and/or produce no noticeable symptoms. When they do cause symptoms, a wide range can be displayed, as indicated in figure 5.

Another factor that no doubt contributes to the growing parasite epidemic is the widespread use of drugs that suppress immunity as a side effect. Many of the drugs in common use today are immunosuppressive and therefore increase our susceptibility to parasitic infection.

Although many external factors contribute to the parasite problem (see figure 6), by far the biggest factor is an internal one – a dirty colon, largely the result of an unwholesome lifestyle and bacterial imbalance in the colon.

Imbalance of Gut Flora

The flow chart in figure 1 shows how impaired digestion leads to intestinal toxemia (production of toxins, as undigested food interacts with bacteria in the intestines). This toxemia, in turn,

Good bacteria aids in:

- Digestion of food
- Absorption of nutrients
- Production of B vitamins
- Production of antibodies
- Destruction of competing bacteria

can lead to an overgrowth of harmful bacteria and often to Candida and parasites. Once these pathogens are established, they proliferate, and the bacterial imbalance is perpetuated, even increased, causing a vicious cycle.

The micro flora composition of the intestinal tract is complex. There are approximately 500 different species of micro flora that are part of the normal intestinal environment. There is a simple way to understand the different bacteria groupings in the gut: In every individual there is a ratio of good (health-promoting) bacteria, neutral bacteria (commensal) and pathogenic (disease-causing) bacteria. All of these organisms are competing for food and space in the digestive tract.

It is important that the good bacteria be abundant in the digestive tract. Bacteria become ‘parasitic’ if they do not remain in symbiotic relationship (harmony) with the rest of the microbial population. For example, if Candida (which is a natural inhabitant of the gut) or some other microbe grows out of control, the body is in a state of dysbiosis. Dysbiosis (out of symphony or ‘disturbed biology’) is a term coined by Dr. Eli Metchnikoff early in the twentieth century to describe an imbalance of intestinal flora and the accompanying conditions. Metchnikoff discovered the health benefits of probiotics and won the Nobel Prize in 1908 for his work with lactobacilli. He theorized that toxic

compounds produced by bacterial breakdown of food were the cause of degenerative disease and a major factor in aging.

Beneficial flora are required for bacterial fermentation of dietary fiber, which results in short-chain fatty acid production. The short-chain fatty acids butyrate, acetate and lactate support the production of new cells, which is vital in rebuilding the intestinal tract. Where dysbiosis is present, the intestinal wall cannot be rebuilt, as it normally would be, every three to five days. An extra benefit of the short-chain fatty acids is the prevention of colon cancer.

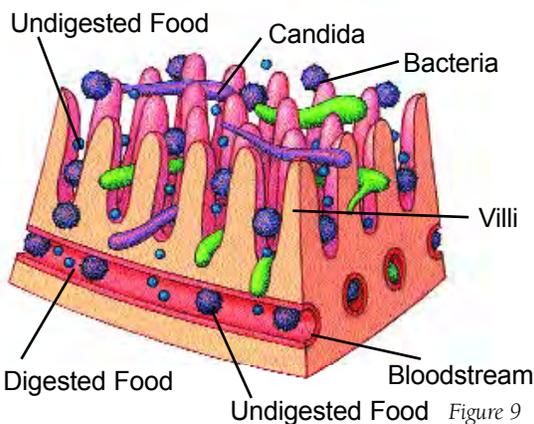
Many factors cause dysbiosis, including poor diet, slow transit time and emotional stress. Chemicals and certain drugs can cause the condition, as can surgery and improper ileocecal valve (ICV) functioning. The ICV is the valve between the small intestine and large intestine. It is usually kept closed to prevent reflux (back flow) of fecal contents into the small intestine. Problems arise when constipation is present. As the peristaltic colonic waves attempt to propel the stool toward the rectum, backward pressure will push some of the liquid stool in the colon back through the ICV, causing contamination and colonization of the small intestine with colonic bacteria. This is medically known as 'small bowel dysbiosis,' a major cause of leaky gut syndrome. In addition, like the entire intestinal tract, the ICV muscular tone is controlled by the autonomic nervous system. When this system is imbal-

Factors Leading to Leaky Gut

- Alcohol (gut irritant)
- Caffeine (gut irritant)
- Parasites (introduced into the body by contaminated food and water)
- Bacteria (introduced into the body by contaminated food and water)
- Chemicals (in processed foods)
- Enzyme deficiencies (e.g. celiac disease, lactase deficiency, causing lactose intolerance)
- Diet of refined carbohydrates ('junk' food)
- Prescriptive hormones (like birth control pills)
- Mold and fungal mycotoxins (in stored grains, fruit and refined carbohydrates)

anced, a decrease in smooth muscle tone of the ICV could result in backflow of the colonic contents into the small intestine, again promoting leaky gut syndrome. Manipulation of autonomic nervous system balance may be helpful in providing normal intestinal tract tone and function. Modalities such as acupuncture, chiropractic manipulation, yoga and tai chi can be very helpful in this regard. The mechanics of the ICV and the recto-sigmoid portion of the colon can become compromised when the body is in

Unhealthy Digestive Tract



Autoimmune Diseases Resulting from Leaky Gut

- | | |
|----------------------------|--------------------------|
| • Lupus | • Alopecia areata |
| • Rheumatoid arthritis | • Polymyalgia rheumatica |
| • Multiple sclerosis | • Sjogren's syndrome |
| • Chronic fatigue syndrome | • Thyroiditis |
| • Fibromyalgia | • Vitiligo |
| • Crohn's disease | • Ulcerative colitis |
| • Vasculitis | • Diabetes |
| • Urticaria (hives) | |
| • Raynaud's disease | |

the incorrect position for elimination of bowel contents. The correct posture would be a squatting position, which is the elimination posture used in much of the world.

Where dysbiosis is present, the ideal ratio of beneficial to putrefactive (pathogenic) bacteria (80:20) is upset, even reversed. When putrefactive bacteria proliferate in the intestinal tract, peristalsis becomes sluggish. This inhibition of muscular contractions in the cecum causes food residues to concentrate in the appendix where they stagnate and cause inflammation (appendicitis = inflammation of the appendix).

There are many aspects of today's lifestyles that contribute to the destruction of beneficial flora, leading to dysbiosis (see figure 7). Dysbiosis commonly occurs due to faulty digestion, which results in partially digested food reaching the end of the small intestine and entering the colon. The action of the colonic bacteria on partially digested food can result in the putrefaction of proteins and fermentation of carbohydrates, which may cause further growth of the pathogenic bacteria. This problem is greatly compounded when food stays in the intestinal tract too long (constipation).

Leaky Gut

Toxic irritation of the gut lining is step two in our flow chart in figure 1. Intestinal toxemia is the direct result of impaired digestion caused by numerous stressors. This toxemia occurs when the bacteria that line the walls of the intestinal mucosa act upon undigested food. The toxins produced from this interaction attack the delicate intestinal mucosa, and allow for the development of systemic candidiasis and parasitic infection. Repeated attacks by these internally produced toxins (endotoxins) will, as time passes, erode the gut lining. This is the basic mechanism by which leaky gut develops. It can also be caused or aggravated by a number of other factors, as indicated in figures 10 and 11.

According to Elizabeth Lipski, MS, CCN, "NSAIDs (non-steroidal anti-inflammatory drugs) can cause irritation and inflammation of the intestinal tract, leading to colitis and relapse of ulcerative colitis ... [They] can cause bleeding and ulceration of the large intestine and may contribute to complications of diverticular disease [outpouching of a segment of the intestine]." ¹¹ Prolonged use of NSAIDs blocks the body's natural ability to repair the intestinal lining and also interferes with the production of prostaglandins, regulatory messengers that circulate throughout the body.

The mucous lining of the small intestine is a semi-permeable membrane that allows nutrients to enter the bloodstream, while shielding it from unwanted toxins and undigested food. This mucous lining is like the screen on a window in a house that lets the air in but keeps the bugs out. It is also like the skin, in that it sloughs off a layer of cells naturally every three to five days and produces new cells to keep the lining semi-permeable. Once endotoxins have eroded this membrane, however, it becomes permeable. (The 'screen' on the 'window' becomes filled with holes!) Now the toxins and food particles, which would normally not be permitted to enter the system, literally leak into the bloodstream. The body then becomes confused and attacks these unwanted toxins, as if they were foreign substances, and develops antibodies (chemical bullets) against them.

Chronic Disease

The net result of the above process is development of autoimmune disease, where the body makes antibodies against its own tissues. There are some 80 recognized autoimmune diseases (see figure 12 for a partial list); the cause of all of them is 'unknown' in medical circles.

Physicians are becoming increasingly aware of the importance of the GI tract in the development of autoimmune disease and allergy. In fact, "researchers now estimate that more than two-thirds of all immune activity occurs in the gut." ¹² Allergies appear when the body develops antibodies to

the (undi-gested) proteins derived from previously harmless food. These antibodies can enter any tissue and trigger an inflammatory reaction when that food is eaten. According to Zoltan P. Rona, MD: If this inflammation occurs in a joint, autoimmune arthritis (rheumatoid arthritis) develops. If it occurs in the brain, myalgic encephalomyelitis (a.k.a. chronic fatigue syndrome) may be the result. If it occurs in the blood vessels, vasculitis (inflammation of the blood vessels) is the resulting autoimmune problem. If the antibodies end up attacking the lining of the gut itself, the result may be colitis or Crohn's disease. If it occurs in the lungs, asthma is triggered on a delayed basis every time the individual consumes the food which triggered the production of the antibodies in the first place.¹³

Leaky gut syndrome can cause malabsorption of many important nutrients – vitamins, minerals and amino acids – due to inflammation and the presence of many potent toxins. This malabsorption can also cause gas, bloating and cramps and eventually such complaints as fatigue, headaches, memory loss, poor concentration and irritability. The set of symptoms known collectively as irritable bowel syndrome (IBS) – bloating and gas after eating and alternating constipation and diarrhea – has also been linked to leaky gut syndrome, as has eczema.

Because of our high stress lifestyles, many of us have an overworked, under-functioning digestive system, imbalanced intestinal flora and a continuous flow of intestinal toxins seeping into the bloodstream. Why then do some people seem unaffected, able to eat or drink just about anything they choose, showing no ill effects, while others experience discomfort and ultimately chronic disease? The difference has much to do with the functioning of the gallbladder and the detoxification ability of the liver, presented in chapter 5.

Notes

¹ John Matsen, ND, *The Mysterious Cause of Illness*, Fischer Publishing Corporation, 1987, p. 25.

² *Ibid.*

⁴ Doug A. Kaufmann, *The Fungus Link*, Mediatrix, 2000, p. 155.

⁵ Jack Tips, ND, Ph.D, *Conquering Candida*, Apple-A-Day Press, 1995, p. 37.

⁶ *Op. Cit.*, Kaufmann, p. 148.

⁷ Trent W. Nichols, MD and Nancy Faass, MSW, MMPH, *Optimal Digestion*, Quill, 1999, p. 147.

⁸ *Ibid.*, p. 148.

¹⁰ William Welles, DC, "The Importance of Squatting" (unpublished article).

¹¹ Elizabeth Lipski, MS, CCN, *Digestive Wellness*, Keats Publishing, Inc., 1996, p. 778.

¹² Wendy Marson, "Gut Reactions," *Newsweek*, November 17, 1997, p. 95–99.

¹³ http://www.naturallink.com/homepages/zoltan_rona/leaky

Chapter Summary

As our figure 1 flow chart indicates, impaired digestion leads to intestinal toxemia, wherein bacteria act upon undigested food in the gut, producing endotoxins. Intestinal toxemia can lead to an overgrowth of putrefactive bacteria and often *Candida*. Overgrowth of *Candida* is often accompanied by parasites. Proliferation of these opportunistic organisms further upsets the bacterial balance in the intestines. An overgrowth of pathogenic bacteria can cause irritation of the intestinal tract, tissue damage and impaired circulation, any of which can lead to gastrointestinal inflammation.

The intestinal wall cannot renew itself without sufficient beneficial flora to ferment dietary fiber into short-chain fatty acids. Leaky gut syndrome occurs when the mucosal lining of the intestinal tract becomes porous and irritated. As time passes, the breakdown in the intestinal mucosa can result in the passage of undigested food particles, toxins, parasites and *Candida* by-products into the bloodstream. This can lead to a weakened immune system, digestive disorders and, eventually, chronic disease.

Complementary Modalities –

Section 1 - Breath Work - by Connie Allred
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- Internal Environment Institute

This Chapter on breath is a compilation of principles and teaching. I have taught and proven to be successful.

Thanks to all my Friends, Clients, and health Practitioners, who walked the milestones of live with me.

Your For Better Health Naturally,
Connie Allred

Physical or Mental Breathing Your Choice

Breathing is the first thing we do in life. We can only live minutes without it. For most of us our first breath was a traumatic (the umbilical cord was cut too soon, some of us were turned upside down and slapped...). Breath is associated with pain. Hyperventilation is a sickness created by the fear of breathing by the birth trauma. We are all shallow breathers. Breathing in oxygen is breathing in energy, or life force.

Rebirthing, which has now evolved into what is called Conscious Breathing is a growth process using the breath as a vehicle for gradual expansion. Some call it therapy, some call it exploration of spiritual and psychic realms and some call it a rejuvenation of the physical body.

Conscious Breathing allows us to explore other parts of the mind we don't normally use. It can act as a catharsis, releasing stored trauma. It can open the doors to joy, reliving and going through the pain of the first breath. It can facilitate the "witness state", where one can be free of agitation.

1. Are you breathing? Are you breathing in through your feet?
2. Are you breathing from the core of the earth? You start to die in three minutes without breath?

Breathing Excise: This can be accomplished by lying down or standing upright.

Feet slightly wider than shoulder width, facing straight ahead, with knees slightly bent. Check the erectness of trunk. Now wiggle your toes; relax your feet making them flexible. Mentally grab a hold of the earth with your feet. On the count of eight, open mouth and draw the in breath

1. Breath through the feet
2. Pulling breath through the knees
3. Then through the hips
4. Up through the abdomen
5. Then through the lungs
6. Pulling through thyroid
7. And then the pineal
8. Ending at the crown of the head

Return the breath down the spine with a soft push, through the relaxed rectal muscle down the back of the legs, into the feet ending deep into the earth.

Breathing Instructions To Heal The Intellectual Center

The secret is to breathe the thought out of the head and push it down through the body on a five count. Fill the body with breath, pulling it from the (1) feet, (2) knees, (3) pelvis, (4) abdomen, (5) chest, clear to the top of the skull. On the exhale, push relaxed breath down through the (1) gut (truth center), (2) pelvis, (3) knees, (4) feet, (5) through the surface of the earth into the core of the earth.

Projection

The intuitive projection part of the nervous system is concentrated at a small point in the center of the forehead between the eyes. It is here that we concentrate the thought energy before sending

it out to interact with other radiant energy. The question must be set clearly in your mind before projecting it out. A confused mind will produce confused answers. One missile projected at a specific target will bring better results than ten aimed at random.

The process is illustrated here:

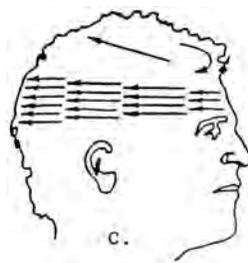
(a) Slow your scattered thoughts.



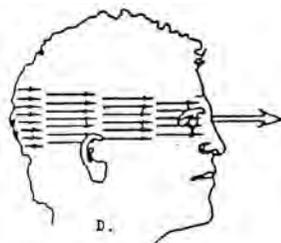
(b) Stop your mind from hopping about like a monkey.



(c) Begin to concentrate on one question only.



(d) Let this thought occupy your total concentration.



(e) And finally send out a concentrated pure thoughtwave.

To heal this center, oxygen energy must be used often, several times each hour. Put a rubber band on your wrist and snap it each time you look at it as a reminder to breathe in life.

Accept it readily, not allowing any other thought to change it.

Conscious Connected Breathing

- * Teaches a simple, relaxed breathing rhythm that enables you to restore the power of the breath.

- * Results in a free and full breathing.

- * Gently releases the symptoms of physical and emotional stress.

- * Expands sense of self-love, creativity, and inner peace.

- * Allows you to correct the breathing mechanism that has been restricted through accumulated tensions and fears.

- * Restore our natural breathing capacity.

You can switch out of “irregular shallow breathing pattern” chronic anxiety and stress into a deep, steady “confident breathing rhythm” that provides an efficient oxygen supply.

The central nervous system and brain requires 20% of the total oxygen intake. Considering we breathe approximately 23,000 times a day, why not make the most of this vital function?

Normally, you inhale enough air to get by. You aren't providing enough energy to gear up to potential. Thus the battery runs down with shallow breathing.

Proper breathing dissolves negative, suppressed thoughts and replaces them with thoughts

of self-acceptance and love. The process is a sage and gentle way to love yourself

It is an effective self-help tool to achieve profound and lasting change.

Results

1. Free, uninhibited breathing which replaces previously shallow breathing.
2. Automatically breathe instead of holding the breath under stress.
3. A successful, easy way to manage stress in all areas of your life.
4. Greater love and security in your relationship with yourself and other.

Posture And Rocking And Balance Stretch

For the release of the downward circulation of energy in the body which govern all expelling functions of gases, liquids and solids. Free the back pressure from the heart.

This posture is the final stage of many gentle efforts of squatting which stretches the muscles by degrees and Not by force. For this position the feet are fairly close together to obtain more support on the colon from the thighs, for the final stretch with the breath from the inside, the downward force or free circulation is activated by this posture, Gravity assists the elimination of liquids and solids. Three Atmosphere in the body are acted upon all at once in the final stage, which makes the downward currents of energy move by releasing the most negative area blocks first in the calves of the legs. The neutral pole of this principle in the colon, which becomes storage for gases, pressed by the thighs, arm pulls inward on the knees, push out the gases held in the patella. When knees are cold indicate gases trapped in the patella. The positive pole is the chest brachial plexus is the governor. The arm pull



must stretch the area between the shoulders so it is felt. Then a deep breathe can be used to stretch all the spinal muscle. The head pulls forward, on all these tissues. The response will be felt at once, even vertebrae will adjust themselves naturally as by an inner lift. Gases will roll, and liquid and solids follow the air block release. A rocking motion is now added forward and backward and from side to side as well as a turning rotation if possible.

The object is the release of the blocks in the tissues by motion while these fields are in proximity under a polarity action as well as a muscular pull. Tone and freedom in the pelvis is objective. The posture is easier with shoes on at first. Try barefooted later as it gives more stretch, clothing must be free. Only practice conquers and accomplishes. Three minutes several times a day gives good results.

When a person feels tired, restless and cannot relax to go sleep or feels indisposed in any way could mean that the energy currents of the body are not operating, as they should. Taking the postures for just a few minutes, will start the current flow and will make resting a real pleasure, FEET SHOULD BE FLAT ON THE FLOOR.

Breath Sounding -Lymphatic Brushing

Throat / Epiglottis -A door-like flap that covers the entrance of the larynx when an individual swallows, thus preventing food from entering the airway. The throat is communication and self-expression. Freeing up tension in this area promotes truth, loyalty, honesty of expression and reliability.

Technique: Stimulate the throat by making sounds, which also stimulate the vagus nerve to help the colon to release. Try a sound like “00000” during the colonic session and notice the release.

Cardiac Sphincter -A sphincter is a circu-

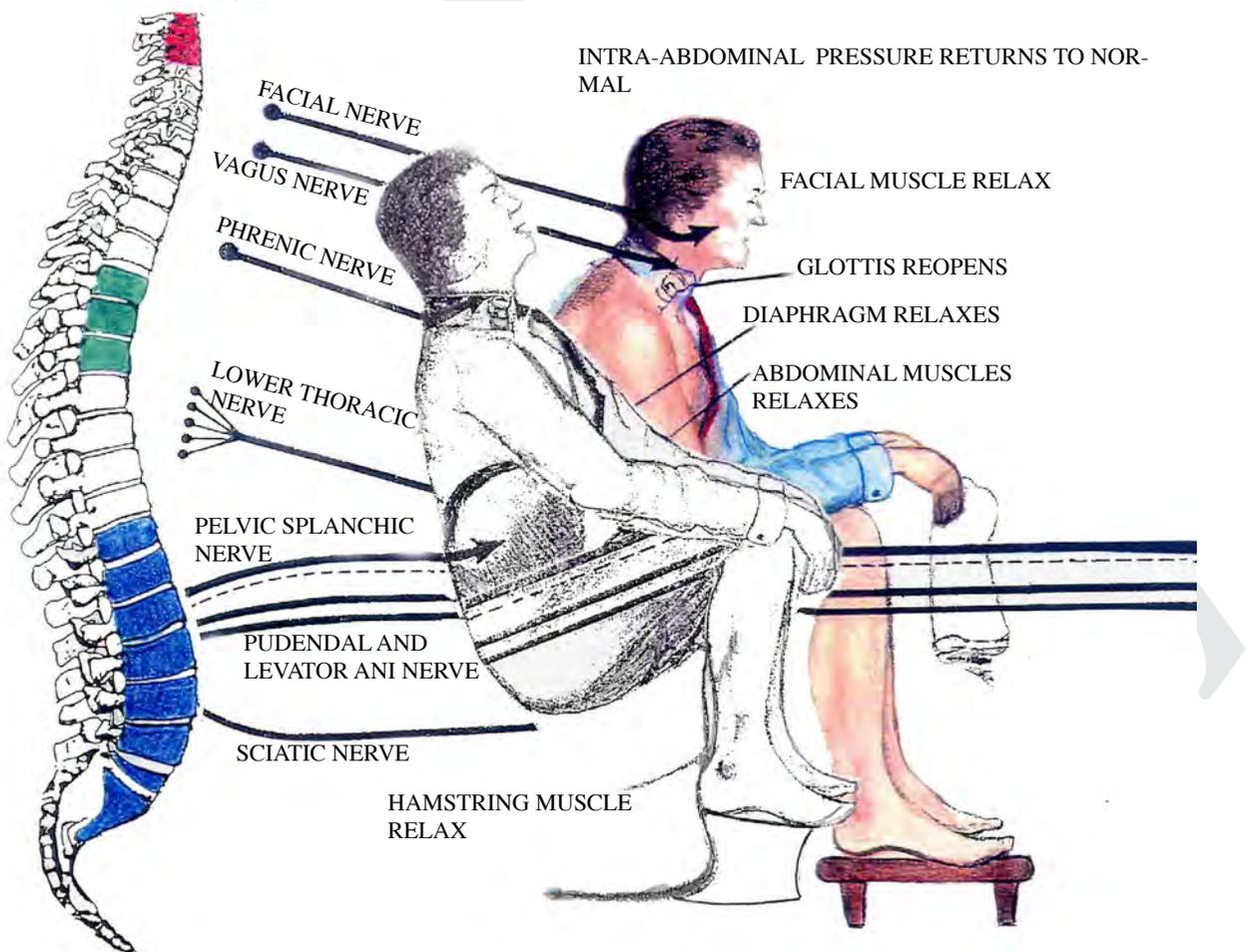
lar muscle constricting an orifice or opening. Normally when a sphincter is contracted, it closes the orifice. The cardiac sphincter surrounds the lower esophagus at the opening of the stomach.

Technique: To help relax and open this area, make the sound “AAAAA” and press directly down with the fingers or heel of the hand. The solar plexus represent mental thinking and ambition. Releasing this area inspires the mind and helps reasoning.

Pyloric Sphincter -This is the thickening of the muscular ring around the pyloric orifice.

Technique: Direct thumb pressure (as deep

Breathing for Proper Elimination



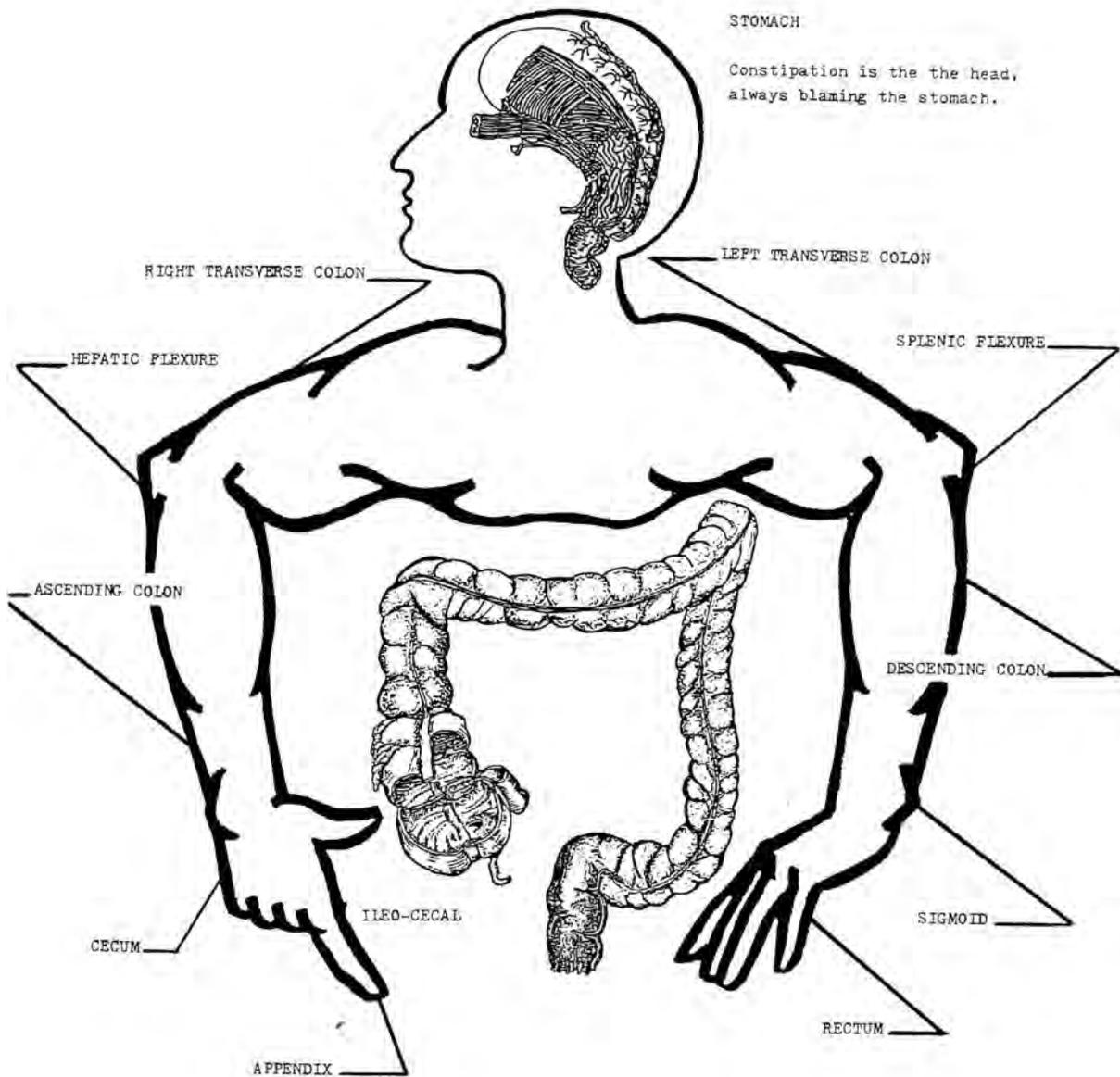
It takes twelve vertebrae to have an elimination

as the fingers will go without pain) and a very deep abdominal inhale, with a sudden forceful exhale with a sound will force this sphincter open. You can actually hear the chyme moving and entering the duodenum.

The ileocecal valve is between the ileum and large intestine-and it prevents the back flow of intestinal contents. It is composed of two membranous folds. The ileocecal valve should be closed during a colonic.

Ileocecal Valve According to Taber's Cyclopedic Medical Dictionary, a valve is found in a hollow organ or passage that temporarily closes in order to permit flow of fluid in one direction only.

CORRELATION



Technique: This valve is closed by cupping the cecum with the right hand and gently brushing the hand upwards towards the heart, to the left shoulder. Cup the shoulder for at least 10 seconds the same way that you cupped the cecum. Any work done on areas below the navel cheers and relieves emotional tension. The sound is “EEEEEEEEEE.”

Hepatic and Splenic Flexures -A flexure is a bend. The bends in the colon form junctures between sections. For example, the hepatic flexure, or right flexure of the colon, forms the junction between the ascending and the transverse colon. These bends can be cause for concern. Gases and feces can get trapped in and between these bends. As gravity pulls the intestines down prolapsed colon can occur. This really deepens the bends. Constipation backs feces up into the transverse colon that can cause prolapse. It is essential that we open the flexures to assist the colon to release.

Technique: Start by wrapping your hands around the splenic flexure. The splenic flexure is around the back. Lift above and below the rib cage. Remember to always lift upwards. Across the transverse, lift, lift, lift. Pressing down only closes the flexure even more. Lift the hepatic flexure. Reach around to the back of the ribcage and open from the front. You can work gently or deeply here. Teach your clients to work on there own colon this way -lift, lift, lift.

Sigmoid Flexure -An S-like loop of the descending colon as it joins the rectum. Areas near the base of the spine represent creative and sexual processes. When the client is on the fill cycle during the colonic and can't take much water, set to empty and work on the sigmoid area. It may be blocked.

Technique: Cup the Sigmoid and lift up, press down gently. Feel for gas and hard feces trapped here in the sigmoid. Use your fingers to make circle on the sigmoid. For overweight clients, work under the fatty areas.

1 PRIORITY

B R E A T H E

B R E A T H E

B R E A T H E

B R E A T H E

B R E A T H E

B R E A T H E

B R E A T H E

B R E A T H E

to inhale and exhale; to live; to inspire and infuse (breathe life into)

Complementary Modalities –

Section 2 - Reflexology - by Suzanne Gray and Lotie Saenz, N.D., LVN, MT

What is reflexology

Reflexology is an ancient modality of healing and relaxation. Very similar to acupuncture, reflexology is based on the Chi (life force) in the body along pathways of meridians or zones. When a blockage occurs, health challenges can be a result. Reflexology, allows the energy to open and to flow fully. These pathways (meridians or zones) are invisible channels of energy connecting to the major body organs, (See diagram 1 & 2)

Origins

Reflexology has been around for centuries. It has been practiced in India, Egypt, Africa, China, and Japan.

In the early 1900's, Dr. William Fitzgerald was the first medical doctor to use reflexology. Dr. Fitzgerald divided the foot and body into five longitudinal zones. Zone 1 consists of the big toe and thumb bilaterally, The organs within this longitudinal zone would be in Zone 1. The other zones would continue to move out to the small toe and finger (Zone 5).

In the 1930's, a physical therapist Eunice Ingham modified the zone therapy to the feet because the zones were easily accessed.

How it works

There are many schools of thought as to how reflexology work It could be the stimulation of the lymphatic, circulatory, nervous system or energetically a combination of these systems. Practitioners do agree that reflexology relieves tension and allows the Chi or energy to flow freely in the body.

By applying pressure to the feet, the sensory receptors respond by producing energy traveling to the spinal cord and dispersing throughout the nervous system. Another perspective is as the body relaxes the blood vessels open and improves circulation.

Sometimes, people prefer reflexology to massage because it is less intrusive. There is also a possibility of endorphins being released into the bloodstream, reducing the pain and a good sense of well being.

Sessions

Sessions can be 30 minutes to an hour. The client can be in a reclining chair or on a message table with the head elevated.

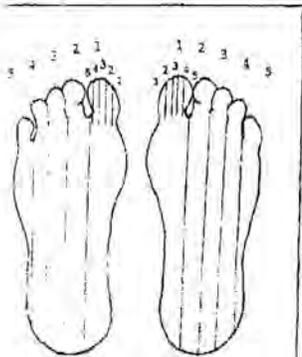
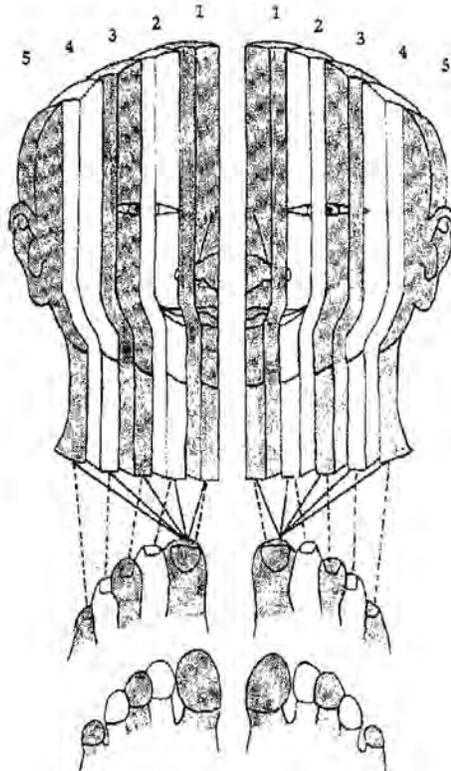
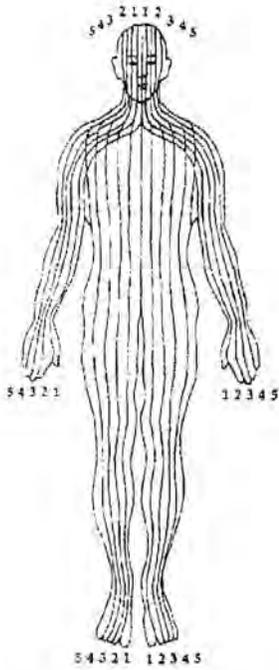
The therapist will start with a foot message then use the thumbs and index fingers to apply pressure to specific areas. Some areas maybe more tender than other areas.

A client may have a tingling sensation in the area of the body that corresponds to the reflex point.

Since the blocks are being released, flu like symptoms may occur because waste products are being released on a cellular level through lymph, respiratory, and excretory systems. It is important to drink plenty of water and allow the body to detoxify for a couple of days after the first session. The practitioner will suggest how many treatments are needed after the initial visit.

Reflexology is also a great adjustment during a full body massage, colon therapy and facial treatment.

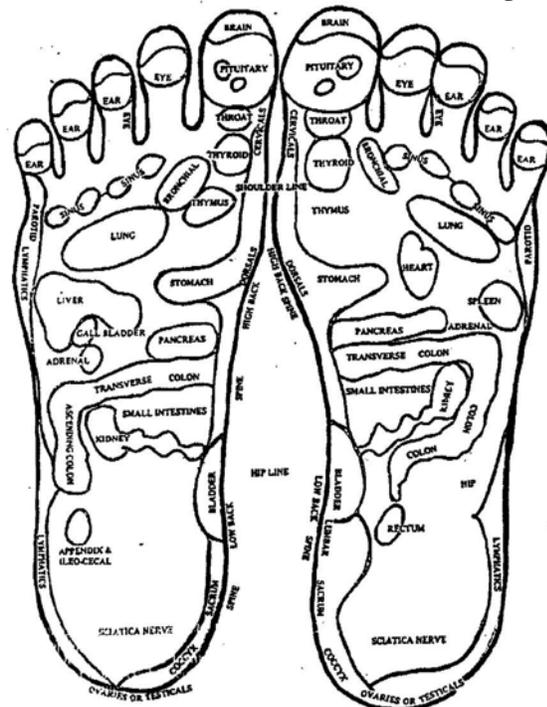
Diagram 1



RIGHT FOOT

LEFT FOOT

Diagram 2



Reflexology Materials Provided by Lottie Saenz, N.D., LVN., MT.
 Workshop Sponsored by:
MIND BODY Naturopathic Institute
 Massage And Colon Hydrotherapy Training
 10911 West Avenue
 San Antonio, TX. 78213

Complementary Modalities –

Section 3 - Aromatherapy - by Marti Montero

Aromatherapy

Aromatherapy is a term meaning therapy using aroma or aromatic substances, and was coined by Dr. Rene Maurice Gattefossee a French Chemist who is considered the father of modern Aromatherapy. In 1937, he published a book, called Aromatherapy. He was mainly interested in medicinal and cosmetics uses of essential oils.

We have all experienced a variety of feelings in response to certain aromas, or smells. Just a whiff of apple pie or homemade bread baking can bring back memories and more notable the feelings associated with them. For me, nothing makes me feel better than smelling the air after a rain storm. Everything alive emits orders, plants, animals, humans. These odors effect on us have been known since ancient times.

The Egyptians walls show pictorial evidence of the use of essential oils. After the discovery that essential oils could be extracted from plants, research and continued development of the science of aromatherapy began.

The processes for extracting the oils are pressing flower petals to a fat form, cold pressing, soaking in alcohol, to distilling by passing steam through a vat containing the plant materials, then condensing the steam.

Steam distillation has become the most widely used method for extraction today. As the condensed liquid cools, a layer of aromatic oil floats on the surface. Essential oils are not the same in degrees of oiliness as cooking oils. Essential oils can be clear to light shades of green, blue or dark brown. The water on which the oil floats is known as floral water, and is also used for its healing properties. The oils obtained do not mix with water, and are used on their on own or combined

with other essential oils. The oils can be used for their herbal healing values or as perfume oils.

Essential oils have many uses for natural healing. They are easily applied, just drop on the skin and gently massage in. However, one must be sure that they acquire oils that have been properly steam distilled at low temperatures so as not to destroy the value of the oils. Each oil carries a measurable vibratory value.

The following lists the many values and uses of essential oils. To begin to use oils, one should become acquainted through study with the many various oils and their uses and properties.

Essential oils go into the body and enhance the ability of the body to do what it is supposed to do naturally.

Essential oils can be thought of as “transport mechanisms”. When used on our bodies, essential oils act as catalysts to encourage blood cells to accept nutrients and to carry and deliver more oxygen.

Essential oils have the ability to assist the delivery of nutrients into our bodies and may be the missing link the supplements more readily available in our bodies.

Essential oils are soluble in the lipids of the cell membranes. They also bond with nutrients of value and work as a catalyst and carrying system to deliver these nutrients inside the cell, while assisting in the efficient disposal of toxic wastes.

Essential oils are oxygenators, making oxygen more available to tissues. The opposite of oxidation, the loss of oxygen.

Essential oils are free radical scavengers and go after areas of oxidation.

Essentials oils are the highest known source of antioxidants.

Essentials oils are immune system supporters.

Essential oils can be thought of as enhancers of energies in the electromagnetic energy field surrounding the physical body.

Essential oils are antibacterial, antiviral, antifungal, antiseptic and are vermifuge agents (antiparasitic). Bacteria cause the deterioration and degeneration of tissue. Essential oils are quickly absorbed through the exterior of the body and can quickly create an environment which is not conducive for bacteria, virus or fungus to grow and develop. Essential oils can be thought of as a protecting mechanism for the human body, just as they are for plants.

Essential oils are multi-functional so that they have a wide spectrum of application. They work for the need that is present. If no need is present, there is minimal reaction.

Essential oils are absorbed and go to work in the body within seconds. They can affect an organ in 3-5 seconds from contact to results (mixed in hand and applied). Essential oils stay in the body about 20 minutes to two hours, and leave no residuals. While oils are not accumulative in the body. Their frequency and effect is cumulative, the effect can last up to five months.

You can see that essential oils have the potential for many benefits, and I encourage you to seek out courses and study their uses.

Complementary Modalities –

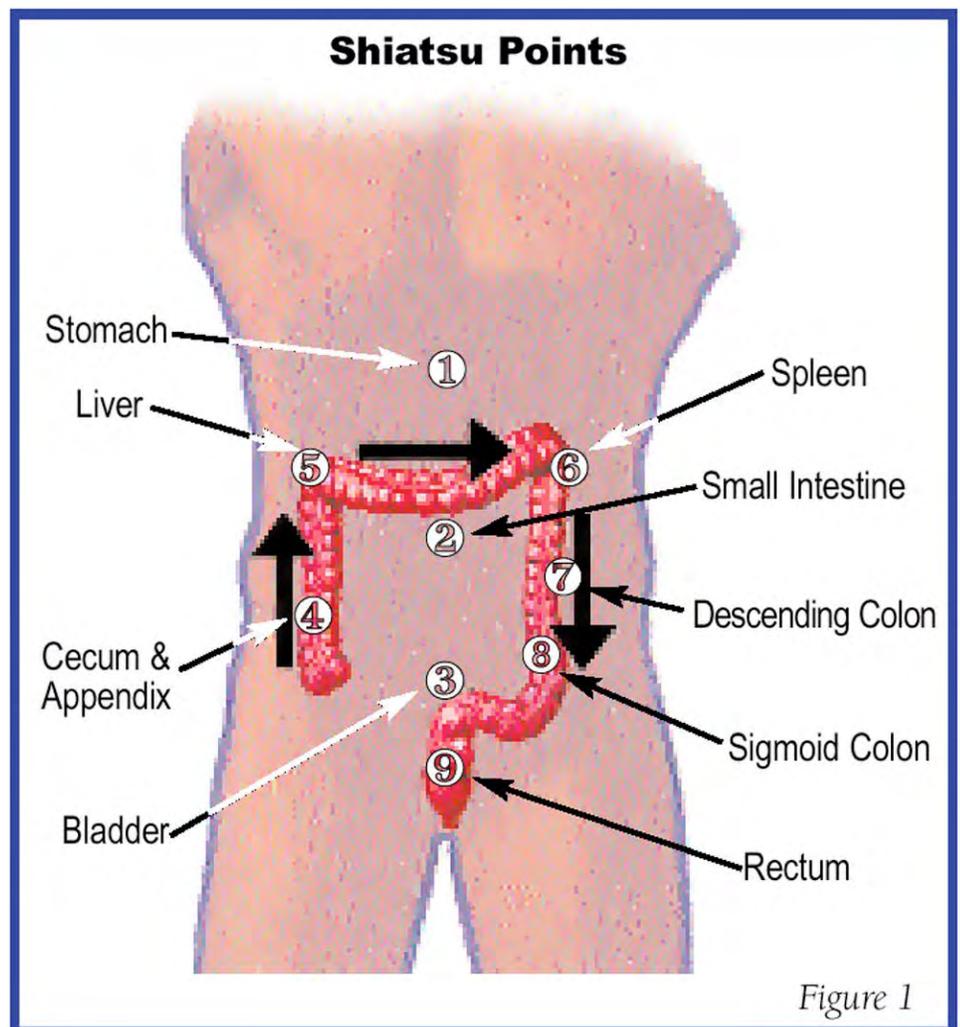
Section 3 - Shiatsu - by Brenda Watson

Shiatsu

A form of Asian massage known as Shiatsu has been shown to be effective in increasing abdominal strength and function. The following instructions are provided for this type of massage:

Have the recipient lie face up with the knees bent. Concentrate and enter a peaceful state, wishing well-being upon yourself and the other person. Use the pads of your fingertips and compress gently but securely, one hand pressing over the other, the points designated in figure 1. Hold each point for at least seven slow, full breaths. Let up slightly on the inhale, press on the exhale. You and your partner should breathe together in rhythm. Breathe fully, allowing each exhale to relax the body and mind more and more. Repeat again at each point...

Follow with European effleurage [stroking movement], using a massage oil or lotion. Place your fingertips just below the navel, pause, then slowly and gracefully begin an outwardly rotating, clockwise spiraling movement. Make about five circular movements, and stop just above the pubic bone. Repeat this at least seven times; better yet 15 or 20. Practice, become graceful with the movements, and spread the health.²



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I-ACT Policy Statements

I-ACT recommends the use of currently registered FDA equipment and only disposable speculums, rectal tubes, or rectal nozzles. However, should the Therapist use reusable speculums, these speculums should, at a minimum, be autoclaved for sanitation and cleanliness (30 minutes). Additionally, the autoclave unit must be tested and inspected by competent authority at least four times per year- maintain documentation. (Under NO conditions should a disposable speculum or rectal tube be reused).

I-ACT recognizes that the FDA classifies equipment used to instill water into the colon through a nozzle [speculum/rectal tube] inserted into the rectum to evacuate the contents of the colon into three distinct classes; Class I (Enema Kits), Class II and Class III (Colon Irrigation Systems). Follow the guidelines of your manufacturer, as approved by the FDA for the type of equipment (devices) you are using. Make no claims as to the use of your device other than those approved by the FDA. The main difference between Class I and Class II devices is that Class I devices do not have any safety features and manufacturers of Class I devices may not have any third party oversight as they do not have to comply with the good manufacturing practices that are required of Class II manufacturers. The FDA requires Class II devices to be sold on or at the order of a physician or healthcare practitioner. This may be different in each state. Purchase equipment at your own risk. Ensure you are in compliance with your local, state, federal and country guidelines. Ensure that equipment you purchase is cleared for use in your country.

I-ACT recognizes there are two distinct types of colon irrigation systems; open and closed systems. However, it is I-ACT policy that the colon hydrotherapist / technician is always in attendance / or is immediately available to the client throughout the session. The degree of assistance is to be in compliance with the instructions of the manufacturer of the equipment as registered with the FDA, and/or as directed by a physician.

The policy on insertion is to follow the instruction of the referring physician; the guidelines of the manufacturer as approved by the FDA; or the directives from the authority of your city, county, state, or country ordinances.

I-ACT recommends that you do not put the initials (CT) for colon hydrotherapist after your name, write it out in full. According to most state laws, putting initials after your name is not allowed unless you are licensed or have a degree from an accredited professional school.

I-ACT does not and cannot approve any literature, manuals, or other documents. The only materials that are I-ACT approved are materials that are generated and published from the I-ACT office.

Advertising copy which states or implies that colon hydrotherapy can treat any disease, promise cure for any disease, or that makes unsubstantiated medical claims SHALL NOT be used.

Additionally, I-ACT recommends each therapist not using FDA registered equipment consider upgrading their equipment to FDA registered equipment in the very near future.

Standard Operating Procedures, Regulations & Guidelines

For

**I-ACT Recognized Schools
&
I-ACT Recognized Colon Hydrotherapy Establishments**

OF THE

**INTERNATIONAL ASSOCIATION
COLON HYDROTHERAPY
(I-ACT)**

These guidelines are a compilation of material gathered from experience and several colon hydrotherapy manuals to establish a mutual understanding. Thanks to all contributors.

October 2012

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Purpose

(1) These Business and Professional Regulations are promulgated in an effort to protect the health, safety and welfare of the public by ensuring that only those who are qualified by certification to administer colon hydrotherapy may do so.

(2) Prior to the administration of colon hydrotherapy, any person shall be required to present certification to the Board of successful completion of a course of study approved by I-ACT through an I-ACT approved colon hydrotherapy school or instructor and certified at the Foundation Level.

Scope of Practice

Colon Hydrotherapy is the introduction of warm, filtered and temperature regulated water into the colon, the waste is softened and loosened, resulting in evacuation through natural peristalsis. This is repeated several times during the session.

Definitions

(1) “Board” means the Board of Directors of the International Association for Colon Hydrotherapy (I-ACT).

(2) “Education Committee” is a group of dedicated members of I-ACT who volunteer their service to recommend educational guidelines to the Board.

(3) “Establishment” means an appropriate site or premises, or portion thereof, where a colon hydrotherapy session occurs

(4) “Colon Hydrotherapy” is the introduction of warm, filtered and temperature regulated water into the colon, the waste is softened and loosened, resulting in evacuation through natural peristalsis. This is repeated several times during the session.

(5) “Student” means a person studying colon hydrotherapy at any of the four Levels of training (i.e., Foundation Level, Intermediate Level, Advanced Level, or Instructor Level).

(6) “Instructor” means a certified colon hydrotherapist who plans to carry out the training and instruction of a student for a limited period of time. Instructors may train one to two students at a time.

(7) “Certification” means the procedure by which a colon hydrotherapist applies to the Board for approval documenting the student has successfully passed the I-ACT certification examination and fulfilled all requirements for each level of certification.

(8) “I-ACT recognized colon hydrotherapy school” means a facility which agrees to comply with the training and curriculum as recommended by I-ACT. Each school must be in compliance with the laws of their state. Schools may train as many students as they have room for.

(9) Equipment Classification
Enema Kit

From the code of federal regulations (CFR) 876.5210 Enema Kit. (

a) Identification. An enema kit is a device intended to instill water or other fluids into the colon through a nozzle inserted into the rectum to promote evacuation of the contents of the lower colon. The device consists of a container for fluid connected to the nozzle either directly or via tubing. This device does not include the colonic irrigation system (Sec. 876.5220).

(b) Classification. Class I (general controls). The device is exempt from the premarket notification procedures in subpart E of part 807 of this chapter subject to Sec. 876.9. The device is exempt from the current good manufacturing practice regulations in part 820 of this chapter, with the exception of Sec. 820.180 of this chapter, with respect to general requirements concerning records, and Sec. 820.198 of this chapter, with respect to complaint files. [48 FR 53023, Nov. 23, 1963, as amended at 65 FR 2317, Jan. 14, 2000]

Colonic Irrigation System

From the code of federal regulations (CFR) Sec. 876.5220 Colonic irrigation system.

(a) Identification. A colonic irrigation system is a device intended to instill water into the colon through a nozzle inserted into the rectum to cleanse (evacuate) the contents of the lower colon. The system is designed to allow evacuation of the contents of the colon during the administration of the colonic irrigation. The device consists of a container for fluid connected to the nozzle via tubing and includes a system which enables the pressure, temperature, or flow of water through the nozzle to be controlled. The device may include a console-type toilet and necessary fittings to allow the device to be connected to water and sewer pipes. The device may use electrical power to heat the water. The device does not include the enema kit (Sec. 876.5210).

(b) Classification. (1) Class II (performance standards) when the device is intended for colon cleansing when medically indicated, such as before radiological or endoscopic examinations. (2) Class III (premarket approval) when the device is intended for other uses, including colon cleansing routinely for general well being.

(c) Date PMA or notice of completion of a PDP is required. A PMA or a notice of completion of a PDP is required to be filed with the Food and Drug Administration on or before December 26, 1996 for any colonic irrigation system described in paragraph (b)(2) of this section that was in commercial distribution before May 28, 1976, or that has, on or before December 26, 1996 been found to be substantially equivalent to a colonic irrigation system described in paragraph (b)(2) of this section that was in commercial distribution before May 28, 1976. Any other colonic irrigation system shall have an approved PMA in effect before being placed in commercial distribution. [48 FR 53023, Nov. 23, 1983, as amended at 52 FR 17738, May 11, 1987; 61 FR 50707, Sept. 27, 1996]

Qualifications for Individual Certification

(1) Any person is qualified for certification as a colon hydrotherapist who:

(a) Has presented certification to the Board of successful completion of a course of study approved by I-ACT through an I-ACT recognized colon hydrotherapy school or instructor and certified at the Foundation Level; or, who has presented documentation they have been practicing in the field of colon hydrotherapy for more than one year and have performed more than 100 colonics in the past year and has passed a mandatory eight (8) hour course put on by an I-ACT instructor or school.

(b) Has taken the I-ACT written test and received a passing grade.

(c) Has completed the remaining requirements as directed by the I-ACT Board.

Examinations

(1) A written examination for each level of certification shall be offered by I-ACT at least once yearly (at the annual convention), at regional meetings, at I-ACT recognized schools or with an I-ACT Instructor. There is a fee of \$75.00 for each level of examination.

(a) The testing for Level 4 (Instructor Level) requires the completion of a 60 hour course put on by an I-ACT school or with and I-ACT Instructor. During that training, the individual will teach for a total of four instructor hours. Three {3} hours may be accomplished at an I-ACT recognized school, or with an I-ACT Instructor (it is desired that minimum of 8 individuals attend the instructor presentations). One hour must be completed at an I-ACT Convention (at a minimum, the presenting instructor should wear business casual attire). In addition, the prospective instructor must attend a mandatory two hour instructor workshop provided at the convention. After attending the mandatory 60 hour Instructor class, the instructor candidate may practice the one hour presentation at Regional meetings.

(2) Upon an applicant's passing the test and paying the initial certification fee and fulfilling all requirements for I-ACT Level 1, I-ACT shall then certify the individual at the Foundation Level. Completion of the requirements for Level 2, 3 or 4 will cause I-ACT to certify the individual at that level.

(3) All certification examinations must be proctored and an accurate record of each examination shall be made; and that record, together with all examination papers, shall be filed by I-ACT or the school certifying the examination and be kept indefinitely.

(4) Members testing at the convention will be allowed to take a test 2 times during the convention. If the member fails the exam 2 times they will be required to show additional training before they can retest. They may retest and pay \$75 for the test. If they fail this test they will be required to wait 6 months and show they have additional training. Before they can retest and pay an additional \$75 test fee. If the person does not pass this exam they will be required to retrain with A & P at a school, instructor or tutor and present a transcript.

(5) Maximum time allowed for Level 1 & 2 exam shall be 2 hours, and maximum time allowed for Level 3 exam shall be 3 hours. This time may be extended by the proctor as required for International students that English is not their first language or if the student has documented learning disabilities .

Posting of Certificates

(1) All members shall post their I-ACT Certificate in their colonic establishment for easy viewing by the public.

Inactive Status

(1) A member becomes inactive when an I-ACT member fails to renew their I-ACT membership, within 90 days of expiration of membership and pays an Inactive status fee of \$25.00 per year. Once a member goes inactive, they may reinstate their status by paying current years dues. However, any individual that allows their membership to I-ACT to be terminated automatically loses all levels of certification they had received. This individual must retest on each level before that level of certification may be reinstated.

I-ACT Recognized Colon Hydrotherapy School Criteria

(1) The Board shall adopt reasonable standards, for I-ACT recognized schools.

(a) An I-ACT school must have at least one certified I-ACT Instructor on staff, and all training shall be conducted or supervised by an I-ACT Instructor.

(b) The school shall teach colon hydrotherapy utilizing the I-ACT Syllabus for the Foundation, Intermediate, Advanced, or Instructor Level as appropriate to the class.

(c) All training must be performed - in person - by the instructor.

(d) The school must provide I-ACT testing at the completion of each course of training.

(e) The school must comply with all guidelines of the I-ACT's Standard Operating Procedures, Regulations & Guidelines.

(2) Any person, firm, or corporation desiring to operate a colon hydrotherapy school shall submit to I-ACT, accompanied by any information requested by I-ACT, an application for recognition fee as directed by the I-ACT Board. Additionally the school must submit proof that they are in compliance with all state laws.

(3) I-ACT retains the right to visit any recognized school as it deems necessary.

I-ACT Zero Tolerance Policy

Background: The International Association for Colon Hydrotherapy (I-ACT) recognizes the seriousness and extent of injury that any form of abuse may cause another and therefore supports Zero Tolerance of such abuse in any form: this includes any type of harassment, verbal, physical, emotional, financial or sexual, by an I-ACT member colon hydrotherapist.

I-ACT endeavors to provide protection of the public interest by addressing client-member, member-student and member-member abuse openly. I-ACT strives to provide an accessible and sensitive reporting process, and establishes deterrents through the administration of a disciplinary process reflecting the serious nature of the violation.

This policy has been created to advise our membership that I-ACT endorses the Principle of Zero Tolerance for abuse in any form and to ensure members understand that abuse in any form is unacceptable and will not be tolerated.

In defining abuse, it is important for the professional to be cognizant of the imbalance of power that exists in the professional colon hydrotherapy environment. Clients often seek professional services when they are vulnerable or in a state of pain. A member of this profession has the 'power' by virtue of their authority, knowledge, access to privileged information and the influence they potentially hold over the client, to exploit. It is expected, therefore, that the professional will address the client's needs in a sensitive and caring manner in accordance with the Standards of Practice and the Code of Ethics for the profession.

I-ACT is also aware that the most productive and satisfying environment is one in which instruction and growth is accomplished in a spirit of mutual trust and respect. Harassment is a form of discrimination that is offensive, impairs morale, undermines the integrity of Client/Member and Instructor/Student Member relationships and may cause serious harm to the productivity, efficiency and stability of our organization and industry.

I-ACT members will maintain confidentiality of client information, unless given written permission by the client or ordered by the courts. I-ACT members will clearly represent their educational qualifications and inform clients of the limits of their license or certification. I-ACT members should refer clients to an appropriate professional for services if the treatment is not within their scope of practice. I-ACT members will use precautions to do no harm to physical, mental and emotional health of clients and associates.

Abuse can be defined as:

Harrassment

Harassment on the basis of a person's gender, race, color, ancestry, ethnic or national origin, age, disability, arrest or conviction record, marital status, sexual preference, military or organizational membership will not be tolerated. Every individual has the right to receive colon hydrotherapy services, education and training in an environment which is free from discrimination, intimidation, and all forms of harassment.

Verbal - Non Verbal

Verbal abuse may include but is not limited to, derogatory comments, sarcastic, demeaning or seductive remarks. It is also important to note that the tone of verbal communications may characterize how words are perceived. I-ACT members must be aware that a person's age; culture, socio-economic status and other particular sensitivities may affect how a client perceives communications with an I-ACT member.

Jokes, insults and innuendoes (based on race, sex, age, disability, etc.), and degrading sexual remarks, such as referring to someone as a stud, hunk or babe; whistling; cat calls; comments on a person's body or sex life, and/or pressures for sexual favors are examples of verbal abuse that is completely unacceptable.

Non-Verbal behaviors that are unacceptable could be gestures, staring, touching, hugging, patting, blocking a person's movement, standing too close, brushing against a person's body, any unsolicited touch or display of sexually suggestive or degrading pictures, racist or other derogatory cartoons, drawings or communications.

Physical

Using unnecessary force in the course of providing treatment or training.

All therapist members will have an understanding regarding the Ethics of Touch.

All therapist members should follow the guidelines of the manufacturer for equipment use.

All therapist members will be aware of the I-ACT policy on insertion.

Emotional

Where a member of the profession uses the position of power to intimidate or show insensitivity

toward the client or a student. Emotional abuse demeans the client or student in such a way as to lower their sense of personal worth.

Financial

The inappropriate use of a client's or student's funds, property or resources. May include such behaviors as:

- a. Attempting to, or actually persuading, deceiving, or threatening the client to part with their funds,
property or possessions;
- b. Recommending excessive treatments/trainings with no **clinical indication requiring the same;
- c. Use of a client's or student's money for purposes other than that intended by the client;
- d. Failure to provide the client or student a written refund policy and
- e. Failure to provide a refund for services if requested by client.

Sexual

I-ACT defines sexual abuse to include:

- a. Sexual intercourse or other forms of physical sexual relations between the member and the client or student;
- b. Touching of a sexual nature, of the client or the student by a member;
- c. Behavior or remarks of a sexual nature by the member towards the client; Exception: "sexual nature" does not include touching, behavior or remarks of a clinical nature appropriate to the service provided.
- d. Touch should be therapeutic in nature providing a necessary action related to the treatment for a desired result.

Policy:

I-ACT will investigate and act upon any complaints and information received dealing with allegations of abuse of a client in an effective, timely and sensitive manner.

In relation to those members found in violation of the Zero Tolerance Policy, I-ACT will uphold the sanctions mandated by the I-ACT Grievance Committee as approved by the Board. I-ACT is committed to imposing appropriate penalties to reflect the severity of the conduct of concern.

Disciplinary Guidelines

Grounds for Disciplinary Action

(1) Attempting to procure a certificate to administer colon hydrotherapy by bribery or fraudulent misrepresentation.

(2) Practice or offering to practice beyond the scope permitted by law or accepting and performing professional responsibilities which the certified colon hydrotherapist knows or has reason to know that he/she is not competent nor authorized to perform.

(3) Refusing to permit I-ACT to visit the business premises of the certified colon hydrotherapist on reasonable notice.

(4) Failing to keep the equipment and premises of the colon hydrotherapy establishment in a clean and sanitary condition on the inside and outside of the building.

(5) Conviction of felony after membership and certification.

(6) Behavior detrimental to the profession or goals of the association.

(7) Inappropriate advertising inconsistent with I-ACT guidelines.

(8) Three verifiable grievances that have gone through the grievance process and have been determined by the Board to have merit.

Disciplinary Action

When the Board finds any person is acting in violation of any rules, it may enter an order imposing one or more of the following penalties:

(a) Refusal to certify any person, but that person can reapply within 90 days with a new application fee of \$75.00.

(b) Issuance of a reprimand or censure by promulgated, unanimous decision of the Board.

(c) Revocation of a certificate and suspension of the right to hold themselves out as an I-ACT certified colon hydrotherapist.

It is understood that any investigation, decertification, or censuring of a member, may cause I-ACT to expend funds for that investigation and may result in an expense or a cost. The person or member involved will be expected to pay this cost within 30 days. If the fee is not paid it will cause expulsion for the applicant.

Grievance Policy

1) Grievances brought forth by the public will be considered for review by the grievance committee for issues involving the following criteria:

Those documents which define standards of behavior for I-ACT members, such as the Standard Operating Procedures, Code of Conduct, Zero Tolerance Policy, and By-Laws of I-ACT. (for example: complaints concerning scope of practice, ethics, advertising, facilities, cleanliness, and reuse of disposables. This is not an all inclusive list.)

A grievance must be in written form and signed.

2) Grievances brought forth by members of I-ACT against an Officer of the Board or Board Member, or fellow member:

Grievances considered will be those documents which define standards of behavior for I-ACT members, such as the Standard Operating Procedures, Code of Conduct, Zero Tolerance Policy, and By-Laws of I-ACT.

A grievance must be in written form and signed.

- 3) Grievances regarding I-ACT recognized schools will only be accepted if they pertain to, education, testing, non-compliance with the syllabi, and the Standard Operating Procedures, Code of Conduct, Zero Tolerance Policy, and By-Laws of I-ACT.

A grievance must be in written form and signed.

- 4) Grievances regarding manufacturers or products are not within I-ACT authority or responsibility.

- 5) Prior to filing a grievance, both parties seek amicable resolution. The initial approach to settling any issue is open communication. If the concern(s) is /are not resolved in a timely fashion, a formal grievance should be filed according to I-ACT procedures. The grievance should be in writing and contain information about the grievance, submission date, name, address, telephone or cell phone number of grievant, location, date, contracts (if applicable) and description of the problem.

Disclaimer: I-ACT assumes no responsibility, legal or otherwise, for the outcome and/or resolution of any grievance.

Grievance Committee Guidelines

These are the following steps that are followed by the I-ACT Grievance Committee (made up of I-ACT Board Members).

1. The office receives a grievance, logs it in and assigns a number. The office will then notify both the individual filing the grievance and the individual that the grievance was filed on that a grievance has been filed and they will be hearing from the Grievance Committee. The office then sends the grievance to the Grievance Committee for action.
2. A Committee member is assigned and notifies both parties who will be handling the grievance and will provide both individuals a projected timeline.
3. When tasked for information, the School, Instructor or Therapist filed against has 10 days to acknowledge receipt and make contact with the grievance committee member handling the grievance.
4. The School, Instructor or Therapist has up to 30 more days to send paperwork to support their side of the grievance.
5. If additional paperwork is requested by the Committee member, the School, Instructor or Therapist has an additional 10 days to supply this new paperwork.
6. Failure to respond to item 3 or 4 above will cause the School, Instructor or Therapist to be removed from the I-ACT referral list until the grievance has been resolved.

7. The Grievance Committee members makes a determination that:
 - a. there are no grounds or there is no basis for the grievance - in this case, both parties are notified and no action taken.
 - b. the grievance is valid. Both parties are notified and the grievance Committee member attempts to find a resolution between both individuals.
 - c. there is not enough information provided to definitely determine there were grounds for a grievance.
8. All grievances are reported to the Board (within 30-40 days). The Board will have the final authority to assign responsibility and take final action.
9. Both parties will be notified of resolution of the Board of Directors.

Whistleblower Policy

I-ACT has established a whistle Blower policy to protect its members and employees that notify the Board or members of a policy or activity that may be in violation of the law. In part, It states:

I-ACT will not retaliate against a member or an employee who, in good faith, has made a protest or raised a complaint against some practice of I-ACT, or of another individual or entity with whom I-ACT had a business/membership relationship, on the basis of a reasonable belief that the practice is in violation of law or a clear mandate of public policy.

I-ACT will not retaliate against an employee who discloses or threatens to disclose to a supervisor or a public body any activity, policy, or practice of I-ACT that the employee reasonably believes is in violation of a law, or a rule, or regulation mandated pursuant to law or is in violation of a clear mandate or public policy concerning health, safety, welfare, or protection of the environment.

Standard Operating Protocols

1. INDICATION FOR COLON HYDROTHERAPY: Must be in absolute compliance with the Code of Federal Regulations Title 21 for the Class of equipment in use. Use the indications approved by the FDA for your equipment (ie, constipation, etc.)
2. EFFECTS: Colon irrigation.
3. ROUTE: Administered rectally.

4. FREQUENCY: Based on the client's response and need as indicated by their physician or healthcare practitioner.
5. DURATION: Time required for administration is normally based upon the needs of the client however, in all cases the guidelines of the manufacturer should be followed.
6. RELEVANT HAZARDS: To ensure the highest level of safety for the consumer, always use FDA registered equipment.

There are reports of cross contamination due to improperly cleaned / disinfected equipment or table on equipment that was not registered with the FDA.

Always follow your manufacturer guidelines for cleansing your equipment to ensure there is no spread of disease, etc.

Improper use of the equipment by not following the guidelines of the manufacturer may cause injury (ie. alleged perforation of the colon).

Under no circumstances should single use devices be reused.

Under no circumstances should FDA registered equipment be modified or altered without the manufacturer's permission.

7. CONTRAINDICATIONS: Follow the guidelines of your manufacturer.
8. POSSIBLE SIDE EFFECTS: Weakness, nausea, vomiting, hunger, flatulence, fatigue, dizziness, abnormal energy, etc.
9. PRECAUTIONS: None. Follow the manufacturers guidelines for your equipment.

Referring Healthcare Provider

1. All records should be made available to referring or consulting health care providers associated with the client and their therapies provided that a properly written release form is executed by the client beforehand.
2. Therapies for referral clients SHALL conform to the prescription or instructions of the referring health care giver. Client responses to indicated therapies and findings associated with all aspects of colon hydrotherapy care SHALL be reported to the referring health care giver on request.

Under no circumstances will the colon hydrotherapist prescribe or suggest other therapies, additional sessions, procedures, nutritional supplements, etc. to the client that were not originally prescribed or ordered by the referring physician or health care provider. The colon hydrotherapist may communicate to the referring health care professional an additional number of sessions to facilitate the prescription instructions

The Session

1. Follow the instructions for the session as recommended by the prescription and consistent with the guidelines of the manufacturer of your equipment.
2. All techniques, methods, and procedures that are to be used during the colon hydrotherapy session must be completely and thoroughly explained to the client in advance. In no case should any additional technique be used without the permission of the client.
3. The client must be attended, or the therapist will be immediately available to the client, during the session at all times.
4. The Therapist must be professionally groomed and attired. The client SHALL be modestly draped with an acceptable gown or covering during all procedures. Techniques used in colon hydrotherapy procedures SHALL be adopted with the attempt to maximize the client's overall personal privacy and modesty, to maintain the client's dignity, state of comfort and ease.
5. The Therapist must ensure there is no action, language, or behavior that may be interpreted as a sexual advance.
6. The Therapist must ensure they stay in their scope of practice or areas that they are licensed by law to practice. Do not exceed the scope of practice for any license you may possess.
7. Even though gloves are used, hands and nails must be thoroughly washed with an antibacterial, antifungal soap before and after each client, and as necessary during the session.
8. When using Class 1 FDA registered equipment, the client must insert and remove the speculum/rectal nozzle; for Class 2 FDA registered equipment, follow the guidelines/instructions of the manufacturer of your equipment.
9. To ensure the safety of the client, follow the manufacturer recommendations for procedures to be used during the session. In no case should the recommendation of the manufacturer be exceeded or ignored.
10. At the end of the session, clean, sanitize, and disinfect the equipment according to guidelines provided by the manufacturer of your equipment.

Physical Premises

1. The design and physical layout of the premises, installation and maintenance of equipment, plumbing, electrical wiring, egress and ingress routes, parking and public access should conform to all local, county, and state zoning regulations. All facilities should have the proper occupancy permits and approvals by the local Board of Health, where required.

2. A separate client waiting area should be maintained.
3. Restroom facilities should be provided for and located at a convenient distance from the session room table. The restroom should have a toilet and a sink which should be used for hand washing after toileting only. A pump-type soap dispenser is the desired method of dispensing soap and should be used for maximum sanitation.

Advertising

1. The onus of responsibility should be on the colon hydrotherapist to maintain an absolutely factual and true representation of the colon hydrotherapy procedure and profession in all advertising medium, whether printed page or electronic media.
2. Advertising copy which states or implies that colon hydrotherapy can treat any disease, promise cure for any disease, or that makes unsubstantiated medical claims **SHALL NOT** be used.

“Advertising medium” means: any newspaper, airwave or computer transmission, telephone directory listing other than an in-column listing consisting only of a name, address, and telephone number, business card, handbill, flyer, sign other than a building directory listing all building tenants and their room or suite numbers, or other form of written advertising.”

I-ACT Policy Statements

I-ACT recommends the use of currently registered FDA equipment and only disposable speculums, rectal tubes, or rectal nozzles. However, should the Therapist use reusable speculums, these speculums should, at a minimum, be autoclaved for sanitation and cleanliness (30 minutes). Additionally, the autoclave unit must be tested and inspected by competent authority at least four times per year- maintain documentation. (Under NO conditions should a disposable speculum or rectal tube be reused).

I-ACT recognizes the FDA classifies equipment used to instill water into the colon through a nozzle inserted into the rectum to evacuate the contents of the colon into three distinct classes; Class I (Enema Kits), Class II and Class III are (Colon Irrigation Systems). Follow the guidelines of your manufacturer, as approved by the FDA for the type of equipment (devices) you are using. Make no claims as to the use of your device other than those approved by the FDA.

The main differences between Class I and Class II devices:

- Class I devices do not have any safety features and manufacturers of Class I devices may not have any third party oversight as they do not have to comply with the good manufacturing practices that are required of Class II manufacturers.
- More specifically, the code of federal regulations CFR 876.5210 & 876.5220 describe the

differences between the Class I and the Class II devices. From that regulation, a Class I device does not include “colonic irrigation devices”. A “colon irrigation device” is a Class II device which in part is described as: “The system is designed to allow evacuation of the contents of the colon during the administration of the colonic irrigation.

- The FDA requires Class II devices to be sold on or at the order of a physician or health care practitioner. This may be different in each state.

Additionally there are two areas of concern with the use of a Class I device:

- The first area of concern is the safety of the consumers, your clients. Since the Class I device does not have to comply with good manufacturing practices there are no safeguards during the manufacturing of your equipment. The Class I manufacturer does not have to maintain records, nor are they inspected as thoroughly or as rigorously as a Class II manufacturer which also reduces the safeguard for the consumer. By definition, the Class I device is an enema kit and cannot have any safety features that might protect the consumer. Class I devices consist “of a container for fluid connected to the nozzle” and does not allow for the container to be hard plumbed to the city water system. There are no back flow prevention systems to preclude the back flow of the effluent into the tubing. Additionally, without the requirement to follow the good manufacturing practices there are no guarantees that the equipment can be cleaned, disinfected and sanitized in a manner that can guarantee there is no transmission of disease to the client. Remember, our Code of Ethics states, “the health, welfare, and comfort of our clients is our primary concern”.
- The second area of concern is the potential for inappropriate advertising. If you are using a Class I device, you may not market that as a colonic irrigation device as it clearly is an enema kit.

Although I-ACT is not aware of any laws that preclude you from assisting an individual with an enema, I-ACT does want you to consider upgrading your equipment to the equipment that provides the greatest safeguards to the public. In this profession, that would be equipment marketed as Class II devices.

Remember that I-ACT strongly recommends that all I-ACT members use FDA registered Class II devices or devices equivalent to Class II devices regulated by the appropriate agency in your country. Only individuals using FDA registered equipment will be placed on the I-ACT Web Site. Purchase equipment at your own risk. Ensure you are in compliance with your local, state, federal and country guidelines. Ensure that equipment you purchase is cleared for use in your country.

I-ACT recognizes there are two distinct types of colon irrigation systems; open and closed systems. However, it is I-ACT policy that the colon hydrotherapist / technician is always in attendance / or is immediately available to the client throughout the session. The degree of assistance is to be in compliance with the instructions of the manufacturer of the equipment as registered with the FDA, and/or as directed by a physician.

The policy on insertion is to follow the instruction of the referring physician; the guidelines of the manufacturer as approved by the FDA; or the directives from the authority of your city, county, state, or country ordinances.

I-ACT recommends that you do not put the initials (CT) for colon hydrotherapist after your name, write

it out in full. According to most state laws, putting initials after your name is not allowed unless you are licensed or have a degree from an accredited professional school.

Advertising copy which states or implies that colon hydrotherapy can treat any disease, promise cure for any disease, or that makes unsubstantiated medical claims SHALL NOT be used.

RECOMMENDED CHECK LIST
(TO BE KEPT UP TO DATE AT ALL TIMES)

1. Keep a list of all major contraindications to colon hydrotherapy from the manufacturer of your equipment readily available.
2. Keep a completed, detailed and **signed** Intake Questionnaire and a current and accurate history of all clients, being careful not to make any recommendations in print or verbal.
3. Keep the original of the doctor's prescription in your clients file.
4. Keep a checklist of equipment operation procedure which should include a record of settings used on each individual client.
5. DO NOT make any medical claims or have any literature making such claims.
6. Keep an emergency procedure checklist available in the event of any unforeseen circumstances.
7. Keep the manufacturer's operation manual in close proximity to your equipment.
8. Keep a maintenance record on your equipment and include any related repair orders.
9. Keep available the name, phone number, and address of any authorized repair company, usually the equipment manufacturer.
10. Use filtered water during session and keep a record of filter element life.
11. Use currently cleared FDA modern equipment. Have your currently cleared FDA equipment properly installed by a licensed plumber, making sure that the waste hose is correctly connected to the exiting sewer system, and ensure that it adheres to all local plumbing codes.
12. Keep your equipment clean, sanitized and in good operating condition, and never bypass or alter any safety features or any other features your manufacturer has installed without manufacturer permission.
13. Single use disposables are strongly recommended, NEVER reuse any part of the disposable kit, even if it were to be used on the same client on a return visit. IF Stainless Steel speculum are used, the speculum should be autoclaved for safety and sanitation. Additionally, the autoclave unit must be tested and inspected by competent authority at least four times per year (maintain documentation). This procedure must be in compliance with laws of your state for sterilization of stainless steel hospital equipment.

14. Always use sanitizing solution in concentrations recommended by the manufacturer.
15. Be aware that perceptions of cleanliness is of the utmost importance to members of any health department. This includes not only the appearance of your facility but your personal appearance as well.
16. Keep accurate bookkeeping and tax records.

I-ACT - Mission

The International Association for Colon Hydrotherapy (I-ACT) heightens the awareness of the colon hydrotherapy profession, ensures continuing and progressive education in the field of colon hydrotherapy and implements professionalism beyond reproach.

I-ACT - Code of Ethics

The International Association for Colon Hydrotherapy (I-ACT) membership recognizes the many and varied approaches to the age-old profession of colon hydrotherapy. Therefore, we subscribe to the following basic tenants regarding our profession and vow to uphold them to the best of our ability to achieve a common, mutual awareness within the colon hydrotherapy field:

The health, welfare, and comfort of our clients is our primary concern. We will treat our clients as we would treat ourselves.

We will obtain a good, basic education in colon hydrotherapy and will assist schools in maintaining the highest standard of education for this purpose.

We recognize the ever-changing nature of, approach to, and attitude towards health care. We will continue our education accordingly thereby keeping abreast of all new developments and advancements in this field.

We will share our knowledge and awareness with others in the colon hydrotherapy profession.

We recognize the necessity of maintaining a professional relationship with health care practitioners in other fields and of keeping pace with the latest developments in health care.

We will work as a colon hydrotherapists as our education and training allows and demands and we will not infringe upon other professions we are not qualified to practice.

We honor this profession and promise to uphold these tenets. If our work in colon hydrotherapy does not uphold this standard of professionalism, we will leave the profession to those who can.

I-ACT Zero Tolerance Policy

Background: The International Association for Colon Hydrotherapy (I-ACT) recognizes the seriousness and extent of injury that any form of abuse may cause another and therefore supports Zero Tolerance of such abuse in any form: this includes any type of harassment, verbal, physical, emotional, financial or sexual, by an I-ACT member colon hydrotherapist.

I-ACT endeavors to provide protection of the public interest by addressing client-member, member-student and member-member abuse openly. I-ACT strives to provide an accessible and sensitive reporting process, and establishes deterrents through the administration of a disciplinary process reflecting the serious nature of the violation.

This policy has been created to advise our membership that I-ACT endorses the Principle of Zero Tolerance for abuse in any form and to ensure members understand that abuse in any form is unacceptable and will not be tolerated.

In defining abuse, it is important for the professional to be cognizant of the imbalance of power that exists in the professional colon hydrotherapy environment. Clients often seek professional services when they are vulnerable or in a state of pain. A member of this profession has the 'power' by virtue of their authority, knowledge, access to privileged information and the influence they potentially hold over the client, to exploit. It is expected, therefore, that the professional will address the client's needs in a sensitive and caring manner in accordance with the Standards of Practice and the Code of Ethics for the profession.

I-ACT is also aware that the most productive and satisfying environment is one in which instruction and growth is accomplished in a spirit of mutual trust and respect. Harassment is a form of discrimination that is offensive, impairs morale, undermines the integrity of Client/Member and Instructor/Student Member relationships and may cause serious harm to the productivity, efficiency and stability of our organization and industry.

I-ACT members will maintain confidentiality of client information, unless given written permission by the client or ordered by the courts. I-ACT members will clearly represent their educational qualifications and inform clients of the limits of their license or certification. I-ACT members should refer clients to an appropriate professional for services if the treatment is not within their scope of practice. I-ACT members will use precautions to do no harm to physical, mental and emotional health of clients and associates.

Abuse can be defined as:

Harassment

Harassment on the basis of a person's gender, race, color, ancestry, ethnic or national origin, age, disability, arrest or conviction record, marital status, sexual preference, military or organizational membership will not be tolerated. Every individual has the right to receive colon hydrotherapy services, education and training in an environment which is free from discrimination, intimidation, and all forms of harassment.

Verbal - Non Verbal

Verbal abuse may include but is not limited to, derogatory comments, sarcastic, demeaning or seductive remarks. It is also important to note that the tone of verbal communications may characterize how words are perceived. I-ACT members must be aware that a person's age; culture, socio-economic status and other particular sensitivities may affect how a client perceives communications with an I-ACT member.

Jokes, insults and innuendoes (based on race, sex, age, disability, etc.), and degrading sexual remarks, such

as referring to someone as a stud, hunk or babe; whistling; cat calls; comments on a person's body or sex life, and/or pressures for sexual favors are examples of verbal abuse that is completely unacceptable.

Non-Verbal behaviors that are unacceptable could be gestures, staring, touching, hugging, patting, blocking a person's movement, standing too close, brushing against a person's body, any unsolicited touch or display of sexually suggestive or degrading pictures, racist or other derogatory cartoons, drawings or communications.

Physical

Using unnecessary force in the course of providing treatment or training.

All therapist members will have an understanding regarding the Ethics of Touch.

All therapist members should follow the guidelines of the manufacturer for equipment use.

All therapist members will be aware of the I-ACT policy on insertion.

Emotional

Where a member of the profession uses the position of power to intimidate or show insensitivity toward the client or a student. Emotional abuse demeans the client or student in such a way as to lower their sense of personal worth.

Financial

The inappropriate use of a client's or student's funds, property or resources. May include such behaviors as:

- a. Attempting to, or actually persuading, deceiving, or threatening the client to part with their funds, property or possessions;
- b. Recommending excessive treatments/trainings with no **clinical indication requiring the same;
- c. Use of a client's or student's money for purposes other than that intended by the client;
- d. Failure to provide the client or student a written refund policy and
- e. Failure to provide a refund for services if requested by client.

Sexual

I-ACT defines sexual abuse to include:

- a. Sexual intercourse or other forms of physical sexual relations between the member and the client or student;
- b. Touching of a sexual nature, of the client or the student by a member;
- c. Behavior or remarks of a sexual nature by the member towards the client; Exception: "sexual nature" does not include touching, behavior or remarks of a clinical nature appropriate to the service provided.
- d. Touch should be therapeutic in nature providing a necessary action related to the treatment for a desired result.

Policy:

I-ACT will investigate and act upon any complaints and information received dealing with allegations of abuse of a client in an effective, timely and sensitive manner.

In relation to those members found in violation of the Zero Tolerance Policy, I-ACT will uphold the sanctions mandated by the I-ACT Grievance Committee as approved by the Board. I-ACT is committed to imposing appropriate penalties to reflect the severity of the conduct of concern.

Foundation Level Syllabus

for use by

I-ACT Recognized Schools

and/or

I-ACT Recognized Instructors

(For use in preparing daily Lesson Plans)

Foundation Level Syllabus

June 17, 2008

modified November 7, 2008

Prerequisites for Entry into Training & for Certification

1. Each student **MUST** have a High School Diploma or equivalent requirement showing they have achieved High School Standards. This may be documented by Diploma, GED or equivalency exam such as the Wunderlich Ability to Benefit Test.
 - This must be completed prior to entering into training.
2. I-ACT recommends that each new student receive 1-3 colonics prior to entering training. This recommendation can be waived if the student has contraindications to receiving colonics.
3. Each student **MUST** show proof that they have taken a CPR Class and have a current CPR card.
 - This **MUST** be completed prior to certification; however, It is strongly recommended this be accomplished before entering training.
 - The Instructor/School must document completion of this requirement on the official I-ACT transcript.
4. Each student **MUST** have completed a post Secondary (or higher) Anatomy & Physiology (A&P) Course of at least 3 Credit Hours (30 class room hours) from a licensed institution or from an institution or course on the I-ACT recognized list posted on the I-ACT website (www.i-act.org).
 - This **MUST** be completed prior to certification; however, It is strongly recommended this be accomplished before entering training.
 - The Instructor/School must document completion of this requirement on the official I-ACT transcript.
5. Each student **MUST** be an I-ACT member prior to taking any I-ACT exam. The school or instructor can collect the application - with payment - and hold this until training is completed to submit with the entire package.

Requirements for Schools or Instructors

1. Each school / instructor will only train the students using FDA registered equipment, or equipment registered with appropriate agency in the country in which the instructor / school resides.
 - a. This training must follow the guidelines of the equipment as published by the manufacturer.
 - b. All internship must be supervised by an Instructor, and be consistent with I-ACT Policy.
2. Each school / instructor will have a contract outlining the enrollment agreement and refund policies of the school / instructor. Each student will receive a copy of this document.
3. Each school / instructor will provide the student with a certificate of completion for the classroom hours taught in the course.
4. The school / instructor will also notify I-ACT of each student that completes their training. This documentation will be done through the I-ACT transcript and mailed to the I-ACT office within 14 calendar days.
5. The school / instructor will maintain student records (attendance, quiz scores, etc.) for an indefinite period of time.
6. Each school / instructor will use the I-ACT approved Anatomy & Physiology (A&P) pretest to ensure that the student has the appropriate level of A&P knowledge to allow the student to have the opportunity to succeed in the training.

OFFICIAL I-ACT TRANSCRIPT

SCHOOL / INSTRUCTOR: _____

STUDENT: _____

ADDRESS: _____ STUDENT S.S.# _____

CITY: _____ STATE _____ ZIP _____ BIRTH: _____

PHONE:(_____) _____ E-Mail Address _____

Transfer Credit _____ Source: _____ DATE: _____

Prerequisite Verification

High School Diploma or Equivalent ----- Verified by _____ Date _____

1-3 "Recommended" Colonics ----- Verified by _____ Date _____

Post Secondary A&P ----- Verified by _____ Date _____

CPR ----- Verified by _____ Date _____

FOUNDATION LEVEL

COURSE DESCRIPTION:	HOURS	GRADE:	COURSE DATES:
Business Ethics / Office Procedures (5 hrs) ---	_____	-----	_____
Health & Sanitation (5 hrs)-----	_____	-----	_____
Anatomy & Physiology (45 hrs)-----	_____	-----	_____
Colon Hydrotherapy			
- Theory/History/Practice (10 hrs)-----	_____	-----	_____
Complementary Modalities (5 hrs)-----	_____	-----	_____
Internship / Apprenticeship (29.75 hrs)-----	_____	-----	_____
15 minute Presentation (0.25 hrs) -----	_____	-----	_____

HOURS COMPLETED: _____ FINAL GRADE: _____ DATE: _____

Signature – I-ACT Instructor / I-ACT School Director _____ Date _____

I certify the above course hours have been completed, and this individual is ready for certification. **Additionally, I will maintain documentation on this individual at my clinic/school indefinitely.** This material will be made available during any I-ACT school/facility inspection.

Send This Transcript to I-ACT
 P.O. Box 461285
 San Antonio, TX 78246-1285
 210-366-2888

Checklist for Submitting Information to I-ACT

Prerequisites have been met

- They have received in writing, briefed and understand the policies of the school or instructor with regard to:
 - I-ACT Policies and Procedures
 - school termination policies
 - refund policies
 - graduation requirements
- they have high school diploma or equivalent
- they have postsecondary education level A&P course or understand it must be completed before certification
- they have CPR card or understand it must be completed before certification
- they have received 1 - 3 colonics prior to entering training (recommended)
if not, why? _____

Application

- is it complete
- is it signed in the appropriate places
- is passport photo attached
- are the correct membership fees included
 - cash
 - check (is check for correct amount and signed)
 - Credit Card (are there sufficient numbers does it include expiration date and security code)
- is the sponsor information on application
- is the document readable

Transcript

- is it filled out correctly
- is it signed by instructor or school director
- Instructors must send membership application and fees, exams and fees, and transcript to I-ACT, within 14 days of taking the I-ACT exam

Level 1 Exam

- is the Test version circled
- are the correct exam fees attached
 - cash
 - check (is check for correct amount and signed)
 - credit card (are there sufficient numbers does it include expiration date and security code)

Student is aware of additional criteria for completing certification

- copy of liability insurance (or statement saying they do not wish to carry it)
- pictures of their facility (at a minimum - waiting room, bathroom, and colonic room)
- blank copy of intake form

**This Syllabus is to be used as a guide
for the I-ACT Recognized Instructor or School**

Foundation Level 100 hour course

The School or Instructor is authorized to modify this guide as required to be in compliance with the guidelines of your state or your state licensing agency.

It is the responsibility of the Instructor or School to ensure that the Student is adequately trained and prepared for a profession in colon hydrotherapy.

The I-ACT Foundation Level test questions will be structured after these lesson plans.

It is the responsibility of each I-ACT School or I-ACT Instructor to verify that the appropriate I-ACT testing fee has been paid to I-ACT or collected by the School or Instructor. These fees may be submitted to I-ACT when the I-ACT Level 1 test is returned for grading by I-ACT.

In order for the student to complete their Level 1 (Foundation Level) requirements, they must attend an I-ACT Recognized School or Instructor teaching the 100 hour course.

**••• See the I-ACT Guidelines for complete
Foundation Level certification requirements •••**

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Business Ethics/Office Procedures

Unit 101.1 - Introduction of Class

1. Welcoming and Introduction of Each Class Member

Student objectives:

1. Student will meet each member of the class.
2. Student will introduce self to each member of class.

2. School policies

Student objectives:

1. Student will understand the policies of the School in regard to:
 - Cancellation & Refunds
 - Class Schedule
 - Attendance
 - Satisfactory Progress
 - Handling Grievances
 - Student Conduct
 - Tardys
 - Testing (Test on Time)
 - Job Placement
 - Previous Education & Training
 - Graduation Requirements
 - Miscellaneous Policies

3. I-ACT Policies

Student objectives:

1. Student will understand the policies of I-ACT

3. Course perspective

Student objectives:

1. Student will begin to understand the relationship and value of colon hydrotherapy

Business Ethics/Office Procedures

Unit 101.2 -- *Regulations, Permits, Registration, Licenses, Approvals and Contracts*

1. Federal Law

- a. Classifications of colon hydrotherapy equipment
- b. Federal guideline

Student objectives:

- 1. Students will be able to explain the classifications of colon hydrotherapy equipment and enema kits

2. State Law

- a. Historic overview
- b. Governing Body
- c. Advisory Council
- d. Registration of therapists
 - (1) Requirements
 - (2) Application process
 - (3) Exams
 - (4) Violations and penalties
 - a. Unprofessional conduct
 - b. Other
- e. Scope of practice
 - (1) Treatment
 - (2) Diagnosis
 - (3) Prescription
- f. Fees and registration
- g. Benefits of law
 - (1) Recognition as health care
 - (2) Supersedes city ordinances (except for zoning)
- h. Reasons for law
- i. Comparison of states
- j. Changing legislation

Student objectives:

- 1. Students will be able to explain why the colon hydrotherapist must be aware of the laws, rules, and regulations governing the practice of colon hydrotherapy.
- 2. Student will be able to explain why it is necessary in some states to obtain registration before beginning a professional practice.
- 3. Student will be able to differentiate treatment which is allowable under scope and diagnosis and prescription which are not allowable and are in direct violation of the applicable medical practices act.

3. City / County Ordinances

- a. General Business
 - (1) Registering the name of the company
 - a. Assumed name
 - b. Corporate name
 - (2) Business operating license
- b. Facility
 - (1) Zoning
 - (2) Fire Inspection
 - (3) Certificate of Occupancy
 - (4) Building Codes
 - (5) Construction Permits
 - (6) Bonds
 - (7) Signage

Student objectives:

- 1. Students will be able to explain why all local rules, regulations and ordinances must be met.
- 2. Students will know where to obtain more indepth information regarding establishing a new business.

Business Ethics/Office Procedures

Unit 101.2 -- Regulations, Permits, Registration, Licenses, Approvals and Contracts (continued)

3. Legal Business Structure

- a. Sole Proprietorship
- b. General Partnership
- c. Limited Partnership
- d. Corporation

Student objectives:

1. Students will explain what type of business organization will best suit his/her expectations for his/her colon hydrotherapy practice.

4. Taxes

- a. Types of taxes
 - (1) Income
 - (2) Sales and Use Tax
 - (3) Withholding
 - (a) Employer vs employee
 - (b) Employee Tax I.D. #
 - (4) Corporate Franchise Tax
 - (5) Property Tax
- b. Tax practitioners
 - (1) Tax Lawyer
 - (2) Accountant - CPA
 - (3) Tax practitioner
 - (4) Tax accountant
- c. Federal Income Tax Laws
 - (1) Who must file
 - (a) Individuals
 - (b) Businesses
 - (2) Income Source
 - (a) Colon Hydrotherapy
 - (b) Retail
 - (c) Modalities
 - (d) Instructor fees
 - (e) Supplementary
 - (f) Other
 - (3) Deductions
 - (a) Advertising
 - (b) Association Dues and publications
 - (c) Bad debts
 - (d) Bank service charges
 - (e) Business Education
 - (f) Car and Truck expenses
 - (g) Depreciation
 - (h) Insurance
 - (i) Interest
 - (j) Laundry and cleaning
 - (k) Legal & professional services
 - (l) Offices expenses
 - (m) Registration fees

Student objectives:

1. Students will be able to list the basic legal business structures and tax obligations.
2. Student will be able to determine which state regulations pertain to their practice of colon hydrotherapy.
 1. Student will be able to determine which tax practitioner to choose and why.
1. Students will be able to determine which business category they want to be classified as.
 2. Student will be able to determine which deductions are applicable to their practice of colon hydrotherapy.
 3. Student will be able to explain what documents will support their deduction claims according to IRS rules and regulations.
 4. Students will be able to determine which forms and schedules they will need in order to fulfill federal tax law requirements in filing their tax returns.

Business Ethics/Office Procedures

Unit 101.2 -- *Regulations, Permits, Registration, Licenses, Approvals and Contracts (continued)*

- c. Federal Income Tax Laws
 - (3) Deductions (continued)
 - (n) Rent, Lease, Mortgage
 - (o) Repairs
 - (p) Supplies
 - (q) Taxes
 - (r) Travel, meals & entertainment
 - (s) Utilities & Telephone
 - (t) Wages
 - (u) Other expenses
 - (2) Tax Forms and Schedule 1
 - (a) Business classification
 - (b) Examples / explanations
 - (1) Form 1040
schedule A,B &C
 - (2) etc.

5. I-ACT Standard Operating Procedures, Regulations and Guidelines

Student objectives:

1. Student will be able to outline the policies, procedures, and guidelines of I-ACT.

6. Other Regulations / Guidelines

Student objectives:

- a. Labor regulations
- b. Leases
- c. Contracts
- d. Professional ethics, etiquette
- e. Professional Standards
- f. Safety
- g. Communicable Disease
- h. OSHA
- i. HIPPA

1. Students will be able to explain in depth examples of professional behavior, ethics and standards as applied to the practice of colon hydrotherapy.
2. Student will understand the need to be compliant with OSHA and HIPPA regulations that are applicable to their state and to the requirements of their referring physician requirements.

7. Insurance Types

Student objectives:

- a. Liability (premises)
- b. Professional Liability (malpractice)
- c. Disability
- d. Health / Life
- e. Errors & Omissions /Workman's Compensation
- f. Fire, theft, vandalism

1. Students will understand the different types of insurance and the application of each type.

Business Ethics/Office Procedures

Unit 101.3 -- Career Path Selection, Employment Acquisition

1. Personal Survey

- a. Past experience
- b. Interests, Goals
- c. Educational background
- d. Options available
- e. Leader vs Follower
- f. Employer vs employee mentality

2. Business Structure/Relationships

- a. Apprenticeship
- b. Freelance
- c. Employee, employer
- d. Independent contractor
 - (1) Lease space
 - (2) On call
 - (3) Percentage split
- e. Partnership
 - (1) Group practice
 - (2) Cooperative
 - (3) Silent Partner
 - (4) With an existing business
- f. Collective
- g. Comparison

3. Service Sites

- a. Clinical practice
- b. Home practice
 - (1) Client's home
 - (2) Therapist's home
- c. Salons / Reducing salons
- d. Spas, resorts
- e. Fitness centers, health clubs
- f. MD office (medical)
- g. ND office (naturopathic)
- h. DO office (osteopathic)
- i. DC office (chiropractic)

Student Objectives:

1. Students will evaluate personal goals, experience, interests and abilities to assist in making good decisions regarding their career direction.

2. Students will be able to explain what some of the advantages/disadvantages are of being self employed.

1. Students will be able to describe the various business structure/relationships available in the market place.

1. Students will survey the various service sites open to him/her.

Business Ethics/Office Procedures

Unit 101.3 -- Career Path Selection, Employment Acquisition (continued)

4. Finding Job Leads

- a. Motivation / determination
- b. Start before graduation
- c. School placement services
- d. Realistic time to build a practice
- e. Systematic job hunting guidelines
 - (1) letters of introduction
 - (2) resumes / references
 - (3) letters of recommendation
 - (4) survey of personal contacts

Student Objectives:

1. Students will write a plan of action and begin their job hunting or business establishment process before graduation.

5. Business Plan - Overview

- a. Definition
- b. Topics Covered
 - (1) Summary
 - (2) Table of Contents
 - (3) Background and history
 - (4) Description of service
 - (5) Market
- c. Competition
- d. Ownership and Management
 - (1) Who is it?
 - (2) Resume

1. Students will be able to explain what a business plan is and its importance relative to their colon hydrotherapy practice.

2. Students will be able to locate sources which will assist them in developing and writing their resume.

3. Students will be able to determine what business aspects they lack in order to know where to look for additional assistance.

4. Students will be able to explain in general the different parts of a business plan.

6. Promotion

- a. I-ACT policy on advertising
 - (1) Advertising Strategy
- b. Methods Advertising
 - (1) Large groups
 - (2) Media Choices
 - (a) Radio
 - (b) Television
 - (c) Signs
 - (d) Word of mouth
 - (e) Print
 - Business cards
 - Brochures
 - Classified ads

Students will be able to explain the policies of I-ACT with regard to advertising.

1. Students will be able to explain several promotional options available to them.

Business Ethics/Office Procedures

Unit 101.4 -- *Management / Operations*

1. Office Procedures

- a. Definite hours of operation
- b. Appointment booking systems
- c. Scheduling guidelines
- d. Record keeping
 - (1) Client intake forms
 - (a) Contraindications
 - (b) Mailing list information
 - (c) Client need,
 - (2) Client progress and treatment record
 - (3) Bookkeeping and accounting
 - (a) Income
 - (b) Expenses
 - (c) Assets
 - (d) Financial
 - (e) Cash flow statements
 - (f) Taxes collected, paid, due
 - (g) Where to get assistance
 - (4) Types of bookkeeping
 - (a) Single entry
 - (b) Double entry
- e. Policies established
 - (1) Cancellations
 - (2) No shows, late
 - (3) Proper draping
 - (4) No dating clients
 - (5) Not working when ill (sick days)
 - (6) Dress code
 - (7) Professional confidentiality
 - (8) Hygienic standards
 - (9) Professional Ethics and etiquette
 - (10) Personal Days
- f. Telephone practices
 - (1) Telephone traffic sheets
 - (2) Providing information
 - (3) Gathering information
 - (4) Screening clients
 - (5) Portraying a professional image
 - (6) Phone sales techniques

Student Objectives:

- 1. Students will be able to demonstrate how to systematically record appointments.
- 2. Students will understand the importance of record keeping.
- 3. Students will know the basic records required for tax and business planning purposes.
- 4. Students will establish clear policies for their practices.
- 5. Students will be able to conduct an effective client phone conversation with ease.
- 6. Students will explain the difference between single and double entry systems.
- 7. Student will determine which bookkeeping system would best fit their practice of colon hydrotherapy.

Business Ethics/Office Procedures

Unit 101.4 -- *Management / Operations*

(continued)

2. Client Comfort

- a. Water, other fluids
- b. Temperature
- c. Air movements
- d. Reception area
- e. Customer information
- f. Restrooms
- g. Props, pillows
- h. Blankets, turbans
- i. Toiletries
- j. Music
- k. Dressing and undressing

Student Objectives:

1. Students will be prepared to provide the basic client comfort.

3. Cash Management

- a. Budgeting
- b. Separate bank account for business
- c. Establishing credit
- d. Merchant credit card accounts
- e. Business savings
- f. Pricing for services
- g. Discounting services
- h. Trading
- i. Projections
- j. Cash flow
- k. Petty cash
- l. Financial statements
- m. Journals for income and expenses
- n. Relationship with banking institution
- o. Cost of operation
- p. Fluctuation in business
- q. Varied forms of payment
- r. Expense reduction
- s. Supplementary income sources
 - (1) Hydrotherapy treatments
 - (2) Product Sales
 - (3) Modalities
- t. Effect of disability

1. Students will be prepared for the reality of handling the income and expense portion of the business.

2. Students will be prepared to plan effectively for financial management of their practices.

3. Students will be able to explain the need for and how to create or acquire journals for their business.

Business Ethics/Office Procedures

Unit 101.4 -- *Management / Operations*

(continued)

5. Sources of Income

- a. Bank Loans
- b. Small Business Administration (SBA) Loans
 - (1) Qualifications
 - (2) Procedure
 - (3) Different types
- c. Venture Capital
 - (1) Definition
 - (2) Where to obtain
- d. Grants
 - (1) Where to obtain
 - (a) U.S. Government
 - (b) Foreign governments
 - (c) Companies
 - (d) Individuals

Student Objectives:

1. Student will be able to explain what types of financing are available and what differences there are.
2. Student will be able to determine where to go to start the process of acquiring a loan or other financial arrangement for their colon hydrotherapy practice.

6. Professional Affiliation

- a. Benefits of
- b. Necessity for
- c. Choosing one / more
- d. Activity level
- e. Effect on image

1. Students will be able to explain the importance of membership with a professional organization.

7. Professional Code of Behavior

- a. Hygiene
- b. Client Interaction
- c. Personal presentation
- d. Omission of sexual services
- e. Draping, gowns
- f. Professional confidentiality
- g. Honesty, integrity
- h. Referring out
- i. Client ownership
- j. Deliver what you charge for
- k. Loyalty
- l. Continuing education
- m. Commitment to personal growth

1. Students will be able to explain the importance of having a professional code of behavior.

8. Location

- a. Layout
- b. Maintenance / housekeeping
- c. Safety
- d. Security
- e. Systems for energy conservation

1. Students will be able to explain the necessary elements of a colon hydrotherapy facility.

Business Ethics/Office Procedures

Unit 101.4 -- *Management / Operations*

(continued)

9. Business math

- a. Figuring sales tax
- b. Comparison of volume purchase of supplies (4oz size vs. gal size pricing)
- c. Maximize income as a therapist
- d. Comparison of net income
 - (1) Private practice with overhead
 - (2) Private practice with no overhead
 - (3) Employee
 - (4) Contractor
 - (5) Income protection

Student Objectives:

1. Students will be able to perform basic math computations regarding their practice.
2. Students will be able to dilute solutions of sanitation fluids according to manufacturer guidelines.

10. Valuable Forms

- a. Contraindications
- b. Phone traffic sheets
- c. Income records
- d. Client intake
- e. Gift certificate sales record
- f. Day sheets / Income

11. Communication Systems

- a. Answering machine
- b. Pagers
- c. Answering services
- d. Voice mail
- e. Educate receptionists

1. Students will survey the basic telephone communications systems necessary to their business development.

12. Professional Referral List

- a. Doctors
- b. Colon therapists
- c. Nutritional counselors
- d. Psychotherapists, Psychologists
- e. Other

1. Students will understand the importance of referring clients out to the appropriate professionals.
2. Students will begin to create a list of professionals.

13. Personality and Human Relations

- a. Client interviewing / Visual impressions
- b. Screening clients over the phone
- c. Handling difficult clients
 - (1) the sexually aroused/interested
 - (2) the elderly
 - (3) those in pain
- d. Protecting client modesty
- e. Listening skills

1. Students will be able to interview clients with ease.
2. Students will be able to handle difficult clients.
3. Students will learn to listen and observe their clients to provide good service.

Health & Sanitation

Unit 102.1 -- *Disease & Infection*

(Appx1 Hours)

1. Bacteria

- a. Specific types
- b. How spread
- c. Prevention of contamination

Student objectives:

1. Student will be able to identify specific types of bacteria, how bacteria is spread and the precautions that need to be taken to prevent further contamination.
2. Student will explain the importance of cleanliness of person, and of surroundings as protection against the spread of disease.

2. Virus

- a. Specific types
- b. How spread
- c. Prevention of contamination
- d. AIDS virus symptoms

Student objectives:

1. Student will be able to identify specific types of virus, how virus is spread and the precautions that need to be taken to prevent further contamination
1. Student will know the typical symptoms of AIDS and ARC.
2. Student will recognize common myths and misconceptions about the transmission of AIDS.
3. Student will explain the special considerations taken when working with an AIDS or ARC patient.

Health & Sanitation

Unit 102.2 -- *Sanitizing*

(Appx 1 Hours)

1. Sanitary Conditions

- a. Equipment
 - (1) Moist Heat
 - (2) Dry Heat
 - (3) Ultraviolet-ray
electrical sanitizers
 - (4) Disposables

- b. Disinfectants
 - (1) Ethyl or Grain Alcohol
 - (2) Ammonium Compounds
 - (3) Lysol
 - (4) Germtrol
 - (5) Bleach
 - (6) Formalin
 - (7) Chemical Disinfectant (CDC)

Student objectives:

- 1. Student will explain the need for laws that enforce the strict practice of sanitation.

- 2. Student will sanitize and sterilize implements and other items used in colon hydrotherapy procedures.

2. Housekeeping

- a. Floors
- b. Tables
- c. Linens
- d. Flat Surfaces
- e. Wash room
- f. Closed Trash Containers
- g. Dust
- h. Ventilation
- i. Other Surfaces

Student objectives:

- 1. Student will explain how various disinfectants, antiseptics, and other products are used most effectively.

3. Time Tables

Student objectives:

- 1. Student will develop a regular time plan for housekeeping duties, laundry, etc.

Health & Sanitation

Unit 102.3 -- *Personal Hygiene*

(Appx .5 Hours)

1. Cleanliness

- a. Personal
- b. Clothing
- c. Jewelry
- d. Hair
- e. Nails
- f. Gums

Student objectives:

- 1. Student will maintain a clean professional demeanor.

2. Handwashing

- a. Before each session
- b. After each session
- c. Nail Brush

Student objectives:

- 1. Student will practice all sanitary rules.

3. Clothing

- a. Loose fitting
- b. Appropriate to profession
- c. Natural Fibers

Student objectives:

- 1. Student will choose appropriate clothing.

4. Personal Health Care

- a. Have a physical check-up
- b. Maintain a normal weight
- c. See dentist regularly
- d. Get appropriate rest
- e. Get proper exercise
- f. Have body work
- g. Allow for relaxation time
- h. Maintain good working posture
- i. Follow well-balanced nutritional diet

Student objectives:

- 1. Student will maintain appropriate hygiene and health practices.

3. Positive Attitude

- a. Mental health checklist
- b. Use Professional assistance

Student objectives:

- 1. Student will maintain a positive mental outlook, and will seek professional assistance when needed.

Anatomy & Physiology

Unit 103.1 -- Review General Anatomy & Physiology

(Appx 5 hours)

1. Terms and organization of the Body

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of cells, and tissues.

2. Skeletal System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the skeletal system.

3. Muscular system

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the muscular system.
2. Identify muscles of abdominal region and the types of peristaltic action.

4. Nervous System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the nervous system.
2. Identify nerves that affect the alimentary tract.
3. Identify the peripheral and autonomic nervous system.

5. Cardiovascular System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the cardiovascular system.
2. Identify arteries and veins that support the alimentary tract.

Anatomy & Physiology

Unit 103.1 -- *Review General Anatomy & Physiology Cont.*

6. Lymphatic System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the lymphatic system.

7. Endocrine System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the endocrine system.
2. Identify endocrine glands and the hormones they secrete as they apply to the alimentary tract.

8. Respiratory System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the respiratory system.

9. Urinary System

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the urinary system.

10. Reproductive System and Special Senses

Student objectives:

1. Student will demonstrate knowledge and familiarity with terms relating to, and function of, the reproductive system.

Anatomy & Physiology

Unit 103.2 -- *Digestive System*

(Appx 40 hours)

Student objectives:

1. Introduction to the digestive system

1. Name and describe the location of the organs of the digestive system and their major parts.

2. Structure and function of the digestive system

2. Describe in detail the functions of each part of the digestive system and the accessory organs that supports the alimentary tract.

- a. Mouth - chews food and mixes it with saliva
- b. Pharynx /Esophagus
- c. Stomach (4 parts)
- d. Small intestine- (3 parts)
- e. Liver
- f. Pancreas
- g. Spleen
- h. Gall bladder
- i. Large intestine (colon)

3. Metabolism

- a. Carbohydrates
- b. Lipids
- c. Proteins
- d. Vitamins
- e. Minerals
- f. Enzymes

1. Describe how carbohydrates are utilized by the cells.

2. Describe how lipids are utilized by cells.

3. Describe how amino acids are utilized by cells.

4. Distinguish between a vitamin and a mineral.

5. Distinguish types of digestive enzymes and their function.

Anatomy & Physiology

Unit 103.2 -- *Digestive System, Continued*

4. Nervous system effects on the digestive system

Student objectives:

1. Name and describe the nervous system and its impact on the alimentary tract.

5. Endocrine and exocrine glands and their effects on the alimentary tract

Student objectives:

1. Name and describe the endocrine glands (and the hormones they secrete) and exocrine glands and their impact on the alimentary tract.
2. Describe in detail the functions of each gland and the impact on the digestive system.

6. Cardiovascular system interaction with the digestive system

Student objectives:

1. Name and describe the venous and arterial system and their impact on the alimentary tract.
2. Describe in detail the cardiovascular support for each portion of the alimentary tract.

History / Theory / Practice

Unit 104.1 -- *History*

(Appx 10 Hours)

1. History of colon hydrotherapy

Student objectives:

1. Student will understand the history of colon hydrotherapy from 1500 B.C. thru the present.
2. Student will understand the reason for the ebbs and flows of colon hydrotherapy with reference to the history.

History / Theory / Practice

Unit 104.2 -- *Theory*

1. Theory

1. Student will be aware of the value of colonics.
2. Student will understand the difference between a colonic and an enema.

History / Theory / Practice

Unit 104.3 -- *Types of Equipment*

1. Equipment types

1. Student will be aware of the differences of the Closed and Open system.
2. Student will understand I-ACT's policy on the choice of equipment.

History / Theory / Practice

Unit 104.4 -- *Indications / Contraindications*

1. Indications / Contraindications

1. Student will be able to recognize indications and contraindications for colon hydrotherapy.
2. Student will explain why contraindications & indications must come from the manufacturer of their equipment.

2. Interaction with prescription drugs

1. Student will be able to identify prescription drugs that may weaken or thin the colon wall and be contraindicated for colon hydrotherapy.

Complementary Modalities

Unit 105.1 -- *Alternative Therapies*

(Appx 5 Hours)

1. Complementary Modalities / Alternative Therapies

Student objectives:

1. Student will learn about complementary modalities such as massage, myofacial release, reflexology, neuro-linguistic health, diet, nutrition, energy work, breath work, chakras, etc., as deemed appropriate by the school and or instructor.
2. This section is designed to allow the individual school or instructor to tailor this area of instruction to their own personality and interests.

Internship/Apprenticeship

Unit 106.1 -- *Intern/apprenticeship*

(Appx 29 3/4 Hours)

1. Internship/Apprenticeship

Student objectives:

1. Student will intern on a minimum of 25 separate clients.
2. Student will perform all functions of the colon hydrotherapy process including, but not limited to:
 - scheduling appointments
 - confirming appointments
 - performing client intake
 - equipment setup
 - performing colonic sessions
 - post-colonic client care
 - cleaning colonic equipment
 - routine facility cleanliness
3. Student will be able to complete all documentation and charting from the colonic.
4. Student will be able to identify indications/contraindications.
5. Student will be able to recognize clients that are in need of medical intervention and be familiar with proper procedures to refer for appropriate medical assistance.

Sample •• Client Intake / Student Evaluation Form •• Sample (for use with the Internship)

CLIENT INTAKE FORM - BEFORE SESSION

date _____

Client Name _____

Student Therapist Name _____

What motivated you to come for Colon Hydrotherapy?

Any expectations you may have as a result of receiving Colon Hydrotherapy?

How many bowels movements per day?

Are you constipated?

Stress or anxiety?

Average hours of sleep per night?

Do you exercise?

What does your diet consist of?

Food Allergies?

Prior and present Health Conditions?

Prior and present medications?

Prior and present supplements?

Prior or recent hospitalizations?

Prior or recent surgeries?

Do you still have your appendix, gallbladder, and tonsils?

Are you allergic to latex or petroleum products?

.....

STUDENT THERAPIST EVALUATION to be filled in by the CLIENT after the SESSION

How did your Therapist greet you? Smile____ Nervous____ Impatiently____ Knowledgeably____
Other_____

Were you made to feel relaxed and comfortable? Yes____ No____

Did your Therapist inquire to your overall health as per your responses on the Intake Form? Yes____ No____

Were you instructed on how to prepare for your session (i.e. remove clothing, release bladder, draping), getting on the table and insertion of speculum or rectal tube? Yes____ No____

Did your therapist explain the procedure to you today? Yes____ No____

Were you kept properly draped (covered) and made comfortable during your session? Yes____ No____ Not sure____

Was inserting the speculum or rectal tube a comfortable procedure? Yes____ No____ Not sure____

Was the equipment, session room and restroom clean? Yes____ No____ Not sure____

Was your session results satisfactory? Yes____ No____ Not sure____

Will you recommend Colon Hydrotherapy to your family/Friends? Yes____ No____ Not sure____

Do you have any additional comments for your therapist or how you feel after your session:

Thank you for taking time to fill out this evaluation.

Client Name _____

Therapist _____

15 Min Presentation

Unit 107.1 -- 15 Minute Presentation

(Appx 1/4 Hour)

1. 15 minute Presentation on Digestive Tract

Student objectives:

1. Student will present to the class/instructor a 15 minute presentation on the digestive tract demonstrating their understanding and knowledge of the digestive system so that they will communicate relevant knowledge to a client effectively.

15 Minute Evaluation Form - For Level 1

Individual Being Evaluated _____ Presentation Date _____

Location _____

Evaluator's Name _____ Date: _____ Score: _____

Please elaborate on your judgements and opinions in detail whenever possible (10 points each - if applicable):

- 1) Start / stop on time?
- 2) Did Lecturer introduce themselves?
- 3) What did you learn from this presentation?
- 4) Was it stimulating?
- 5) Did the speaker appear groomed?
- 6) Personality / attitude / smile?
- 7) Was the speech interesting, did it capture audience and keep their attention?
- 8) Communicate to audience / eye contact / relate to audience?
- 9) Speak clearly / formulate well?
- 10) Seem to be knowledgeable / is prepared?

Comments:

I Recommend (circle one): Pass Fail

Evaluator Signature: _____ (please return to I-ACT home office)

Write on back if necessary.

- 8 Hour Class -
Information on the 8 hour Class
for individuals not taking the 100 hour course

For individuals that do not take a recognized I-ACT 100 hour course, they are required to travel to an I-ACT recognized School or instructor (that has no relationship to the member) and provide the documentation for:

- 100 colon hydrotherapy sessions in the preceding year.
- They must show proof of High School Diploma or equivalency exam such as the Wunderlich Ability Test.

They must attend an I-ACT approved 8 hour class that includes:

- They must take an I-ACT policy & procedure exam (the I-ACT Level 1 Exam).
- They must be familiar with contraindications specific to the type of FDA registered equipment being used.
- They must give 3 colonics. (recommend that one be given to the instructor)
- They must give a 15 minute presentation on how to talk to a new client on the digestive tract demonstrating their understanding and knowledge of the digestive system so that they will communicate relevant knowledge to a client effectively.
- Each student **MUST** show proof that they have taken a CPR class and have a current CPR card.
 - This **MUST** be completed prior to certification; however, it is strongly recommended this be accomplished before taking the 8 hour course.
 - The Instructor/School must document completion of this requirement on the official I-ACT transcript.
- Each student **MUST** have completed a post Secondary (or higher) Anatomy & Physiology (A&P) Course of at least 3 Credit Hours (30 class room hours) from a licensed institution or from an institution or course on the I-ACT recognized list posted on the I-ACT website (www.i-act.org).
 - This **MUST** be completed prior to certification; however, it is strongly recommended this be accomplished before taking the 8 hour course.
 - The Instructor/School must document completion of this requirement on the official I-ACT transcript.

Intermediate Level Syllabus

for use by

I-ACT Recognized Schools

and/or

I-ACT Recognized Instructors

(For use in preparing daily Lesson Plans)

Intermediate Level Syllabus

June 17, 2008

Prerequisites for Entry into Training

1. Each student **MUST** have a High School Diploma or equivalent requirement showing they have achieved High School Standards. This may be documented by Diploma, GED or equivalency exam such as the Wunderlich Ability to Benefit Test.
 - This must be completed prior to entering into training.
2. Each student **MUST** have completed a post Secondary (or higher) Anatomy & Physiology (A&P) Course of at least 3 Credit Hours (30 class room hours) from a licensed institution or from an institution or course on the I-ACT recognized list posted on the I-ACT website (www.i-act.org).
 - This must be completed prior to entering into training.
3. Each student **MUST** show proof that they have taken a CPR Class.
 - This must be completed prior to entering into training.
 - They must have a current CPR Card.
4. I-ACT recommends that each new student receive 1-3 colonics prior to entering training. This recommendation can be waived if the student has contraindications to receiving colonics.
5. Each student **MUST** be an I-ACT member prior to taking any I-ACT exam. The school or instructor can collect the application - with payment- and hold this until training is completed to submit with the entire package.
6. Individuals that are non-licensed medical health care providers **MAY NOT** take the Level 2 exam until they have been certified by I-ACT at the Foundation Level for a minimum of six months. This means all criteria for certification at the Intermediate Level must have been received and certification at the Foundation Level must be completed six months prior to taking the level 3 exam.

Requirements for Schools or Instructors

1. Each school / instructor will only train the students using FDA registered equipment, or equipment registered with appropriate agency in the country in which the instructor / school resides.
 - a. This training must follow the guidelines of the equipment as published by the manufacturer.
 - b. All internship must be supervised by an Instructor, and be consistent with I-ACT Policy.
2. Each school / instructor will have a contract outlining the enrollment agreement and refund policies of the school / instructor. Each student will receive a copy of this document.
3. Each school / instructor will provide the student with a certificate of completion for the classroom hours taught in the course.
4. The school / instructor will also notify I-ACT of each student that completes their training. This documentation will be done through the I-ACT transcript and mailed to the I-ACT office within 14 calendar days.
5. The school / instructor will maintain student records (attendance, quiz scores, etc.) for an indefinite period of time.
6. Each school / instructor will have an Anatomy & Physiology (A&P) pretest to ensure that the student has appropriate level of A&P knowledge to allow the student to have the opportunity to succeed in the training.

OFFICIAL I-ACT TRANSCRIPT

SCHOOL / INSTRUCTOR: _____

STUDENT: _____

ADDRESS: _____ STUDENT S.S.# _____

CITY: _____ STATE _____ ZIP _____ BIRTH: _____

PHONE:(_____) _____ E-Mail Address _____

Transfer Credit _____ Source: _____ DATE: _____

Prerequisite Verification

High School Diploma or Equivalent ----- Verified by _____ Date _____

Post Secondary A&P ----- Verified by _____ Date _____

CPR----- Verified by _____ Date _____

1-3 "Recommended" Colonics----- Verified by _____ Date _____

Certified at Foundation Level Six Months ---- Verified by _____ Date _____

INTERMEDIATE LEVEL

COURSE DESCRIPTION:	HOURS	GRADE:	COURSE DATES:
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Intermediate Anatomy & Physiology -----	_____	-----	_____
---	-------	-------	-------

Intestinal Toxemia -----	_____	-----	_____
--------------------------	-------	-------	-------

Complementary Modalities-----	_____	-----	_____
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30 minute Presentation-----	_____	-----	_____
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HOURS COMPLETED: _____ FINAL GRADE: _____ DATE: _____

Signature – I-ACT Instructor / I-ACT School Director Date

I certify the above course hours have been completed, and this individual is ready for certification. **Additionally, I will maintain documentation on this individual at my clinic/school indefinitely.**

This material will be made available during any I-ACT school/facility inspection.

Send This Transcript to I-ACT P.O. Box 461285 San Antonio, TX 78246-1285 210-366-2888
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**This Syllabus is to be used as a guide
for the I-ACT Recognized Instructor or School**

Intermediate Level

500 hour course

(100 hours comes from I-ACT Level 1)

The School or Instructor is authorized to modify this guide as required to be in compliance with the guidelines of your state or your state licensing agency.

It is the responsibility of the Instructor or School to ensure that the Student is adequately trained and prepared for a profession in colon hydrotherapy.

The I-ACT Intermediate Level test questions will be structured after these lesson plans.

It is the responsibility of each I-ACT School or I-ACT Instructor to verify that the appropriate I-ACT testing fee has been paid to I-ACT or collected by the School or Instructor. These fees may be submitted to I-ACT when the I-ACT Level 2 test is returned for grading by I-ACT.

In order for the student to complete their Level 2 (Intermediate Level) requirements, they must attend an I-ACT Recognized School, attend training by an I-ACT recognized Instructor, attend an I-ACT Regional or attend an I-ACT Convention to present their 30 minute presentation. As an option, they may provide a 30 minute video or a 3000 word essay to the I-ACT office.

**... See the I-ACT Guidelines for complete
Intermediate Level certification requirements ...**

Anatomy & Physiology

Unit 201.1 -- *Digestive System - Detailed* **(*appx 40 hours*)**

Student objectives:

1. Intermediate level information on the digestive system

- a. Mouth
- b. Pharynx /Esophagus
- c. Stomach (4 parts)
- d. Small intestine- (3 parts)
- e. Liver
- f. Pancreas
- g. Spleen
- h. Gall bladder
- i. Large intestine (colon)

1. Describe in intermediate level detail the inner workings and interaction of each part of the digestive system and the accessory organs that supports the alimentary tract.

2. Metabolism

- a. Carbohydrates
- b. Lipids
- c. Proteins
- d. Vitamins
- e. Minerals
- f. Enzymes

1. Describe the specific function of each part of the Digestive system with special emphasis on the reaction/action of enzymes, acids, bases, amino acids hormones, etc. on the specific part / organ.

Anatomy & Physiology

Unit 201.2 -- *Digestive System Disorders*

Student objectives:

1. Intermediate level information on the digestive system disorders

- a. Hemorrhoids
- b. Internal Hemorrhoids
- c. External Hemorrhoids
- d. Pilonidal Cyst
- e. Rectal Fissure
- f. Rectal Fistula
- g. Cryptitis
- h. Rectal Abscess
- i. Tumors
- j. Dysenteries
- k. Parasitic Infections
- l. Regional Enteritis
- m. Ulcerative Colitis
- n. Irritable Colon
- o. Appendicitis
- p. Diverticulosis
- q. Diverticulitis
- r. Peritonitis
- s. Herniations
- t. Intestinal Obstructions
- u. Adhesions
- v. Volvulus
- w. Constipation
- x. Diarrhea
- y. Leaky Gut
- z. IBS

- 1. Describe the specific disorder.

- 2. Recognize and understand these conditions and their implications to the session.

Anatomy & Physiology

Unit 201.3 -- *Nervous System & Digestion*

Student objectives:

1. Intermediate level information on the nervous system and its interaction on the digestion system

1. Describe the innervation of the alimentary tract.
2. Describe the innervation of the small and large intestine.
3. Describe the mechanism of defecation.

Anatomy & Physiology

Unit 201.4 -- *Cardiovascular System & Digestion*

Student objectives:

1. Intermediate level information on the cardiovascular system and its interaction on the digestion system

1. Describe the arteries that supply the intestinal tract.
2. Describe the arteries that supply the small and large intestine.
3. Describe the veins that support the intestinal tract.
4. Describe the veins that support the small and large intestine.

Intestinal Toxemia

Unit 202.1 -- *Intestinal Toxemia*

(appx 10 hours)

Student objectives:

1. Intestinal Toxemia

- a. Impaired Digestion
- b. Putrefaction and Toxemia
- c. Imbalance of Gut Flora
- d. Intestinal Inflammation
- e. Chronic disease
 - autoimmune
 - fibromyalgia
 - cancer
 - arthritis
 - skin disorder

1. The student will be able to describe in detail intestinal toxemia, putrefaction, and the proper balance of gut flora.

2. Describe in detail intestinal inflammation, and parasite infestation.

2. Intestinal Auto-Intoxication

Student objectives:

1. Describe in detail auto-intoxication and autoimmune disease.

Intestinal Toxemia

Unit 202.2 -- *Detoxification*

Student objectives:

1. Detoxification Pathways of the liver

1. The student will be able to articulate fully the detoxification functions of the liver.

2. The student will be able to describe in detail the pathways of Phase 1 and Phase 2 liver detoxification.

2. Environmental chemicals

1. Students will be able to discuss the chemicals in the environment in relationship to the digestive system.

Complementary Modalities

Unit 203.1 -- *Nutrition / Eating / Lifestyle*

(appx 10 hours)

1. Nutrition

Student objectives:

1. Student will learn about proper nutrition and the value of proper food combining.
2. Student will learn about dieting and the value of fiber to colon health.

2. Lifestyle

1. Student will understand the importance of choice in lifestyle planning, diet, and exercise.

3. Bowel Care

1. Student will understand the pros and cons of the use of and application of laxative, herbs, fiber, oils, stool softeners, enemas, food products, water, etc.

Complementary Modalities

Unit 204.1 -- *Complementary Modalities*

(340 hours - or two years of practice in healthcare)

1. Complementary Modalities and Alternative Therapies

Student objectives:

1. Student will learn about complementary and alternative modalities such as massage, myofascial release, reflexology, neuro-linguistic health, diet, nutrition, energy work, breath work, chakras, etc., as deemed appropriate by the student / school and or instructor.

NOTE:

- Each school / instructor will provide the student with a certificate of completion of the course.
- The school / instructor will also notify I-ACT of each student that completes their training.
- The school / instructor will maintain student records (attendance, quiz scores, etc.) for an indefinite period of time.

30 Minute Evaluation Form - For Level 2

Individual Being Evaluated _____ Presentation Date _____

Location _____

Evaluator's Name _____ Date: _____ Score: _____

Please elaborate on your judgements and opinions in detail whenever possible (10 points each - if applicable):

- 1) Start / stop on time?
- 2) Did Lecturer introduce themselves?
- 3) What did you learn from this presentation?
- 4) Was it stimulating?
- 5) Did the speaker appear groomed?
- 6) Personality / attitude / smile?
- 7) Was the speech interesting, did it capture audience and keep their attention?
- 8) Communicate to audience / eye contact / relate to audience?
- 9) Speak clearly / formulate well?
- 10) Seem to be knowledgeable / is prepared?

Comments:

I Recommend (circle one): Pass Fail

Evaluator Signature: _____ (please return to I-ACT home office)

Write on back if necessary.

Advanced Level Syllabus

for use by

I-ACT Recognized Schools

and/or

I-ACT Recognized Instructors

(For use in preparing daily Lesson Plans)

Advanced Level Syllabus

June 17, 2008

Prerequisites for Entry into Training

1. Each student **MUST** have a High School Diploma or equivalent requirement showing they have achieved High School Standards. This may be documented by Diploma, GED or equivalency exam such as the Wunderlich Ability to Benefit Test.
 - This must be completed prior to entering into training.
2. Each student **MUST** have completed a post Secondary (or higher) Anatomy & Physiology (A&P) Course of at least 3 Credit Hours (30 class room hours) from a licensed institution or from an institution or course on the I-ACT recognized list posted on the I-ACT website (www.i-act.org).
 - This must be completed prior to entering into training.
3. Each student **MUST** show proof that they have taken a CPR Class.
 - This must be completed prior to entering into training.
 - They must have a current CPR Card.
4. I-ACT recommends that each new student receive 1-3 colonics prior to entering training. This recommendation can be waived if the student has contraindications to receiving colonics.
5. Each student **MUST** be an I-ACT member prior to taking any I-ACT exam. The school or instructor can collect the application - with payment- and hold this until training is completed to submit with the entire package.
6. Individuals that are non-licensed medical health care providers **MAY NOT** take the Level 3 exam until they have been certified by I-ACT at the Intermediate Level for a minimum of one year. This means all criteria for certification at the Intermediate Level must have been received and certification at the Intermediate Level must be completed one year prior to taking the level 3 exam.

Requirements for Schools or Instructors

1. Each school / instructor will only train the students using FDA registered equipment, or equipment registered with appropriate agency in the country in which the instructor / school resides.
 - a. This training must follow the guidelines of the equipment as published by the manufacturer.
 - b. All internship must be supervised by an Instructor, and be consistent with I-ACT Policy.
2. Each school / instructor will have a contract outlining the enrollment agreement and refund policies of the school / instructor. Each student will receive a copy of this document.
3. Each school / instructor will provide the student with a certificate of completion for the classroom hours taught in the course.
4. The school / instructor will also notify I-ACT of each student that completes their training. This documentation will be done through the I-ACT transcript and mailed to the I-ACT office within 14 calendar days.
5. The school / instructor will maintain student records (attendance, quiz scores, etc.) for an indefinite period of time.
6. Each school / instructor will have an Anatomy & Physiology (A&P) pretest to ensure that the student has appropriate level of A&P knowledge to allow the student to have the opportunity to succeed in the training.

OFFICIAL I-ACT TRANSCRIPT

SCHOOL / INSTRUCTOR: _____

STUDENT: _____

ADDRESS: _____ STUDENT S.S.# _____

CITY: _____ STATE _____ ZIP _____ BIRTH: _____

PHONE:(_____) _____ E-Mail Address _____

Transfer Credit _____ Source: _____ DATE: _____

Prerequisite Verification

High School Diploma or Equivalent ----- Verified by _____ Date _____

Post Secondary A&P ----- Verified by _____ Date _____

CPR ----- Verified by _____ Date _____

1-3 "Recommended" Colonics ----- Verified by _____ Date _____

Certified at Intermediate Level One Year ----- Verified by _____ Date _____

ADVANCED LEVEL

COURSE DESCRIPTION: **HOURS** **GRADE:** **COURSE DATES:**

Advanced Anatomy & Physiology ----- _____ ----- _____ ----- _____

Complementary Modalities ----- _____ ----- _____ ----- _____

HOURS COMPLETED: _____ FINAL GRADE: _____ DATE: _____

Signature – I-ACT Instructor / I-ACT School Director Date

I certify the above course hours have been completed, and this individual is ready for certification. **Additionally, I will maintain documentation on this individual at my clinic/school indefinitely.** This material will be made available during any I-ACT school/facility inspection.

Send This Transcript to I-ACT
P.O. Box 461285
San Antonio, TX 78246-1285
210-366-2888

**This Syllabus is to be used as a guide
for the I-ACT Recognized Instructor or School**

Advanced Level

1000 hour course

(100 hours comes from I-ACT Level 1)
(400 hours comes from I-ACT Level 2)

The School or Instructor is authorized to modify this guide as required to be in compliance with the guidelines of your state or your state licensing agency.

It is the responsibility of the Instructor or School to ensure that the Student is adequately trained and prepared for a profession in colon hydrotherapy.

**... See the I-ACT Guidelines for complete
Advanced Level certification requirements ...**

Anatomy & Physiology

Unit 301.1 -- *Digestive System - Detailed*

(*appx 50 hours*)

Student objectives:

1. Advanced information on the digestive system

1. Describe advanced function of each part of the Digestive system with special emphasis on the reaction/action of enzymes, acids, bases, amino acids hormones, etc. on the specific part / organ and the result on the body.

2. Have an understanding of the interactions of foods/ vitamins/minerals throughout the alimentary tract.

2. Advanced information on the digestive system disorders and pathologies

1. Describe the advanced digestive system disorders, and understand the implication to the colon hydrotherapist.

2. Be able to explain the reason each disorder may be contraindicated, or if indicated for colon hydrotherapy, be able to explain why that disorder is indicated.

3. All diseases of the digestive system that could be referred by a physician

3. Advanced information on the nervous system and its interaction on the digestion system

1. Describe the innervation of the alimentary tract, the small and large intestine, and the mechanism of defecation.

4. Advanced information on the cardiovascular system and its interaction on the digestion system

1. Describe, in detail, the arteries and veins that supply the intestinal tract.

2. Describe, in detail, which arteries and veins support the accessory organs of the digestive system

5. Intestinal Toxemia and Auto-Intoxication

1. Describe in detail intestinal toxemia, leaky gut syndrome, and auto-intoxication theories both pros and cons.

Anatomy & Physiology

Unit 301.2 - Precautions (*appx 25 hours*)

Student objectives:

1. Known Precautions to Colon Hydrotherapy

Renal Insufficiency (Kidney Disease)
Benign Prostatic Hypertrophy
Acute Urinary Tract Infection

Dialysis

Peritoneal dialysis

Hemodialysis

Kidney/Bladder

Bloody urine

Abdominal Pain

Cardiac vs. Pulmonary Disease

Surgery-

- abdominal/thoracic cavity

12+ week recovery

- cosmetic/extremity

as referred

Shortness of Breath

Painful Breathing

Clients on oxygen therapy

1. Describe potential reasons for not getting a colon hydrotherapy session.

2. Understand why colon hydrotherapy is not recommended for each item in the list of precautions to colon hydrotherapy.

2. Diseases of Interest

Impaired Liver Function

Hepatitis

Fatty liver disease

Diuretic action

Kidney/Bladder/Adrenal disease

PCOS- Polycystic Ovary Syndrome

Hormone imbalance associated

w/ diabetes

Chronic Fatigue Syndrome

Diabetes

1. Understand the potential hazard of certain diseases and why they might be contraindicated for colon hydrotherapy.

2. Understand how to monitor whether or not to do a colon hydrotherapy session.

3. Understand how to modify a colon hydrotherapy session according to conditions.

3. Medications

Anti-inflammatories

Blood thinners

Diuretics

Etc.

1. Describe in detail the potential adverse impact certain medications may have on colon hydrotherapy.

2. Understand how to use the internet for research and reference.

4. Managing difficult conditions

Clients with history of seizure

Vasal - Vagal Response

Shock

1. Describe in detail the difficult conditions that may have an impact on colon hydrotherapy.

Complementary Modalities

Unit 302.1 -- *Complementary Modalities*

(appx 450 hours - or three years of practice in health care)

1. Complementary Modalities / Alternative Therapies

NOTE:

- Each school / instructor will provide the student with a certificate of completion for the course.
- The school / instructor will also notify I-ACT of each student that completes their training, this notification will be by using the I-ACT approved transcripts within 14 calendar days.
- The school / instructor will maintain student records (attendance, quiz scores, etc.) indefinitely and make these available during any I-ACT inspection.

Instructor Level Syllabus

for use by

I-ACT Recognized Schools

and/or

I-ACT Recognized Instructors

(For use in preparing daily Lesson Plans)

Instructor Level Syllabus

October 6, 2008

Prerequisites for Entry into Training

1. Each student **MUST** have a High School Diploma or equivalent requirement showing they have achieved High School Standards. This may be documented by Diploma, GED or equivalency exam such as the Wunderlich Ability to Benefit Test.
 - This must be completed prior to entering into training.
2. Each student **MUST** have completed a post Secondary (or higher) Anatomy & Physiology (A&P) Course of at least 3 Credit Hours (30 class room hours) from a licensed institution or from an institution or course on the I-ACT recognized list posted on the I-ACT website (www.i-act.org).
 - This must be completed prior to entering into training.
3. Each student **MUST** show proof that they have taken a CPR Class.
 - This must be completed prior to entering into training.
 - They must have a current CPR Card.
4. I-ACT recommends that each new student receive 1-3 colonics prior to entering training. This recommendation can be waived if the student has contraindications to receiving colonics.
5. Each student **MUST** be an I-ACT member prior to taking any I-ACT exam. The school or instructor can collect the application - with payment- and hold this until training is completed to submit with the entire package.
6. Individuals **MAY NOT** enter Instructor Level training until they have been certified by I-ACT at the Advanced Level.
7. All individuals **MUST** take this instructor course **BEFORE** presenting their one hour presentation at the Convention.
8. Instructors must attend one convention (or participate in an education committee meeting) every 2 years, and schools must attend the convention (or participate in an education committee meeting) each year. Failure to comply with this requirement may result in a “show cause letter” or provisional status.

Requirements for Schools or Instructors

1. Each school / instructor will only train the students using FDA registered equipment, or equipment registered with appropriate agency in the country in which the instructor / school resides.
 - a. This training must follow the guidelines of the equipment as published by the manufacturer.
 - b. All internship must be supervised by an Instructor, and be consistent with I-ACT Policy.
2. Each school / instructor will have a contract outlining the enrollment agreement and refund policies of the school / instructor. Each student will receive a copy of this document.
3. Each school / instructor will provide the student with a certificate of completion for the classroom hours taught in the course.
4. The school / instructor will also notify I-ACT of each student that completes their training. This documentation will be done through the I-ACT transcript and mailed to the I-ACT office within 14 calendar days.
5. The school / instructor will maintain student records (attendance, quiz scores, etc.) for an indefinite period of time.
6. Each school / instructor will have an Anatomy & Physiology (A&P) pretest to ensure that the student has appropriate level of A&P knowledge to allow the student to have the opportunity to succeed in the training.

OFFICIAL I-ACT TRANSCRIPT

SCHOOL / INSTRUCTOR: _____

STUDENT: _____

ADDRESS: _____ STUDENT S.S.# _____

CITY: _____ STATE _____ ZIP _____ BIRTH: _____

PHONE:(_____) _____ E-Mail Address _____

Transfer Credit _____ Source: _____ DATE: _____

Prerequisite Verification

High School Diploma or Equivalent ----- Verified by _____ Date _____

Post Secondary A&P ----- Verified by _____ Date _____

CPR----- Verified by _____ Date _____

1-3 "Recommended" Colonics----- Verified by _____ Date _____

Certified at Advanced Level----- Verified by _____ Date _____

INSTRUCTOR LEVEL

COURSE DESCRIPTION: **HOURS** **GRADE:** **COURSE DATES:**

Instructor 60 hour training----- _____ ----- _____ ----- _____

Instructor Presentation (1 of 3 hours)----- _____ ----- _____ ----- _____

Instructor Presentation (2 of 3 hours)----- _____ ----- _____ ----- _____

Instructor Presentation (3 of 3 hours)----- _____ ----- _____ ----- _____

Preparation of 50 Questions----- _____ ----- _____ ----- _____

HOURS COMPLETED: _____ **FINAL GRADE:** _____ **DATE:** _____

Signature – I-ACT Instructor / I-ACT School Director Date

I certify the above course hours have been completed, and this individual is ready for certification. **Additionally, I will maintain documentation on this individual at my clinic/school indefinitely.**

This material will be made available during any I-ACT school/facility inspection.

Send This Transcript to I-ACT
P.O. Box 461285
San Antonio, TX 78246-1285
210-366-2888

**This Syllabus is to be used as a guide
for the I-ACT Recognized Instructor or School**

Instructor Level Course (60 Hour Course)

Prerequisites (1000 Hours)

(100 hours comes from I-ACT Level 1 - Unit 101)

(400 hours comes from I-ACT Level 2 - Unit 201)

(500 hours comes from I-ACT Level 3 - Unit 301)

The School or Instructor is authorized to modify this guide as required to be in compliance with the guidelines of your state or your state licensing agency.

It is the responsibility of the Instructor or School to ensure that the Student is adequately trained and fully prepared to train other students for a profession in colon hydrotherapy.

To complete the I-ACT Instructor Level (Level 4) certification, the individual must:

A. Present a total of 4 hours of instruction - 3 of these hours must be completed as directed in this syllabi, and the last hour must be done at an I-ACT convention.

B. Additionally, the individual must prepare a test of 50 questions (multiple choice) on anatomy & physiology from the Foundation or Intermediate Level syllabi. Answers and source documentation/references for each answer should be provided on a separate sheet.

... See the I-ACT Guidelines for complete Instructor Level certification requirements ...

Level 4 (Instructor) - Unit 401

Section.....	Unit / Lesson (1000 hours).....	Page #
Foundation Level	I-ACT Level 1 (100 hours) Unit 101 <i>see Level 1 course syllabus</i>	
Intermediate Level.....	I-ACT Level 2 (400 hours) Unit 201 <i>see Level 2 course syllabus</i>	
Advanced Level	I-ACT Level 3 (500 hours) Unit 301 <i>see Level 3 course syllabus</i>	
Instructor Techniques	Unit 401 (40 hours)	
.....	Section 401.1 - Instructor Styles	3
.....	Section 401.2 - Preparing Lesson Plans.....	3
.....	Section 401.3 - Presentation Techniques	5
.....	Section 401.4 - Maintaining Control.....	5
.....	Section 401.5 - Practice Presentations.....	6
.....	Section 401.6 - Test Preparation.....	6
Instructor Presentations.....	Unit 402 (10 hours)	
.....	Section 402.1 -A & P Presentation.....	7
.....	Section 402.2 -A & P Presentation.....	7
Instructor Policies and Procedures.....	Unit 403 (10 hours)	
.....	Section 403.1 - Guidelines	8
.....	Section 403.2 - Transcript	9
.....	Evaluation form	10
.....	Inspection form.....	11
.....	Notes to schools & Instructors.....	12-13

Instructor Techniques

Unit 401.1 -- *Instructor Styles*

(appx 40 hours)

1. Instructor Styles

Student objectives:

1. Student will learn about various instructional styles and be allowed the opportunity to practice each style.
2. Student will learn methods of anchoring by varying tone, tempo, volume; body movements; and, spatial location.

Instructor Techniques

Unit 401.2 -- *Preparing Lesson Plans*

1. Lesson Plans

Student objectives:

1. Student will learn how to prepare and use lesson plans.
2. Student will understand the difference between a syllabi and a lesson plan
3. Student will understand student objectives and the relationship to lesson plan structures.
4. Student will be informed about appropriate textbooks, class handouts, enrollment application, enrollment agreement, A&P review exam, evaluation forms, lesson plans, schedule, and the certificate of training completion that they will be using in their class.

Instructor Techniques

Unit 401.2 -- Lesson Plan Outline (Draft)

Date: _____ Teacher Name: _____ Subject: _____

1. Topic

2. Content

3. Prerequisites

4. Goals & Objectives

- a.
- b.
- c.

5. Materials and Aids

6. Procedures/Methods

a. Introduction

- 1.
- 2.

b. Development

- 1.
- 2.

c. Modeling after the Instructor

- 1.
- 2.

d. Practice / Student Activities

- 1.
- 2.

e. Accommodations (Differentiated Instruction)

- 1.
- 2.

f. Checking for understanding / Lesson Assessment

- 1.
- 2.

g. Closure

- 1.
- 2.

7. Evaluation

- a.
- b.

8. Teacher Reflection / Self Assessment

9. Teacher Evaluation by Student

Instructor Techniques

Unit 401.3 -- *Presentation Techniques*

1. Presentation Techniques

Student objectives:

1. Student will learn how to prepare and use overhead transparencies, slides, multimedia software, etc.
2. Student will learn how to prepare student handouts.
3. Student will learn about sound equipment / recording devices.

Instructor Techniques

Unit 401.4 -- *Maintaining Control*

1. Maintaining Control

Student objectives:

1. Student will learn how to utilize questions to maintain control of the class.
2. Student will learn how to reframe questions for impact.
3. Student will learn how to handle difficult personalities, and use their energy to the benefit of the class.
4. Student will learn how to recognize students needing extra attention and practice.
5. Student will learn how to define and maintain boundaries in class.

Instructor Techniques

Unit 401.5 -- *Practice Presentations*

1. Practice

Student objectives:

1. Student will be trained to prepare 10 minute presentations on various topics using various teaching modalities (including the use of overheads, slides, etc.).
2. Student will present these presentations to the class for experience and learning using a beginning, middle, and end.
3. Students will be evaluated on these presentations with constructive suggestions provided.

Instructor Techniques

Unit 401.6 -- *Test Preparation*

1. Develop Test questions

Student objectives:

1. Student will be knowledgeable of multiple choice, true/false and fill in the blank questions.
2. Student will understand the difference between subjective and objective questions.
3. Student will understand how to provide source documentation for questions (document, page, paragraph, and sentence). Reference list of source documents should be made available by I-ACT.

2. Student will prepare a test of 50 questions and submit it to the education committee for review and acceptance

1. The test will be multiple choice (A, B, C, & D)
2. The test will be from the Foundation and Intermediate level Syllabi material.
3. The submission will include correct answers and source documentation on a separate sheet.
4. The source must be from a college level A&P Manual, Grays Anatomy, or the CIBA Collection - Digestive System, for example.

Instructor Presentations

Unit 402.1 -- 3 hour Instructor Presentation

1. Teach for at least three hours

Student objectives:

1. Student will prepare three individual one hour presentations on Foundation and Intermediate level A&P.
2. Student will present a three individual one hour presentations on Foundation and Intermediate level A&P and maintain classroom interest and class control.
3. Student will be evaluated by a minimum of eight people (desired).

2. Evaluate instructor candidates

1. Student will be evaluated on their ability to evaluate other students.
2. Student will understand the need for impartiality and fairness in the evaluation process.

Instructor Presentations

Unit 402.2 -- 1 hour Instructor Presentation at Convention

1. Teach one hour class at an I-ACT Convention

Student objectives:

1. Student will prepare a one hour presentation on A&P.
2. Student will present a one hour presentation on A&P and maintain classroom interest and class control.
3. Student will be evaluated by a minimum of eight people (desired).
4. Student will bring textbooks, class handouts, enrollment application, enrollment agreement, A&P review exam, evaluation forms, lesson plans, schedule, and the certificate of training completion that they will be using in their class.

Instructor Policies & Procedures

Unit 403.1 -- *Guidelines, Policies & Procedures*

1. Guidelines, Policies, & Procedures for Instructors & Schools

Student objectives:

1. Student will understand I-ACT guidelines for instructors and schools.
2. Student will understand the paperwork required to be maintained and the paperwork required to be sent to I-ACT.
3. Student will understand the assets available to new members on the I-ACT web site.
4. Student will understand how to download a current application for membership, and the fees for membership.

Instructor Policies & Procedures

Unit 403.2 -- *Transcript*

1. I-ACT Transcript

Student objectives:

1. Student will understand how to fill out the I-ACT Transcript.
2. Student will understand the requirements for maintaining the transcript.
3. Student will understand what paperwork to send to I-ACT.

NOTE:

- Each school / instructor will provide the student with a certificate of completion for the course.
- The school / instructor will also notify I-ACT of each student that completes their training.
- The school / instructor will maintain student records (attendance, quiz scores, etc.) indefinitely.

OFFICIAL I-ACT TRANSCRIPT

SCHOOL / INSTRUCTOR: _____

STUDENT: _____

ADDRESS: _____ STUDENT S.S.# _____

CITY: _____ STATE _____ ZIP _____ BIRTH: _____

PHONE: (____) _____ E-Mail Address _____

Transfer Credit _____ Source: _____ DATE: _____

Prerequisite Verification

High School Diploma or Equivalent _____ Verified by _____ Date: _____

Post Secondary A&P _____ Verified by _____ Date: _____

CPR _____ Verified by _____ Date: _____

1-3 "Recommended" Colotics _____ Verified by _____ Date: _____

FOUNDATION LEVEL

COURSE DESCRIPTION:	HOURS	GRADE:	COURSE DATES:
Business Ethics / Office Procedures (5 hrs)	_____	_____	_____
Health & Sanitation (5 hrs)	_____	_____	_____
Anatomy & Physiology (45 hrs)	_____	_____	_____
Colon Hydrotherapy			
- Theory/History/Practice (10 hrs)	_____	_____	_____
Complementary Modalities (5 hrs)	_____	_____	_____
Internship / Apprenticeship (29.75 hrs)	_____	_____	_____
15 minute Presentation (0.25 hrs)	_____	_____	_____

HOURS COMPLETED: _____ FINAL GRADE: _____ DATE: _____

Signature – I-ACT Instructor / I-ACT School Director _____ Date _____

I certify the above course hours have been completed, and this individual is ready for certification. Additionally, I will maintain documentation on this individual at my clinic/school indefinitely. This material will be made available during any I-ACT school/facility inspection.

Send This Transcript to I-ACT
P.O. Box 461285
San Antonio, TX 78246-1285
210-366-2888

6/17/08

I-ACT Instructor Certification ~ Presentation Evaluation Form

Individual Being Evaluated _____

Presentation Date _____ Location _____

Presentation Start _____ End Time _____ (Teaching time - 50 minutes)

Started on Time - Yes No

Dress is appropriate for presentation - Yes No

Weighted Actual

Score Score

Content		
Exhibits knowledge of content in presentation	6	
Uses accurate, up to date resources	4	
Answers questions accurately or says, "I will get back to you with the answer"	4	
Utilizes appropriate technology in presentation	4	
Organizes information so audience can grasp major concepts	6	
Content Total	24	
Preparation/Organization		
States clear and appropriate purpose - aims, objectives and learning outcomes	4	
Presents material in a well-organized, logical sequence, easy for participants to follow	8	
Presents appropriate amount of material for time	6	
Presents appropriate material from syllabus Level 1 & Level 2 - A & P	6	
Organizes/uses visual materials and provides pertinent handouts at an appropriate time	6	
Preparation/Organization Total	30	
Delivery		
Introduces self, including background, personal philosophy and future goals (5 min max)	4	
Presents in a clear and easy to understand voice; speaks easily and fluently	6	
Formulates ideas and explains them well and summarizes at end of presentation	6	
Presents without distracting mannerisms	4	
Gives enthusiastic, interesting/informative presentation	4	
Speaks at a speed appropriate for audience comprehension	4	
Maintains eye contact, limits use of notes: does not read Power-point slides	6	
Delivery Total	34	
Audience Involvement		
Accesses audience's understanding at appropriate intervals	4	
Encourages audience involvement	4	
Listens to and deals with questions effectively	4	
Audience Involvement Total	12	
TOTAL SCORE	100	

Please make comments on the back of this form

Passing Score: 70 - 100

Evaluator's Signature _____ Date _____

Revised 6/17/08

Checklist for Schools and Instructors:

1. Students have to complete ALL requirements for each level to get certified at each level. Make sure you go over the list of requirements with them so there are no surprises.
2. A list of all requirements for each level is in the membership packet that should be given to each student or prospective member. It is also on the website.
3. The membership package also includes a fact sheet, glossary of colon hydrotherapy terms, I-ACT policy statement, list of I-ACT recognized schools, the application for membership and copy of instructor certificate (current and valid).
4. Every school and instructor should have this package or it can be obtained from the I-ACT website or the home office.
5. Students have to be members in order to take the I-ACT tests.
6. Students have to pay for membership and test before taking the test.
7. The tests will not be graded and will be sent back to the instructor without payment and membership.
8. Go over the student's application before sending to I-ACT. Make sure all fields of information that apply are filled out legibly and correctly. Do not send blank applications. We need, at the very least, complete mailing address information (street address, city, state and zip code) and telephone contact information. Also, the name they want to appear on their certificate.
9. If they check off that they want to be on the internet and/or the call-in referral list make sure they include the following on their applications:
 - a. Business name
 - b. Business address
 - c. Business phone/fax numbers
 - d. Equipment name/type (Equipment must be FDA registered)
10. Inform students/prospective members of the following new I-ACT recommendations:
 - a. FDA guidelines require a prescription for purchase of equipment and supplies.
 - b. Therapists should get a prescription from each client from whoever has prescription authority in their state.
 - c. Follow the laws of your state.
 - i. Contact a lawyer to inform you of the laws of your state for Class II devices.

11. On the I-ACT transcripts:
 - a. Fill out all spaces that apply.
 - i. Don't just fill in a grade, record how many hours they completed.
 - ii. Make sure to record if they did the 15-minute presentation for Level 1, and the 30-minute presentation for Level 2.

12. On or with the applications:
 - a. Again make sure all payment information is enclosed with the application whether it be a check or credit card information.
 - i. If the member is paying with a credit card:
 - ii. Make sure the credit card number is correct.
 - iii. Make sure the expiration date is included.
 - iv. Make sure the security code is included (3 digits for Mastercard/Visa, 4 digits for American Express).

13. On all paperwork sent to I-ACT:
 - a. Fill out all spaces that apply.
 - b. Tell the student/member to PRINT NEATLY.
 - c. Instructors please PRINT NEATLY.
 - d. If you have to, type everything out on all paperwork.
 - e. Instructor should submit all exams and paperwork to I-ACT within 14 calendar days.

Additional Notes: