

TASK FORCE ON CADMIUM IN CHILDREN'S JEWELRY

Meeting Minutes

Thursday, October 9, 2014

2:00 PM in Room 2D of the LOB

I. CONVENE MEETING

- a. The meeting was convened at 2:10 PM

II. REMARKS BY THE CHAIRS

- a. Co-Chair Rep. Baram introduced Dr. John W. Birk to the task force. Rep. Baram noted those task force members who would be absent or late for today's meeting.

III. PRESENTATION BY: Dr. John W. Birk, Associate Professor of Medicine; Chief, Division of Gastroenterology; Director, Gastroenterology-Hepatology Fellowship Program (UCONN).

- a. Dr. Birk gave an overview of his presentation to the task force. Dr. Birk started by discussing normal digestion process to the task force from ingestion to expelling waste, indicating full digestion and exposure is a 24-48-hour range. Dr. Birk then discussed the various scenarios and limits the esophagus and stomach can pass foreign objects not intended for digestion and where it could reside permanently and require surgical removal. Dr. Birk discussed objects that would not get stuck in the esophagus but not pass through the stomach. He noted the most common item that is swallowed and becomes stuck in the stomach is coins, and noted button batteries as a high-risk item that children ingest can get stuck in the intestines. Dr. Birk then elaborated on what options are available to remove items from the body that are stuck, though he indicated that a majority of items ingested that are not sharp or show a clear and immediate health risk should be given the chance to pass within two to three days. However, if it does not pass in two to three days, invasive and non-invasive surgery options are presented. Dr. Birk elaborated on the various techniques surgeons used to remove foreign objects from the throat and stomach.
- b. Rep. Urban asked Dr. Birk if a child's body is different relative to the digestion process, to further elaborate on the impact diet can have on the breakdown, and then once the cadmium has been shed in stomach if absorption only takes place in the stomach or elsewhere in the digestion process. Dr. Birk responded that children have a faster transition time and would anticipate two days be the maximum it would take for a passable foreign object to exit the body. Dr. Birk then stated that a majority of the absorption of a toxic item like cadmium would more likely be absorbed in the small bowel as the stomach would partially break down the piece of jewelry and any exposed cadmium before it moved to the small bowel and the colon. He added the frequency of ingestion is important to consider when it comes to exposure and whether it becomes stuck in the system beyond the normal transit time. Rep. Urban informed Dr. Birk the additional potential distress that can occur to a piece of jewelry before ingestion, which includes chewing, sucking, biting, or banging the piece around.
- c. Rep. Baram asked additional questions regarding the differences in the digestion track for children and adults. Dr. Birk responded that there are some minor differences, but the risk for objects getting stuck and the overall system are the same between adults and children. Rep. Baram asked of any substances or agents that hospital staff might use to expel a foreign body out of a child's system faster. Dr. Birk responded that usually you would not, though you may provide a medication to relax the throat muscles if it was a piece of food stuck in the throat, but not blocking the airway. Dr. Birk added it generally not a good practice to administer a laxative to help them dispel a foreign object. Rep. Baram asked about the use of soda or carbonated beverages to help dispel a lodged item in the throat. Dr. Birk responded that oftentimes in the elderly they cannot tell if a piece of food has fully passed through the esophagus to the stomach and nurses will provide a carbonated beverage to create positive pressure to move the food through the digestive process or to indicate if it has actually passed. Rep. Baram asked about surgical extraction depending on the product's toxicity and the timeline of waiting before authorizing a surgery. Dr. Birk responded each case is unique, but in the case of battery or quarter he would recommend immediate extraction. The size, texture, form, and toxicity of other objects would primarily impact a doctor's decision. Rep. Baram asked about endoscopy and what occurs if a foreign body gets stuck in the small intestine. Dr. Birk responded that the endoscopy has limits. Rep. Baram asked if Dr. Birk had an idea of the percentage of incidents brought before him or UConn would be allowed to pass versus non-invasive/invasive surgeries. Dr. Birk responded that surgery is extremely rare and passing is more common than what I've reported to you. The majority of cases he's seen have objects stuck in either the esophagus or stomach and requires the endoscopy.

- d. Anne Hulick asked about whether there was a difference in options for removing foreign bodies between children and adults. Dr. Birk responded there is no difference. Anne Hulick followed up by asking about any changes in risk between adults and children depending on the removal option. Dr. Birk responded there is not much difference in risk.
- e. Brent Cleaveland asked if Dr. Birk could comment on total content versus migration test is proper to gauge risk of absorption, utilizing consumption of a penny as an example. Dr. Birk stated he was uncertain, but noted several factors, including the susceptibility of an item to break down and the absorption rate that need to be known to have greater certainty on the topic. He stated the smaller the piece is the less time you would likely be exposed to any toxins in the piece and what is being leached into the system.
- f. Dr. Ginsberg asked about the Ph level in the esophagus. Dr. Birk provided stated normally the Ph level is above four, but said items like jewelry caught in the esophagus of a child would be easily noticed because they would show signs of choking or distress. Dr. Ginsberg asked if a penny-sized foreign object be noticed in the esophagus. Dr. Birk replied yes, it would. Dr. Ginsberg asked if there are anatomical or pathological conditions that would retard migration out of the stomach. Dr. Birk replied that in general children would not, but for adults the use of medications could slow the transit time of digestion or if you have diabetes. Dr. Ginsberg asked about the impact of metals on the digestive tract. Dr. Birk responded that he did not know of any significant impact. Dr. Ginsberg asked for Dr. Birk's his opinion about the type of in vitro testing done to simulate the contents of the digestive track. Dr. Birk responded it is a reasonable test, but indicated the need to know data regarding actual absorption after extraction of cadmium and the level at which it is dangerous and is absorbed through tissue. Dr. Ginsberg asked if .07 the normal Ph level in the stomach and as acidic as it gets. Dr. Birk responded that it is and you have to assume it will always be below one.
- g. Rep. Dan Carter asked about the acidity of the small intestine. Dr. Birk responded that the process of acidity in different parts of the digestive track. Rep. Carter followed up with the average time a foreign body would be exposed to the acidity of a foreign body in the stomach. Dr. Birk responded that, without any complications, would stay for a relatively short period of time. Rep. Carter then asked whether non-invasive extraction of foreign bodies occurs more from the stomach or the small intestine. Dr. Birk responded the stomach. Rep. Carter followed up with an inquiry regarding whether Dr. Birk experienced or knew of a case where a foreign body had stayed in a child for up to 10 days or longer. Dr. Birk said there is scant evidence for cases like that. Dr. Birk added that the majority of items would pass through; however he believes these cases are underreported. Rep. Carter asked about what causes these incidents to become fatal. Dr. Birk stated fatal incidents go unnoticed until infection or internal bleeding occurs, at which point it is too late. Rep. Carter thanked Dr. Birk for his answers and concluded his questioning.
- h. Dr. Ginsberg asked for clarification about the timeframe of foreign bodies expelled from the body. Dr. Birk responded that he expected the stomach to be completely emptied of a meal within four hours unless a foreign object was too wide or too long when in transit and becomes stuck. Dr. Ginsberg asked how long an object could get stuck in the stomach without endoscopic intervention. Dr. Birk responded that it could vary by the size of the object, which can elevate risk of being cleared on its own.
- i. Tim Phalen asked a hypothetical regarding the timeline and options of a child ingesting costume jewelry. Dr. Birk responded it would vary by size, but if it were small enough it would pass through the system within four hours of sitting in the stomach. Tim Phalen asked if the child would show signs or symptoms of the item not passing. Dr. Birk stated they would more likely to not show visible symptoms of the item failing to pass. Tim Phalen asked about Dr. Birk's expertise or knowledge of toxicity. Dr. Birk responded his expertise is very limited and he could not elaborate on toxicity. Tim Phalen asked if he could elaborate on the cadmium incident in Japan referenced by Rep. Urban. Dr. Birk responded the incident in Japan occurred because cadmium accumulated in the water supply, which was then absorbed by rice crops that were ingested by the population, creating created chronic, long-term cadmium exposure.
- j. Brent Cleaveland asked how often he has had to perform surgery for stuck foreign bodies. Dr. Birk responded that surgery is quite rare, though endoscopy is more common. Brent Cleaveland asked if these items were of a certain size or larger. Dr. Birk responded they were of a smaller size range than a quarter. Brent Cleaveland discussed the tests that determine a level of safe, acute exposure to cadmium and then asked Dr. Birk his comments on that level. Dr. Birk asked for clarification on what determined a toxic level of exposure. Brent Cleaveland provided clarification that 200 PPM or above during a 24-hour heated, agitated test. Dr. Birk asked if this 200 PPM was the result of worst-case, 100% absorption during that time period and for specific test results that showed the

range. Brent Cleaveland responded that it was 200 PPM or less over a 24-hour period testing would be deemed safe. He added that he did not have specific test results before him, but the vast majority were either not visible or below 200 PPM. Dr. Birk noted it's difficult for him to respond without specific data

- k. Rep. Urban asked if the size ranges Dr. Birk mentioned previously were applied to adults and children. Dr. Birk responded that the size range is fairly identical between adults and children after age three. Rep. Urban asked if Dr. Birk had any knowledge regarding the absorption rate in the small intestine. Dr. Birk stated he did not have expertise in that area.

IV. ADJOURNMENT

- a. The meeting was adjourned at 3:26 PM.