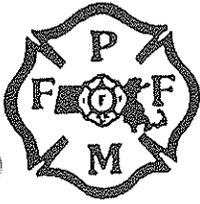


***Raised Bill No. 6956***

***AN ACT CONCERNING WORKERS'  
COMPENSATION COVERAGE FOR  
FIREFIGHTERS AND POLICE OFFICERS***

***Testimony given before the  
Committee on Labor and Public Employees  
of the  
Connecticut General Assembly  
Tuesday, January 30, 2007***

***Mr. Kenneth J. Donnelly  
Commissioner, Public Employee Retirement Administration Commission,  
Commonwealth of Massachusetts  
Secretary-Treasurer, Professional Fire Fighters of Massachusetts  
Lieutenant, Lexington Fire Department, Lexington, Massachusetts***



# Professional Fire Fighters of Massachusetts

Affiliated with International Association of Fire Fighters AFL-CIO and Massachusetts AFL-CIO Council

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## **Raised Bill No. 6956**

### *“An Act Concerning Workers’ Compensation Coverage for Firefighters and Police Officers”*

**Testimony given before the Committee on Labor and Public Employees of the  
Connecticut General Assembly  
Tuesday, January 30, 2007**

Good afternoon Mr. Chairman and members of the Labor and Public Employee  
Committee.

Introduction:

My name is Ken Donnelly,

- Ø Firefighter appointed 1972, Lieutenant appointed 1981 in the Town of  
Lexington, Massachusetts.
- Ø Elected Secretary-Treasurer of the Professional Fire Fighters of  
Massachusetts, 1993. Legislative Agent, 1986-1993. The Professional  
Firefighters of Massachusetts represents approximately 11,500 full time,  
paid, professional firefighters in 203 local communities.
- Ø Appointed Commissioner of the Public Employee Retirement  
Administration Commission (PERAC) 1997.  
(Chairman of the sub-committee on disabilities)

The PERAC Commission consists of seven members. Three (3) are appointed by  
the Governor of the Commonwealth of Massachusetts, three (3) are appointed  
by the Auditor of the Commonwealth of Massachusetts. The six members choose  
the chair position. I represent the Massachusetts AFL/CIO, which is one of the  
Auditor’s appointments.

PERAC has oversight of the 106 retirement boards in Massachusetts affecting  
over four hundred thousand active and retired public employees.

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All retirements must be approved by PERAC, including all medical disabilities. The Commission appoints the medical panels and set guidelines and regulations to be used by the doctors.

*“The Heart Law”*  
*Massachusetts General Law, Chapter 32, Section 94*

In 1950, the Massachusetts Legislature, passed a rebuttable presumption that, in the case of firefighters, any condition or impairment of health caused by heart disease or hypertension is service connected unless the contrary is shown by competent medical evidence.<sup>1</sup>

- Ø Resulting in total or partial disability.
- Ø Successfully passed a physical examination on entry into such service and subsequent exam failed to reveal such condition.
- Ø Presumed to have been suffered in the line of duty unless the contrary be shown by competent evidence.

From 1990-2006 there were one thousand two hundred and fifty two (1252)<sup>2</sup> heart related disabilities in Massachusetts, averaging seventy-eight (78) a year. Average age of those retiring was fifty-four (54) with twenty-eight (26) years of creditable service. Therefore, with the age factor multiplied by years of service, they would be normally entitled to approximately a 63% regular pension if they retired.

*“The Lung Law”*  
*Massachusetts General Law, Chapter 32, Section 94A*

Added to the retirement law in 1962, M.G.L. Chap.32, Section 94A, establishes a rebuttable presumption that in the case of a firefighter, suffers any condition or impairment of health caused by any disease of the lungs or respiratory tract is service connected unless the contrary is shown by competent medical evidence.<sup>3</sup>

- Ø Resulting in total disability
- Ø If he/she successfully passed a physical examination an entry into such service and subsequently failed to reveal such condition.
- Ø Presumed to have been suffered in the line of duty unless the contrary be shown by competent evidence.

Since the inception of self contained breathing apparatus, the numbers are minimal. However, as we become so painfully aware from 911, exposures to our respiratory system are still prevalent. Especially when you consider the fire service being the first line of response to terrorist attacks.

*“The Cancer Law”*  
*Massachusetts General Law, Chapter 32, Section 94B*

Added to the retirement law in 1990, M.G.L. Chap. 32, Section 94B establishes a rebuttable presumption that, in the case of a firefighter any condition or impairment of health caused

<sup>1</sup> “Guide to Application of GL c32 s94”, PERAC 2007

<sup>2</sup> “Firefighters Disability Retirees (Heart Related Conditions Statistics), PERAC Heart Related Summary, 2007”, PERAC 2007

<sup>3</sup> “Guide to Application of GL c32 s94A”, PERAC 2007

by any condition of Cancer affecting the skin, central nervous, lymphatic, digestive, hematological, urinary, skeletal, anal, prostate, and respiratory tract resulting in total disability or death is service connected unless the contrary is shown by a preponderance of the evidence.<sup>4</sup>

- Ø Resulting in total disability
- Ø If he/she successfully passed a physical examination, on entry and subsequently passed an exam and it failed to reveal any evidence of such condition.
- Ø Shall not apply to any person serving in such positions for fewer than five years.
- Ø Any person first discovering any such condition within five years of retirement shall be eligible.
- Ø Regularly responded to calls of fire and their investigation at the scene during some portion of the period of his/her service in such position.
- Ø Presumed to have been suffered in the line of duty unless the preponderance of evidence shows otherwise.

From 1990 – 2006, there were 407 approvals of cancer related disabilities, approximately 25 a year average.<sup>5</sup> The average age was 56 with 27 years of creditable service. Therefore, with the age factor multiplied by years of service they would normally be entitled to approximately a 68% regular pension if they retired.

There are approximately 11,500 full time, paid, professional firefighters in the State eligible for the these three presumption laws.

### *PERAC Medical Panels*

Are all applicants for the heart, lung and cancer presumption laws granted a disability?

No, in order to receive a presumptive heart, lung, or cancer disability, you must file an application with your respective retirement board. The retirement board then submits a request to PERAC for a medical panel. Such request must be accompanied with findings of fact that include that the applicant was a firefighter and during their career he/she responded to incidents related to their application.

The applicant has a choice of using a three-doctor panel or three individual doctors with expertise in the injury or illness he seeks to retire from. The three doctors must answer three questions.<sup>6</sup>

1. Is the member mentally or physically incapable of performing the essential duties of his or her job as described in the current job description?  
If 2 out of 3 say no, the process ends and disability is denied. If yes, you go to the second question.
2. Is the injury permanent? Same scenario as above.
3. Is the injury job related? This is where the presumption is considered.

Many of our members who are afflicted with cancer do not retire, because the illness is not totally disabling and it is not permanent.

<sup>4</sup> "Guide to Application of GL c32 s94B", PERAC 2007

<sup>5</sup> "Firefighters Disability Retirees (Cancer Presumptions Statistics)", PERAC Cancer Summary, 2007", PERAC 2007

<sup>6</sup> "Regional Medical Panel Certificate", PERAC 2007

## *Conclusions*

Being born in 1950, the same year the heart bill was passed, one can only assume the dialogue by our representatives for the legislation. However, as you will probably hear from many occupational experts today, firefighters suffer an excess risk for on-duty injuries associated with fire suppression and alarm response. Our members die younger and are afflicted with these diseases in a much higher proportion than the general population. This becomes even more evident when you consider that upon initial appointment our members have to pass physical and medical tests that would place them in a much healthier percentile than the general population.

As with all legislation, you will have stakeholders that are concerned with the cost of such legislation. Enclosed you will find newspaper articles on the Cancer legislation. The main opposition came from the Massachusetts Municipal Association and Local Government Officials. They estimated the cost of the Cancer Law to be between \$49 million to \$254 million over the next fifteen (15) years.<sup>7</sup>

These concerns were unfounded and very inaccurate, especially, in light of PERAC's fifteen-year history of these disability pensions. The average age of a firefighter retiring for cancer related disabilities is fifty-six with twenty-seven years of service. Therefore, with the age factor times years of service they would be entitled to approximately a 68% regular pension if they retired. "The Cancer Law" provides them with a 72% disability pension, a difference of 4%. The Massachusetts Legislature disregarded these preposterous assumptions, because they recognized that the opponents failed to recognize some key points.

1. Not every member that is afflicted with these presumptive diseases is granted a disability pension.
2. They calculated every pension on the total seventy-two percent factor, without taking into consideration that these members were entitled to a pension already.

However, there are differences in the two pensions, the main difference being that the disability pension is tax free, and the benefits to the survivors are better. Moreover, the actual cost to the community is minimal.

Furthermore, one must know the principles of funding a retirement system to understand why the cost to the community is minimal. Retirement systems base their funding on assumptions. These assumptions include; rate of return on assets, wage increases during career, mortality. In every system, there are losses and gains.

Let me explain a recent gain for a local retirement board in Massachusetts. A Fire Captain passed away in January of 2007 from a heart attack. He was fifty-six (56) years of age with thirty-four (34) years of service. He was entitled to eighty percent of his pay for the rest of his life if he survived and took a regular pension: A disability pension would have provided him with a 72% pension. He was not married and had no dependent children. As a result, and based on the eligibility requirements in the MGL Ch 32 there is no pension. In fact,

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<sup>7</sup> *Boston Globe*, July 3, 1990, *Boston Herald*, July 3, 1990

and based on the eligibility requirements in the MGL Ch 32 there is no pension. In fact, the system made money on his account. He had \$180,000 in his retirement account. The retirement system earned almost 17% on assets held last year, therefore, they made approximately \$30,000 on his money last year alone. State law only allows to credit the members annuity account with the average of passbook savings of 10 banks in difference regions of the Commonwealth, which last year was 0.6 %. Therefore, his account would have been credited with \$1,000. His beneficiary only receives the balance of his accumulated deductions, but no pension. During his career, the retirement board made hundreds of thousands of dollars on his accumulated deductions. One must consider the gains and losses of the funding assumptions when talking about the cost of these benefits to the retirement system.

Considering the hazards and stresses in the fire service, the Captain's story is not unusual. Through years of exposure to smoke, heat and toxic chemicals, firefighters suffer debilitating illness and death younger than the general population. In fact, many never receive the pension benefit they earned.

The main benefit in most presumptions is the survivor's benefit. In the enclosed newspaper article "His battle fueled change in law" the Lawrence Eagle Tribune, tells the story of Bernard Trainor, a Lawrence firefighter, father of ten children who has sinus and palate cancer.<sup>8</sup> William Middlemiss, President of the Lawrence Local union states, "It's not a bill for a man with cancer - it's a bill for the widow and children. It's a bill to take care of the children left behind." Shortly after Bernard retired under the Cancer presumption he in fact passed away. Even municipal officials who were concerned about the cost, "generally supported of the idea that firefighters deserve additional benefits because of the risks they face."<sup>9</sup> In a March 1990 study, the State Department of Public Health found that Massachusetts full-time firefighters had unusually high incidence of cancers covered by the bill. In some cancers they found that firefighters had three times the risk of the general population.

Moreover, the Massachusetts Legislature has long recognized that firefighting is a dangerous profession. Immediate response to unknown hazards without regard to one's life and health are commonplace. For the most part, firefighters are good caring citizens, providing for their family and friends. The Massachusetts legislature understood, that when a public safety employee is faced with an emergency, especially those that would put their health and safety at risk, they should not be burdened with the additional concern of weighing whether such risk will leave their families despondent.

In closing, after considering the difference between what a member is entitled to and what the member would receive under the proposed presumptions, the financial cost is minimal.

The real issue is do you value the sacrifices and risk taken by your firefighters.

If they die far too young or become sick or injured, will you recognize those risk by securing their families financial security?

<sup>8</sup> Lawrence Eagle Tribune, "His battle fueled change in law"

<sup>9</sup> Boston Globe, July 3, 1990

The General Laws of Massachusetts

CHAPTER 32. RETIREMENT SYSTEMS AND PENSIONS

***The Heart Law***

Chapter 32: Section 94. Impairment of health caused by hypertension or heart disease, resulting in disability or death of paid fire or police department member; presumption

Section 94. Notwithstanding the provisions of any general or special law to the contrary affecting the non-contributory or contributory system, ***any condition of impairment*** of health caused by hypertension or heart disease resulting in ***total or partial disability*** or death to a uniformed member of a paid fire department or permanent member of a police department, or of the police force of the Massachusetts Bay Transportation Authority, or of the state police, or of the public works building police, or to any employee in the department of correction whose regular or incidental duties require the care, supervision or custody of prisoners, criminally insane persons or defective delinquents, or to any permanent crash crewman, crash boatman, fire controlman or assistant fire controlman employed at the General Edward Lawrence Logan International Airport, shall, ***if he successfully passed a physical examination on entry into such service***, or subsequently successfully passed a physical examination, which examination failed to reveal any evidence of such condition, ***be presumed to have been suffered in the line of duty***, unless the contrary be shown by competent evidence.

As used in this section the words "permanent member of a police department" shall include a permanent member of the park police of a city or town.

Firefighters Disability Retirees  
(Heart Related Conditions Statistics)

1/25/2007

Approval Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Heart Presumption	52	50	68	57	41	46	52	33	37	43	41	46	38	68	48	47	47	814
Other Heart Related Disability Accidental or Ordinary Approvals	12	6	7	2		1	1	1	2	2	1	2		1	2			40
Accidental Death (Heart Related following Heart Presumption)			1			1												5
Accidental Death (Heart Related following Other Heart Related Disability Approval)		3	2		1		1		4	4	2	4	5	10	4	4		45
Accidental Death (Heart Related following no known prior Heart Related Disability Approval)	11	7	34	1	5	4	4	5	34	44	38	30	29	28	26	22	20	342
<b>Total Heart Related Approvals</b>	<b>75</b>	<b>66</b>	<b>112</b>	<b>60</b>	<b>47</b>	<b>52</b>	<b>58</b>	<b>40</b>	<b>77</b>	<b>93</b>	<b>82</b>	<b>84</b>	<b>73</b>	<b>107</b>	<b>81</b>	<b>73</b>	<b>72</b>	<b>1252</b>
Credible Service Years for Heart Presumption (Average)																		#DIV/0!
Retirement Age for Heart Presumption (Average)																		#DIV/0!

Firefighters Disability Retirees  
(Heart Related Conditions Statistics)

1/25/2007

Approval Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total	
<b>Type of Heart Condition:</b>																			
HEART DISEASE	9	30	44	22	11	13	11	11	10	19	18	26	29	49	40	30	18	390	
ARTERY DISEASE	9	3	19	9	7	11	16	10	16	23	22	14	12	18	16	10	22	237	
MYOCARDIAL INFARCT.	10	14	21	11	20	15	18	7	16	17	20	14	8	9	4	12	12	228	
HYPERTENSION	15	13	14	14	6	7	9	7	12	7	7	6	4	9	6	5	4	145	
CARDIAC ARREST						1	1	1	13	23	9	21	18	18	15	10	13	144	
UNCLASSIFIABLE	27	3	3															33	
ANGINA/CHEST PAIN	1	2	5	3	3	4	1	2	1	1	2	1	1	2				26	
STROKE/CVA	1					1	2	1	1	1	1	3		2		3	1	17	
UNKNOWN		1	3															6	
ANEURISM			1					1	1	1	1	1						5	
VASCULAR DISEASE									1		1	1		1				3	
HIGH BLOOD PRESSURE	1								1									2	
PULMONARY INSUFFIC.									1									2	
RENAL DISEASE	1		1						1	1								2	
RESPIRATORY ARREST									1		1							2	
PNEUMONIA									1									1	
STRESS	1																	1	
<b>All Heart Condition Total</b>	<b>75</b>	<b>66</b>	<b>112</b>	<b>60</b>	<b>47</b>	<b>52</b>	<b>58</b>	<b>40</b>	<b>75</b>	<b>92</b>	<b>82</b>	<b>84</b>	<b>72</b>	<b>106</b>	<b>81</b>	<b>72</b>	<b>70</b>	<b>1244</b>	
<b>Non Heart Condition:</b>																			
CANCER									1	1			1			1	1	5	
CH. OBS. LUNG DISEASE									1									1	
DIABETES														1				1	
HEAD INJURY/CONCUS.									2	1	0	0	1	1	0	1	2	8	
<b>Non Heart Condition Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>8</b>	
<b>Total - All Conditions</b>	<b>75</b>	<b>66</b>	<b>112</b>	<b>60</b>	<b>47</b>	<b>52</b>	<b>58</b>	<b>40</b>	<b>77</b>	<b>93</b>	<b>82</b>	<b>84</b>	<b>73</b>	<b>107</b>	<b>81</b>	<b>73</b>	<b>72</b>	<b>1252</b>	

The General Laws of Massachusetts

CHAPTER 32. RETIREMENT SYSTEMS AND PENSIONS

***The Lung Law***

Chapter 32: Section 94A. Disability or death caused by disease of lungs or respiratory tract; paid fire department member; presumption

Section 94A. Notwithstanding the provisions of any general or special law to the contrary affecting the non-contributory or contributory retirement system, any condition of impairment of health caused by ***any disease of the lungs or respiratory tract***, resulting in ***total disability*** or death to a uniformed member of a paid fire department, including, without limitation, any permanent crash crewman, crash boatman, fire controlman or assistant fire controlman employed at the General Edward Lawrence Logan International Airport, shall, ***if he successfully passed a physical examination on entry into such service*** or subsequent to such entry, which examination failed to reveal any evidence of such condition, be ***presumed to have been suffered in the line of duty***, as a result of the inhalation of noxious fumes or poisonous gases, unless the contrary be shown by competent evidence.

The General Laws of Massachusetts

CHAPTER 32. RETIREMENT SYSTEMS AND PENSIONS

***The Cancer Law***

Chapter 32: Section 94B. Disability or death caused by certain conditions of cancer; paid fire member; presumption

Section 94B. (1) Notwithstanding the provisions of any general or special law to the contrary, ***any condition of cancer affecting the skin or the central nervous, lymphatic, digestive, hematalogical, urinary, skeletal, oral or prostate systems, lung or respiratory tract, resulting in total disability or death*** to a uniformed member of a paid fire department, or a member of the state police assigned to the fire investigation unit of the department of fire services, or to any permanent crash crewman, crash boatman, fire controlman or assistant fire controlman employed at the General Edward Lawrence Logan International Airport, shall, ***if he successfully passed a physical examination on entry*** into such service or subsequent to such entry, which examination failed to reveal any evidence of such condition, be presumed to have been suffered in the line of duty, unless it is shown by a preponderance of the evidence that non-service connected risk factors or non-service connected accidents or hazards undergone, or any combination thereof, caused such incapacity. The provisions of this section shall only apply if the disabling or fatal condition is a type of cancer which may, in general, result from exposure to heat, radiation, or a known or suspected carcinogen as determined by the International Agency for Research on Cancer, so called.

(2) The provisions of this section ***shall not apply to any person serving in such positions for fewer than five years*** at the time that such condition is first discovered, or should have been discovered. ***Any person first discovering any such condition within five years of the last date on which such person actively so served shall be eligible*** to apply for benefits hereunder, and such benefits, if granted, shall be payable as of the date on which the employee last received regular compensation. The provisions of this section shall not apply to any person serving in such position unless such person shall first establish that he has ***regularly***

***responded to calls of fire or their investigation at the scene during some portion of the period of his service in such position.***

(3) The provisions of this section ***shall also apply to any condition of cancer, other than those listed in subdivision (1), which, in general, may result from exposure to heat or radiation or to a known or suspected carcinogen as determined by said International Agency for Research on Cancer, so-called, and the incidence of which is found by regulation by the commissioner of the department of public health to have a statistically significant correlation with fire service.***

(4) Nothing herein shall preclude a member from applying for and receiving benefits under section seven or section nine, subject to the provisions of said sections.

Firefighters Disability Retirees  
(Cancer Presumption Statistics)

1/25/2007

Approval Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Cancer Presumption	1	4	4	3	3	13	20	22	16	12	26	19	23	35	21	28	16	266
Accidental Death (Cancer Related following Cancer Presumption)			1						3	5	3	7	9	4	5	6	1	44
Accidental Death (Not Cancer Related following Cancer Presumption)										1		3	2	1		2	1	10
Accidental Death (Cancer Related no known prior Cancer Presumption)		2	1	3	2	6	3	1	9	12	16	8	7	4	6	7		87
<b>Total Cancer Related Approvals</b>	<b>1</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>19</b>	<b>23</b>	<b>23</b>	<b>28</b>	<b>30</b>	<b>45</b>	<b>37</b>	<b>41</b>	<b>44</b>	<b>32</b>	<b>43</b>	<b>18</b>	<b>407</b>
Credible Service Years for Cancer Presumption (Average)	11	18	26	18	30	26	31	30	30	28	31	33	31	31	30	29	29	27
Retirement Age for Cancer Presumption (Average)	46	45	52	58	56	57	60	59	58	57	59	60	58	59	57	57	55	56

Firefighters Disability Retirees  
(Cancer Presumption Statistics)

1/25/2007

Approval Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total	
Type of Cancer:																			
PROSTATE					1	3	9	5	7	3	15	6	5	14	13	9	7	97	
LUNG						2	3	3	5	10	12	11	11	6	3	13		79	
BODY		1	3	2	1	3	4	3	3	6	9	7	7	6	7	7		73	
COLON		1	1	2		4	2	5	2	2	1	2	5	2	4	2		35	
KIDNEY				1							2	3		7	1	2		17	
BRAIN	1	2	1		2			1	2	3			1				1	14	
ESOPHAGUS-THROAT						1			1	2	1	1	3	3				13	
LIVER					1	1			2	1	3		1	1				10	
JAW/MOUTH		1					1	1	1			1						8	
NECK								1			1		3	1				6	
UNCLASSIFIABLE									1									6	
ABDOMEN/STOMACH		1				3	1	1	1					1	1			5	
LARYNX							2	2	1									5	
MULTIPLE PART								1	1					1	1	2		5	
PANCREAS						2	1		1									5	
SKIN				1					1			1	1					4	
UNKNOWN																1		3	
BREAST																		2	
BUTTOCK										1			1					2	
HEART																		2	
SPINE			1									1						2	
BACK								1										1	
CHEST												1						1	
EYE																		1	
HEAD																		1	
All Cancer Type Total	1	6	6	6	5	19	23	23	28	29	45	34	39	43	32	41	17	397	
Non Cancer Type:																			
HEART										1		2		1		1		6	
LUNG												1	2					3	
HEAD												3	2	1	0	2	1	10	
Non Cancer Type Total	0	0	0	0	0	0	0	0	0	1	0	3	2	1	0	2	1	10	
Total - All Types	1	6	6	6	5	19	23	23	28	30	45	37	41	44	32	43	18	407	

The General Laws of Massachusetts

CHAPTER 32. RETIREMENT SYSTEMS AND PENSIONS

Chapter 32: Section 7. ***Accidental disability retirement***

Section 7. (1) Conditions for Allowance. — Any member in service classified in Group 1, Group 2 or Group 4, or any member in service classified in Group 3 to whom the provisions of subdivision (2) of section twenty-six are not applicable, ***who is unable to perform the essential duties of his job and that such inability is likely to be permanent before attaining the maximum age for his group by reason of a personal injury sustained or a hazard undergone as a result of, and while in the performance of, his duties at some definite place and at some definite time on or after the date of his becoming a member*** or prior to such date while any provision of this chapter relating to noncontributory pensions was applicable to him, without serious and willful misconduct on his part, upon his written application on a prescribed form filed with the board and his respective employer or upon such an application by the head of his department after a hearing, if requested, as provided for in subdivision (1) of section sixteen and subject to the conditions set forth in said section and in this section, shall be retired for accidental disability as of a date which shall be specified in such application and which shall be not less than fifteen days nor more than four months after the filing of such application but in no event later than the maximum age for his group. Except as provided for in subdivision (3) of this section, no such retirement shall be allowed unless such injury was sustained or such hazard was undergone within two years prior to the filing of such application or, if occurring earlier, unless written notice thereof was filed with the board by such member or in his behalf within ninety days after its occurrence. No such retirement shall be allowed unless the board, after a review of the evidence it deems appropriate, and after a review by the commission, pursuant to the provisions of section twenty-one, and including in any event on examination by the regional medical panel provided for in subdivision (3) of section six and including a certification of such incapacity by a majority of the physicians on such medical panel, shall find that such member is unable to perform the essential duties of his job and that such inability is likely to be permanent, and that he should be so retired. Any member who was injured while a member of a retirement

system established in any governmental unit other than that by which he is presently employed, and who has complied with the provisions of this section as to notice, or whose case falls under paragraph (3), shall file such application with the retirement board of the unit where he is presently employed. Such board shall secure a statement of facts and records, which it shall be the duty of the retirement board of the first governmental unit to furnish, and on which it shall be entitled to make recommendations.

Prior to the determination of a retirement under this section a member shall submit to the retirement board a written statement authorizing release of information from the federal internal revenue service and the department of revenue relative to the annual gross earned income of the member in pursuant to an agreement between the federal internal revenue service, the department of revenue, and the public employee retirement administration commission in accordance with section ninety-one A.

(2) Amount of Allowance. — Upon retirement under the provisions of this section a member shall receive an accidental disability retirement allowance to become effective on the date the injury was sustained or the hazard or account of which he is being retired was undergone, or on the date six months prior to the filing of the written application for such retirement with the board and his respective employer, or on the date for which he last received regular compensation for his employment in the public service, whichever date last occurs. Payments under such allowance shall be made as provided for in sections twelve and thirteen and the continuance of payments shall be governed also by the provisions of section eight.

(a) The normal yearly amount of such allowance for any member classified in Group 1, Group 2, or Group 4, or for any member classified in Group 3 to whom the provisions of subdivision (2) of section twenty-six are not applicable, shall, subject to the provisions of paragraphs (b) and (c) of this subdivision, be equal to the sum of —

(i) A **yearly amount of annuity** equal to the yearly amount of the regular life annuity specified in clause (i) of Option (a) of subdivision (2) of section twelve;

(ii) A yearly amount of pension equal to ***seventy-two per cent of the annual rate of his regular compensation*** on the date such injury was sustained or such hazard was undergone, or equal to seventy-two per cent of the average annual rate of his regular compensation for the twelve-month period for which he last received regular compensation immediately preceding the date his retirement allowance becomes effective, whichever is greater; provided, however, that for any employee who was not a member in service on or before January first, nineteen hundred and eighty-eight or who has not been continuously a member in service since that date, the total yearly amount of the sum of such pension and the annuity as determined in accordance with the provisions of clause (i) shall not exceed seventy-five per cent of the annual rate of regular compensation as determined in this paragraph; and provided further, that no individual who is a member in service on January first, nineteen hundred and eighty-eight, whose allowance is limited by the seventy-five per cent limitation as established in this paragraph shall receive an amount of pension that is less than seventy-two per cent of such individual's regular compensation on said January first, nineteen hundred and eighty-eight; and

(iii) A yearly amount of additional pension determined at the rate of ***three hundred and twelve dollars yearly for any surviving unmarried child*** of such member who is under age 18 or, if over that age and under age 22, is a full-time student at an accredited educational institution, or who was over said age and physically or mentally incapacitated from earning on the date of such member's retirement; provided, however, that in the state and teachers' systems and any other system electing to adopt the supplemental dependent allowance, the yearly amount of such additional pension shall be determined by the actuary as hereinafter provided. Such additional pension on account of any child shall be paid only so long as such child survives, remains unmarried and is under the age of eighteen or, if over said age, remains physically or mentally incapacitated from earning or, if over said age and under age 22, is a full-time student at an accredited educational institution. The words "full-time student" shall mean a child who is in full-time attendance in an accredited educational institution offering full-time courses of study equivalent to or higher than secondary school study. The words "accredited educational institution" shall mean any school, college, or university that is licensed, approved, or accredited, as the case may be, in the state in which it is located.

Beginning July first, nineteen hundred and eighty-eight, the additional pension provided by the supplemental dependent allowance shall be fixed at a rate of four hundred and fifty dollars for each eligible child. Beginning July first, nineteen hundred and eighty-nine, the supplemental dependent allowance rate shall be increased by an amount equal to the percentage increase of the cost of living determination made by the general court for such year pursuant to section one hundred and two. Systems may adopt the supplemental dependent allowance by an affirmative vote of the retirement board, ratified by the chief executive officer and legislative body as defined in paragraph (c) of subdivision (8) of section twenty-two. Adoption of the supplemental allowance by any system may not be revoked.

(b) For purposes of determining the normal yearly amount of any pension in accordance with the provision of this section or of section nine on account of the retirement or death of any member classified in Group 4 as a call fireman or reserve policeman, who was performing the duties of a call fireman or reserve policeman at the time the injury was sustained or the hazard was undergone which resulted in the granting of such pension, the annual rate of regular compensation of such member shall be considered to be the same as that of permanent firemen or policemen of lowest rank and grade, as the case may be, in the city or town in which he was employed; provided, that if there are no such permanent firemen or policemen, then the annual rate of his regular compensation shall be considered for such purposes to be seven thousand five hundred dollars.

(c) The total normal yearly amount of the retirement allowance of any member as determined in accordance with the provisions of this section shall not exceed the greater of the annual rate of his regular compensation on the date such injury was sustained or such hazard was undergone, and the average annual rate of his regular compensation for the twelve-month period for which he last received regular compensation immediately preceding the date his retirement allowance becomes effective, anything in this section to the contrary notwithstanding.

(d) Payments to a member retired under the provisions of this section who is incarcerated for having been convicted of a felony committed on or after the effective date of this paragraph shall

cease for the period of such member's incarceration. Under no circumstances shall such payments be recoverable by such member after such period of incarceration.

(3) General Provisions. — (a) Lapse of time or failure to file notice of an injury sustained or a hazard undergone as provided for in subdivision (1) of this section or subdivision (1) of section nine, as the case may be, shall not be a bar to proceedings under either of said sections if such member received payments on account of such injury or hazard under the provisions of chapter one hundred and fifty-two or in case he was classified in Group 2, Group 3 or Group 4 and not subject to the provisions of chapter one hundred and fifty-two, if a record of such injury sustained or hazard undergone is on file in the official records of his department.

(b) Except where an official record of an injury sustained by a member classified in Group 2, Group 3 or Group 4 exists as set forth in paragraph (a) of this subdivision, the head of a department shall, within fifteen days of the receipt of knowledge of a personal injury sustained by a member in his department as a result of, and in the performance of, his duties, notify the board in writing of the time, place, cause and nature of such injury, together with such further information relative thereto as he may obtain. In such case said notice shall have the same effect as though given by such member as otherwise provided for in this section or in section nine.

(4) Members Furnishing Aid to Other Governmental Units. — (a) Any governmental unit may, by action of the executive or board having jurisdiction in the commonwealth, the county commissioners in a county, the mayor in a city, the board of selectmen in a town, or by the action of any other executive or board having jurisdiction, as the case may be, request and authorize any member in service to go to the aid of a second governmental unit if in the judgment of the head of the department in which such member is regularly employed such action is necessary. While in the performance of his duties pursuant to such request and authorization such member shall be subject to the provisions of sections one to twenty-eight, inclusive, and shall have the same rights and privileges thereunder, as if performing the same duties within the scope of his regular employment.

(b) The governmental unit so requesting such assistance shall reimburse in full, in accordance with the provisions of this paragraph, the first governmental unit for any pension payments lawfully made from the system pertaining thereto on account of any injuries suffered by such member in the course of rendering such aid or on account of his death as the result of such injuries. The treasurer of the first governmental unit shall annually, on or before January fifteenth, upon the certification of the board of the system from which such disbursements have been made, notify the treasurer of the second governmental unit of the amount of reimbursement due therefrom for the previous fiscal year and such latter treasurer shall forthwith take such steps as may be necessary to insure prompt payment of such amount. All such payments due under the provisions of this paragraph from the second governmental unit shall be charged to the pension funds of the system pertaining thereto, or if there is no such system then they shall be paid by such government unit from a special appropriation, and as received they shall be credited to or appropriated for the pension fund of the system pertaining to the first governmental unit. In default of any such payment, the first governmental unit may maintain an action of contract to recover the same. This subdivision shall not be applicable to the Massachusetts Turnpike Authority or its employees' retirement system, the Massachusetts Housing Finance Agency or its employees' retirement system, the Massachusetts Port Authority or its employees' retirement system, the Blue Hills Regional Vocational School retirement system, the Greater Lawrence Sanitary District, or to the Minuteman Regional Vocational Technical School District employees' retirement system.

(5) Proration of pension. — In the event of a retirement where the injury was sustained in a governmental unit other than that by which the member is presently employed, the proration of the pension portion of the retirement allowance shall be computed by the actuary.

(6) Final Determination on Accidental Disability Applications.— Under this section the board shall make a final determination of such accidental disability application within one hundred and eighty days of the date of filing of such application except in the following instances:—

(1) the board, upon filing a written request outlining the specific circumstances for such a waiver, is granted an extension for a final determination by the commission or his designee; or

(2) the regional medical panel is unable to complete its examination and review and issue a written decision of the medical aspects of the case and is granted an extension by the commission or his designee.

COMMONWEALTH OF MASSACHUSETTS  
Public Employee Retirement Administration Commission

REGIONAL MEDICAL PANEL CERTIFICATE

MEMBER:  
PERAC ID#:

S.S. #:  
TYPE OF DISABILITY:

The member's retirement board will provide you with all information relating to the member's claimed disability and the current job description. This information is critical to your ability to perform a comprehensive medical evaluation and assess the member's ability to perform the essential duties of his/her job. If this information has not been received, please contact the PERAC Medical Panel Unit.

DID THE MEDICAL PANEL REVIEW THE MEMBER'S JOB DESCRIPTION?

YES  NO

DID THE MEDICAL PANEL RECEIVE AND REVIEW MEDICAL RECORDS IDENTIFIED ON THE TRANSMITTAL OF BACKGROUND INFORMATION TO A REGIONAL MEDICAL PANEL FORM PRIOR TO RENDERING A MEDICAL OPINION IN THIS CASE?

YES  NO

PLEASE LIST ANY RECORDS NOT LISTED ON THE TRANSMITTAL OF BACKGROUND INFORMATION TO A REGIONAL MEDICAL PANEL FORM, WHICH THE PANEL REVIEWED.

1. IS THE MEMBER MENTALLY OR PHYSICALLY INCAPABLE OF PERFORMING THE ESSENTIAL DUTIES OF HIS OR HER JOB AS DESCRIBED IN THE CURRENT JOB DESCRIPTION?

YES  NO

Please continue ONLY if you answered yes to question #1.

2. IS SAID INCAPACITY LIKELY TO BE PERMANENT?

YES  NO

**PERMANENCY:** A disability is permanent if it will continue for an indefinite period of time which is likely never to end even though recovery at some remote, unknown time is possible. If the medical panel is unable to determine when the applicant will no longer be disabled, they must consider the disability to be permanent. However, if the recovery is reasonably certain after a fairly definite time, the disability cannot be classified as permanent. It is imperative that the medical panel make its determination based on the actual examination of the applicant and other available medical tests or medical records which have been provided. It is *not* the physician's task to look into employment possibilities that may become available to an applicant at some future point in time.

# GUIDE TO THE APPLICATION OF G.L. c. 32, s. 94

## THE HEART LAW

Added to the retirement law in 1950, G.L. c. 32, s. 94 establishes a rebuttable presumption that, in the case of certain eligible public employees, any condition or impairment of health caused by heart disease or hypertension is service connected unless the contrary is shown by competent medical evidence.

IN YOUR ANALYSIS OF THIS CASE PLEASE CONSIDER:

### **Is there evidence that the heart disease or hypertension is not service connected?**

Questions on the Certificate for Accidental Disability (HEART) deal with this important issue. The Heart Law Presumption attributes heart disease or hypertension to the individual's employment unless the contrary is shown by competent evidence.

As indicated on the form, these non-service connected factors may be uniquely predominant influences on the mental or physical health, or may be accidents or hazards undergone which are not job-related.

### **Is there evidence that, although not irrebuttable, so predominates as to obligate a fact finder to come to the conclusion that for this particular applicant the heart disease or hypertension is caused by non-job related factors that are the basis for your answers to the Questions on the Certificate?**

In dealing with this question, you must focus on three areas

- The condition of the applicant
- Other factors which could have caused the disability
- The presumption

It is the responsibility of the medical panel to define, characterize and when possible quantify (e.g., compare to the average risk or provide a relative risk) influences that are uniquely predominant in their impact on the development of this condition. In other words, the medical panel when possible should provide scientific evidence that substantiates their rationale regarding how strong an impact the non- service connected influences have had on the development of the conditions in question. Keep in mind that the mere existence of evidence that heart disease or hypertension is not service connected does not alone cause the presumption to disappear completely.

Sufficient evidence to overcome the presumption might include:

- A congenital problem
- Non-work related pathology via infection, e.g., infectious endocarditis from abuse of intravenous drugs.
- Clear exposure to a condition outside of work, e.g., cocaine or alcohol induced cardiomyopathy.

If you find that, for this particular applicant, there is evidence that, although not irrebuttable, so predominates as to obligate a fact finder to come to the conclusion that the applicant's condition is caused by factors unrelated to his or her employment, then the presumption is overcome. If you make that determination, then your answer to Question 3 on the Certificate for Accidental Disability (HEART) is NO. Otherwise, the answer to Question 3 on the Certificate for Accidental Disability (HEART) is YES.

# GUIDE TO THE APPLICATION OF G.L. c. 32, s. 94A

## THE LUNG LAW

Added to the retirement law in 1962, G.L. c. 32, s. 94A establishes a rebuttable presumption that, in the case of certain eligible public employees, any condition or impairment of health caused by any disease of the lungs or respiratory tract is service connected unless the contrary is shown by competent medical evidence.

IN YOUR ANALYSIS OF THIS CASE PLEASE CONSIDER:

### **Is there evidence that the lung disease is not service connected?**

Questions on the Certificate for Accidental Disability (Lung) deal with this important issue. The Lung Law Presumption attributes any disease of the lungs or respiratory tract to the individual's employment unless the contrary is shown by competent evidence.

As indicated on the form, these non-service connected factors may be uniquely predominant influences on the mental or physical health, or may be accidents or hazards undergone which are not job-related.

### **Is there evidence that, although not irrebuttable, so predominates as to obligate a fact finder to come to the conclusion that for this particular applicant the lung disease is caused by non-job related factors that are the basis for your answers to the Questions on the Certificate?**

In dealing with this question, you must focus on three areas:

- The condition of the applicant
- Other factors which could have caused the disability
- The presumption

It is the responsibility of the medical panel to define, characterize and when possible quantify (e.g., compare to the average risk or provide a relative risk) influences that are uniquely predominant in their impact on the development of this condition. Keep in mind that the mere existence of evidence that the lung disease is not service connected does not alone cause the presumption to disappear completely.

Sufficient evidence to overcome the presumption might include:

- A confirmed inherited defect that results in an early or unusual presentation, e.g., alpha one antitrypsin deficiency and early COPD (Chronic Obstructive Pulmonary Disease) without significant confounding service exposures
- Non-work related pathology via infection, e.g., pneumocystis carinii in an individual with a non-service connected immune system compromise
- An exposure outside of work that results in a condition clearly defined as directly related to that exposure and nothing else, e.g., reactive airways dysfunction syndrome from high chlorine gas exposure while cleaning an enclosed pool filter outside of work.

If you find that, for this particular applicant, there is evidence that, although not irrebuttable, so predominates as to obligate a fact finder to come to the conclusion that the applicant's condition is caused by factors unrelated to his or her employment, then the presumption is overcome. If you make that determination, then your answer to Question 3 on the Certificate for Accidental Disability (LUNG) is NO. Otherwise, the answer to Question 3 on the Certificate for Accidental Disability (LUNG) is YES.

## GUIDE TO THE APPLICATION OF G.L. c. 32, s. 94B THE CANCER PRESUMPTION LAW

Added to the retirement law in 1990, G.L. c. 32, s. 94B establishes a rebuttable presumption that, in the case of certain eligible public employees (generally these employees are firefighters) any condition or impairment of health caused by any condition of cancer affecting the skin, central nervous, lymphatic, digestive, hematological, urinary, skeletal, oral, prostate and respiratory tract resulting in total disability or death is service connected unless the contrary is shown by a preponderance of the evidence.

Section 94B provides that the presumption shall only apply if the disabling or fatal condition is a type of cancer which may in general result from exposure to heat, radiation or a known or suspected carcinogen as determined by the International Agency for Research on Cancer (IARC).

### **Is there evidence that the cancer is not service connected?**

The Cancer Presumption Law attributes the development of a cancerous condition to the individual's employment. However, it is the responsibility of the medical panel to determine whether other factors may have caused the condition. A review of non-service connected factors related to the member's mental or physical health or the accidents or hazards undergone which are not job related is important.

### **Is the greater weight of the evidence such that it obligates a fact finder to come to the conclusion that for this particular applicant a uniquely predominant non-service connected influence on the member's mental or physical condition and/or non-service connected accident or hazard caused the incapacity or fatal condition of this applicant?**

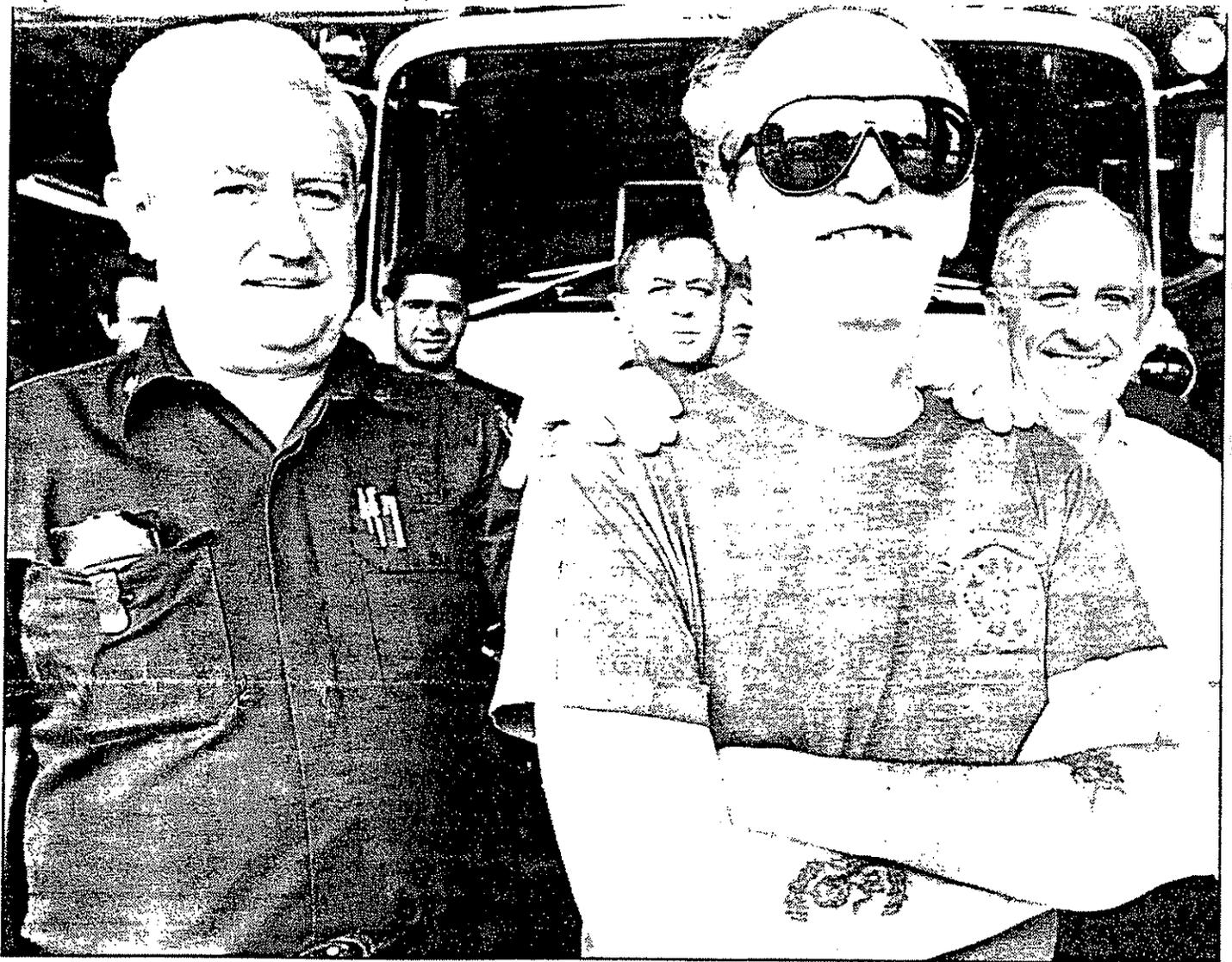
In dealing with this question, you must focus on three areas:

- The condition of the applicant
- Other factors which could have caused the cancer and subsequent disability
- The presumption

It is the responsibility of the medical panel to define, characterize and when possible quantify (e.g., compare to the average risk or provide a relative risk) influences that are uniquely predominant in their impact on the development of this condition. Keep in mind that the mere existence of evidence that the cancer is not service connected does not alone cause the presumption to disappear completely. Sufficient evidence to overcome the presumption might include:

- A non-work related exposure to a known cancer initiator and/or promoter resulting in a cancer of a unique presentation/pathologic characteristic recognized as pathognomic for that exposure, without significant confounding service exposure to the same carcinogen
- Clearly defined exposure outside of work with sufficient latency period, duration of exposure and convincing epidemiologic data as to a very strong linkage to the type of cancer in question and again no significant confounding service exposure to the same carcinogen.

If you find that, for this particular applicant, the greater weight of the evidence is such that it obligates a fact finder to come to the conclusion that a uniquely predominant non-service connected influence on the member's mental or physical condition and/or non-service connected accident or hazard caused the incapacity or fatal condition of this applicant, then the presumption is overcome. If you make that determination, then your answer to Question 3 on the Certificate for Accidental Disability (Cancer) is NO. Otherwise, the answer to Question 3 on the Certificate for Accidental Disability (Cancer) is YES.



Eagle-Tribune photo by Cheryl Senter

**Relief:** Firefighters at Lawrence Central Station on Lowell Street share relief at new law aiding firefighters with cancer.

From left, Lt. John Lannon, Bernard J. Trainor, who has cancer, and Deputy Chief Joseph Ferrigno.

# His battle fueled change in law

By Hilde Hartnett  
Eagle-Tribune Writer

LAWRENCE — Bernard J. Trainor can breathe a little easier now that a bill to help firefighters with cancer is law.

A father of 10 and a 13-year Fire Department veteran, he has cancer of the sinus and palate. Dozens of radiation and chemotherapy treatments have not been able to halt the disease.

Mr. Trainor, 43, known to friends as "Barney," can now rest assured that if he loses his battle with cancer, his wife and children will be cared for.

Under the bill, firefighters suffering from any of seven types of cancer will be presumed to have contracted it in the line of duty and will receive higher retirement benefits.

It was signed into law this

“The bill takes a lot of pressure off me and my wife.”

**Bernard Trainor**  
Lawrence firefighter

morning by Gov. Michael Dukakis at Lawrence's Pemberton Park.

Lawrence Rep. Kevin Blanchette filed the bill. He said his efforts to get it passed were largely fueled by Mr. Trainor's predicament.

"Obviously this bill is going to help him tremendously. He's an example of the hazards of the job," Mr. Blanchette said.

Firefighters who fought for the legislation for 10 years came from all over the state to watch the signing.

A 1990 state Public Health

Department study is one of several showing firefighters get some cancers far more often than others because of the smoke, fire and toxic chemicals on the job.

Some municipal officials opposed the bill because it will cost cities and towns an estimated \$49 million to \$294 million over the next 15 years.

"The bill takes a lot of pressure off me and my wife," Mr. Trainor said. "If I should have to retire, or if I should die, my wife could get 72 percent of my salary. Without it, I don't think

I could get anything," he said. He has not worked long enough to get a full pension, he said.

His wife, Joanne, said she is glad the bill passed because it gives her husband some peace. "But it's not going to keep him with me," she said.

Sitting outside the Lowell Street Fire Station, Mr. Trainor said he has much to be grateful for and has no regrets about choosing a profession he knew could be dangerous.

He was 38 when he found out he was sick. His wife, who has two children from a former marriage, was pregnant with a 10th child. The couple now has eight children under 15 living at their Warren Street home.

"I thought I had a bad tooth and I went to the dentist. He

Please see **FIREFIGHTER**,  
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## Firefighter From page 1

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told him, 'It's not the tooth,' " Mr. Trainor said.

Surgery and 39 radiation treatments transformed him from a robust to a gaunt man, but he thought he had the cancer beat. Last year, however, it returned. He underwent chemotherapy in November and plans more treatments this fall.

He suspects the cancer was caused by the fumes he inhaled on the job. Firefighters were not required to use oxygen masks until the mid 1970s. Even now, air tanks are often empty by the end of a fire, when dangerous gases are

most concentrated.

"You take a lot of smoke," he said. "Plastics and everything else."

His illness forced him to quit a side job he had at a liquor distributor. He now watches the children on his days off while his wife works two jobs. "The biggest thing now is taking care of them," he said. "They are a lot of fun. They take your mind off a lot of things."

Although he sometimes feels weak, he rarely misses work, his co-workers said. And when they try to give him a break, he sets them straight.

"There are days when he comes in and you look at him and know he's in pain," said Capt. Kevin Ord. "I've never seen him feeling sorry for himself. It hasn't slowed him down."

Mr. Trainor accepted friends' help when he needed rides to treatments and when they threw a fundraiser to help him with expenses. But when it comes to the job, he draws the line.

"If I don't feel I can do the job, then I'm going to have to leave," he said.

Methuen firefighter John R. Morin, 38, was also relieved when the bill passed. Diagnosed with lymph node cancer in February 1988, the father of two is now in remission.

"I worked through all the chemotherapy and two months of radiation therapy," he said with pride. His co-workers made it easier. "When I was sick, they were sick," he said.

William Middlemiss, president of the Lawrence Firefighters Union, lobbied hard for the bill.

"It's not a bill for a man with cancer — it's a bill for the widow and children. It's a bill to take care of the people left behind."

Mr. Trainor does not try to measure his chances of beating his illness.

"Cancer's a funny thing. It does not work on a timetable," he said. "There's always hope."

## Firefighter disability law passed

The House and Senate passed a bill yesterday that would make it easier for firefighters to qualify for disability benefits if they get certain types of cancer that have been linked to their jobs.

The bill passed the House 148-0 and the Senate on a voice vote. The measure is expected to be signed into law by Gov. Michael Dukakis.

The bill would create a presumption that certain cancers are job-related.

The Massachusetts Municipal Association had questioned the bill because of the increased costs it expects in pension liability, but efforts to get the state to pay the expected added costs failed to win legislative approval.



**At attention:** Firefighters from all over the state came .

(Signed: JULY 5, 1990)

**■ Dukakis signs bill to give cancer benefits to firemen**

LAWRENCE — Gov. Michael S. Dukakis has signed into law a bill which paves the way for firefighters who contract certain types of cancer to receive disability benefits.

The bill provides that firefighters who have worked for at least five years may retire because of disabling cancers which result from the nature and risk of the job and shifts the burden of proof from the firefighter to the city concerning the job-related nature of the cancer. Cities and towns may challenge the presumption if there is evidence that factors other than the job were involved in the development of the cancer.

The bill is based on several independent studies that showed a statistically significant relationship between certain types of cancer and fire fighting.

The bill had been questioned by the Massachusetts Municipal Association because of the increased costs to municipal pensions.

CHAPTER 100, Acts of 1990

# Way cleared for cancer pensions for firefighters

## Cities, towns would pay for expanded benefits

By Mitchell Zuckoff  
GLOBE STAFF

Massachusetts firefighters are on the verge of winning a 10-year battle to make it easier for them to win disability pensions if they get cancer, but their victory will come at the expense of cities and towns.

The Legislature gave final approval yesterday to a bill that would establish a legal presumption that most cancers among firefighters are job-related, vastly improving firefighters' chances to collect disability benefits. Gov. Dukakis is expected to sign the bill into law within two weeks.

The Legislature's action took on added significance because it marked the lawmakers' most direct attack on a provision of Proposition 2½ that obliges the state to pay for new programs it mandates that affect cities and towns.

However, the state constitution allows the Legislature to circumvent that portion of Proposition 2½ and require communities to bear the cost of new programs. Such moves require two-thirds' majorities; the House voted unanimously yesterday for the firefighters' legislation, and the Senate approved it overwhelmingly by voice vote.

Local officials, some of whom were caught off guard, reacted bitterly to the prospect that they would be forced to foot the bill for additional disability benefits. Estimates of the legislation's cost vary widely, from \$49 million to \$294 million over the next 15 years.

However, the officials were generally supportive of the idea that firefighters deserve additional benefits because of the risks they face. A recent study by the state Department of Public Health found that Massachusetts' 13,000 full-time firefighters had unusually high incidence of cancers covered by the bill.

Under the legislation, firefighters who contract

## ■ FIREFIGHTERS

Continued from Page 1

cancer of the skin, central nervous system, lymphatic system, digestive tract, blood, urinary system, skeletal system, mouth or prostate would not have to prove that the ailment was work-related to collect disability pensions. Firefighters and police officers stricken by heart, lung and related stress ailments have had similar protections for the past two decades.

But the increased costs associated with the expanded benefits angered local officials already reeling from cuts in state aid and an uncertain economy.

"This is outrageous in a year when local aid is level-funded and cities and towns across the commonwealth are slashing budgets," said Mary Kate Sampson, fiscal analyst at the Massachusetts Municipal As-

sociation, which led the fight against the funding provision.

"It is obvious that those big lobbies, the people with uniforms, seem to intimidate the Legislature," said Westfield Mayor George Varelas, a former police officer. "It seems the Legislature lacks the anatomy to say no to those people."

Fred Conley, town administrator in Natick, was among those who disagreed with the legislation in its entirety. "I believe in the notion that diagnoses are made on the medical evidence, not legislative presumption," he said.

"I think it's basically irresponsible, as well as insensitive, when they pass something that they think is necessary, then not come up with the money," said Conley.

The bill's sponsor, Rep. Kevin Blanchette (D-Lawrence), said the association and other opponents

have been making the same arguments every year for the past decade, even when times were good and local surpluses ran high.

"They can't debate this bill on the merits, so if they accept the merits they should face the fact that firefighters are municipal employees and therefore are their responsibility," Blanchette said.

Far more frightening to some than the bill itself was the thought that it represented a return to the days before Proposition 2½, when the state frequently created new costs for communities without offering extra aid.

Although other legislation enacted in recent years has had the effect of increasing municipal costs, the firefighters' bill was believed to be the first to purposely work around the limits of Proposition 2½.

"For a decade, one of the hall-

marks of Proposition 2½ was that we ended the state practice of mandating costs onto cities and towns," said Sen. Paul Cellucci (R-Hudson), who sponsored an unsuccessful amendment to require that the state fund the added disability costs. "This was the first major deviation from that, and I think it's a very dangerous road for the Legislature to be going down."

The new cancer legislation would

allow communities to challenge the finding of job-related disability, but the burden would be on local officials to show that the cancer most likely was caused by some other factor, such as heredity or behavior outside work. Eight other states have passed similar laws.

Disability pensions provide stricken employees with 72 percent of their last year's salary, tax free. In contrast, a firefighter who retires

on a standard pension with 20 years of service before age 55 would receive 40 percent of salary.

A jubilant Bob McCarthy, president of the Professional Firefighters of Massachusetts, the union that represents about 12,000 firefighters, said yesterday, "The importance of this is that despite the job we have, and the hazards that we encounter, we know that our widows and children are protected now."

# Firefighter Heart Presumption Retirements in Massachusetts 1997–2004

Jonathan D. Holder, DO, MPH  
 Leonard A. Stallings  
 Lynne Peeples, MS  
 John W. Burress, MD, MPH  
 Stefanos N. Kales, MD, MPH

**Objective:** “Heart Presumption” legislation is common throughout North America. We sought to study Massachusetts firefighters retiring with heart disability awards. **Methods:** The authors conducted a retrospective review of Massachusetts firefighters: 362 receiving Heart Presumption pensions (1997–2004) and a comparison group of 310 professionally active firefighters. **Results:** Of retirements, 77% were due to coronary heart disease and 23% for other cardiovascular conditions. Only 42% of the retirements were related to discrete on-duty events. Fire suppression (odds ratio = 51, 95% confidence interval = 12–223) and alarm response (odds ratio = 6.4, 95% confidence interval = 2.5–17) were associated with markedly higher risks of duty-related heart retirement events than nonemergency activities. Cardiovascular risk factor prevalence was high among all retiree subgroups and significantly greater than among control firefighters in almost all cases. **Conclusions:** Our study supports calls for improved cardiovascular prevention and risk reduction strategies among firefighters. (*J Occup Environ Med.* 2006;48:1047–1053)

Cardiovascular disease, primarily due to coronary heart disease (CHD), is the leading cause of lifetime mortality among firefighters as well as principal cause of “on-duty deaths” (fatalities resulting from injury or illness occurring during fire department duties). Cardiovascular disease accounted for approximately 45% of firefighters’ on-duty deaths from 1977 to 2004.<sup>1–3</sup> This compares with 22% of on-duty deaths due to CHD among police and detectives, 15% among occupational fatalities overall,<sup>2</sup> and 11% among other emergency medical service workers.<sup>4</sup> We recently demonstrated that most on-duty CHD fatalities in the fire service are likely to be work-precipitated and occur in firefighters with underlying CHD.<sup>5</sup>

Experts have often held that smoke exposure, physical exertion, and psychologic stressors increase cardiovascular risk among firefighters.<sup>6</sup> The Industrial Disease Standards Panel in Toronto, Canada,<sup>7</sup> and “Heart Presumption” legislation in 37 U.S. states and two Canadian provinces<sup>8</sup> have accepted this assumption compensating firefighters who develop CHD and other vascular disease. However, scientific evidence of increased cardiovascular mortality rates among firefighters remains inconclusive.<sup>9–12</sup>

Despite the implementation of Heart Presumption legislation throughout much of North America and the associated individual, family, community, and societal costs of premature deaths and disability, little is known regarding the occupational and medical risk factors underlying these retirements. We are not aware of any studies describing the health

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This study was supported by research grant T42/CCT122961-02 from the National Institute of Occupational Safety and Health/Harvard ERC and a grant from the Public Employee Retirement Administration Commission of Massachusetts.

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DOI: 10.1097/01.jom.0000235909.31632.46

status of the firefighters receiving these legislated pensions. Therefore, we undertook a systematic study of Heart Presumption retirements among Massachusetts firefighters. In this article, we describe the medical basis of the retirements, compare underlying cardiovascular risk factors between those retiring due to CHD and those retiring due to other cardiovascular diagnoses, and compare firefighters whose retirements were associated with discrete on-duty events with retirees whose cardiovascular disease manifested off-duty. Finally, we compare the retirees' prevalence of cardiovascular risk factors with those of professionally active Massachusetts firefighters.

## Materials and Methods

### Study Population

**Retirees.** We included all firefighters awarded Heart Presumption or other cardiovascular-related disability pensions from 1997 to 2004 from the Commonwealth of Massachusetts in accordance with state law and Public Employee Retirement Administration Commission (PERAC) guidelines and whose cases underwent review by PERAC-appointed medical panels. PERAC identified these cases by searching their database for all firefighters with disability pensions June 1996 through the end of 2004 and any of the following: an injury description field entry that was cardiovascular; a medical review panel field entry of "cardiology"; a body part field entry of "heart"; or disability field entry of "accidental heart," "accidental cardiac," "ordinary cardiac," or "accidental death cardiac." PERAC nurses then reviewed all the cases with medical files identified to ensure that the disability benefit awards were cardiovascular-related. Finally, we excluded any cases whose date of retirement was before January 1, 1997, or after December 31, 2004.

We developed a standardized data extraction form, which was then used by PERAC nurses to extract all relevant information by hand from re-

tirement administration files. Coded data extraction sheets, void of personal identifiers, were reviewed by a physician (JDH) and clarified when necessary with the nurses before entry in an SPSS 12 database.<sup>13</sup> The human subjects committee of the Harvard School of Public Health examined our protocol and determined that the use of the anonymous coding sheets was exempt from further review.

**Professionally Active Control Firefighters.** We used a well-characterized cohort of 310 professional firefighters, drawn from all regions of Massachusetts, who underwent baseline medical surveillance in 1996/1997. Their testing included a full medical history, examination, and nonfasting metabolic profile. The control firefighters' vital status and continued professional activity in Massachusetts were redocumented at a 1998 periodic examination. The periodic examinations of these firefighters and their results, including cardiovascular risk factors and other health information, have been previously characterized in detail.<sup>5,14-17</sup> The use of these examination results for research has been approved by the Institutional Review Boards of the Harvard School of Public Health, the Cambridge Health Alliance, and the Northeast Specialty Hospital.

### Primary Variables of Interest and Their Definitions

The presence of major cardiovascular risk factors were defined for both groups according to the Framingham study<sup>18</sup> and our previous firefighter fatality investigation.<sup>5</sup> Hypertension was considered present if a resting blood pressure was  $\geq 140/90$  mm Hg, the firefighter had a diagnosis of hypertension, and/or the firefighter was receiving antihypertensive therapy. We also considered firefighters as hypertensive if there was documentation of left ventricular hypertrophy, a finding highly associated with hypertension.<sup>18</sup> Firefighters with a smoking history were

classified as current smokers unless they had quit smoking more than 12 months before their diagnosis or examination.<sup>18</sup> We considered those having serum cholesterol  $\geq 200$  mg/dL, a diagnosis of hypercholesterolemia, and/or prescribed lipid-lowering therapy as hypercholesterolemic. Diabetes mellitus was defined as present if the firefighter had received this diagnosis, was receiving insulin or hypoglycemic medication, and/or blood glucose exceeded 150 mg/dL.<sup>18</sup> Body mass index was calculated from each firefighter's height and weight according to international guidelines.

Preexisting evidence of CHD or other arterial occlusive disease was defined as any of the following: a previous abnormal exercise or radionuclide stress test or a history of coronary artery bypass grafting, angioplasty, myocardial infarction, angina, carotid stenosis, or peripheral vascular disease.<sup>5</sup>

We defined on-duty retirements as those based on illness or fatality "occurring while a firefighter was working and/or performing any fire department duty<sup>3"</sup> in agreement with the National Institute of Occupational Safety and Health, Federal Emergency Management Agency (FEMA), and National Fire Protection Association (NFPA)<sup>2,3</sup> and our previous study.<sup>5</sup> Professional duties engaged in during or proximate to an "on-duty" event were also classified in accordance with our previous investigation of firefighter CHD fatalities.<sup>5</sup>

### Estimation of the Relative Proportions of Firefighters' Time Spent in Different Duties

Like in our previous study,<sup>5</sup> to estimate the proportion of time firefighters spend in each type of duty, we used information from fiscal year 2002 from the Cambridge, Massachusetts, Fire Department serving a community of approximately 100,000 inhabitants. The department provided: the total number of incidents, runs, and run times; the

distribution of emergency calls and dispatches by hour of the day; a breakdown of incident types between fire and nonfire emergency responses; as well as mean incident and mean response times and the estimated number of hours spent each week in training and fire prevention activities, respectively.

**Statistical Analysis.** We performed analyses with SPSS 12<sup>13</sup> and SAS.<sup>19</sup> Independent *t* tests were used to compare differences in mean values.  $\chi^2$  values were used to compare differences in proportions among groups. Multivariable adjusted comparisons of proportions were calculated with binary logistic regression and examined each risk factor as an independent predictor controlling for all other covariate risk factors. We set the level of statistical significance at 0.05 (two-tailed) for all tests.

**Results**

During the study period, we identified 362 cardiovascular-related disability awards with medical files in the Commonwealth of Massachusetts. Of the 362 cases, 351 (97%) were classified as Heart Presumptions and 11 were legally classified as another heart-related type of disability. Two (0.6%) had fatal events that led to their presumption awards. The remaining 360 affected firefighters retired with a disability pension. The retirees ranged in age from 31 to 66 years with a mean of  $54 \pm 7$ , whereas the controls ranged from 20 to 58 years with a mean of  $39 \pm 7$  ( $P < 0.001$ ). Among the heart retirees, 83% were over 50 years old, whereas 95% of the active firefighters were less than 50 years old.

CHD accounted for 77% of all heart retirements. Among those awarded pensions for non-CHD causes hypertension/hypertensive heart disease accounted for over one third of those cases and 8% of the total. The remaining pensions were awarded for supraventricular arrhythmias (5%), cardiomyopathy (3%), cerebrovascular accidents (3%), syncope (1.4%),

**TABLE 1**

Characteristics of the Retirements: CHD Retirements versus Non-CHD Retirements

	CHD Retirements (n = 278) Percent (n)	Non-CHD Retirements (n = 84) Percent (n)	P	Multivariate P*
Age $\geq 45$ yr	94 (262)	87 (72)	0.031	<0.0001
Age >50 yr	77 (213)	77 (64)	NS	—
Current smoking	30 (76)	22 (13)	NS	0.011
Hypertension	59 (142)	74 (54)	0.027	0.205
Diabetes mellitus	26 (62)	17 (10)	NS	0.003
Cholesterol $\geq 5.18$ mmol/L (200 mg/dL)	81 (170)	64 (21)	0.040	0.752
Prior diagnosis of CHD or other evidence of arterial-occlusive disease	22 (48/215)	0 (0)	—	0.012
Obesity, body mass index $\geq 30$ kg/m <sup>2</sup>	41 (98/238)	66 (41/62)	0.001	0.650

\*Multivariate analyses adjusted for all listed predictors with the exception of age >50 yr (age  $\geq 45$  used).

CHD indicates coronary heart disease.

aortic aneurysms (1.1%), and other (1.1%), respectively.

Table 1 compares CHD retirements with non-CHD retirements with respect to cardiovascular disease risk factors. The non-CHD retirements included more firefighters under the age of 45 ( $P = 0.031$ ) and were more likely to be hypertensive ( $P = 0.027$ ) and obese ( $P = 0.001$ ). The CHD retirements were more likely to have high cholesterol ( $P = 0.040$ ). Overall, however, the risk factor profiles were similar. In multivariate analyses, the differences for age, smoking, and diabetes were significant. Of the 48 cases with a preexisting diagnosis of arterial occlusive disease, 38 (79%) had preexisting CHD alone. Four (8%) had only peripheral vascular disease, two (4%) had only cerebrovascular disease and four (8%) had CHD in addition to peripheral vascular disease or cerebrovascular disease. When CHD cases with a preexisting diagnosis of CHD or other arterial occlusive disease were excluded (data not shown), the prevalence of risk factors remained quite similar among the CHD retirements, and the comparison with non-CHD cases also was not substantially different.

Information on the retirement's relation to firefighting duties was available for 347 (96%) of the firefighters. Only 42% of Heart Presumption retirements occurred on-duty, whereas the majority retired due to disease that manifested off-duty (cumulative). Table 2 compares these two groups with respect to cardiovascular disease risk factors. There were no significant differences, although the off-duty retirements had somewhat more prevalent smoking, diabetes mellitus, and obesity. Limiting this comparison of on-duty versus off-duty retirements with CHD cases (data not shown) did not materially alter the results with the exception that the excess prevalence of smoking among the off-duty group reached a trend level ( $P = 0.068$ ) of significance in univariate analysis.

Table 3 describes the estimated relative risks of an on-duty heart retirement precipitating event among various job duties adjusted for the estimated proportion of time per year spent in each activity. Compared with nonemergency duty, we found significantly increased risks during fire suppression (odds ratio [OR] = 51, 95% confidence interval [CI] = 12–223) and alarm response (OR = 6.4, 95% CI = 2.5–17).

**TABLE 2**  
Characteristics of Heart Retirements: On-Duty versus Off-Duty

	On-Duty Retirements (n = 147) Percent (n)	Off-Duty Retirements (n = 200) Percent (n)	P	Multivariate P*
Age $\geq$ 45 yr	92 (135)	94 (188)	0.522	0.802
Age >50 yr	78 (115)	76 (153)	0.796	—
Current smoking	24 (30)	32 (57)	0.156	0.173
Hypertension	60 (73)	64 (113)	0.628	0.484
Diabetes mellitus	20 (24)	26 (43)	0.259	0.684
Cholesterol $\geq$ 5.18 mmol/L (200 mg/dL)	76 (75)	80 (108)	0.523	0.109
Prior diagnosis of coronary heart disease or other evi- dence of arterial-occlusive disease	18 (20)	17 (25)	0.869	0.847
Obesity, body mass index $\geq$ 30 kg/m <sup>2</sup>	42 (50)	49 (83)	0.232	0.563

\*Multivariate analyses adjusted for all listed predictors with the exception of age >50 yr (age  $\geq$ 45 used).

**TABLE 3**  
Relative Risk of On-Duty Retirement for Various Job Duties Adjusted for the Estimated Proportion of Time per Year Spent in Each Professional Duty

Type of Duty	Actual Heart Events (n = 117) Percent (n)	Expected Heart Events (n = 117) Percent (n)	Odds Ratio (95% confidence interval)
Fire suppression	43 (50)	2 (2)	51 (12–223)
Training	2.6 (3)	8 (9)	0.68 (0.2–2.7)
Alarm response	19 (22)	6 (7)	6.4 (2.5–17)
Alarm return	1.7 (2)	10 (11)	0.37 (0.07–1.8)
Emergency medical service/nonfire emergency	8.5 (10)	23 (27)	0.75 (0.3–1.8)
Fire house and other nonemergency activities	26 (30)	52 (61)	1 (—)

Table 4 compares CHD retirements with professionally active control firefighters. In unadjusted comparisons, all risk factors except obesity were statistically significant predictors of CHD retirement. In multivariate comparisons, age, current smoking, diabetes, and prior arterial occlusive disease were all significant independent predictors of CHD retirement. Age was the strongest predictor (adjusted OR = 5.2, 95% CI = 1.9–13.9).

Table 5 compares non-CHD retirements with professionally active control firefighters. In unadjusted comparisons, all risk factors except elevated cholesterol were statisti-

cally significant predictors of non-CHD retirement. In multivariate comparisons, only age and hypertension were significant independent predictors of CHD retirement. Again, age was the strongest predictor, but less so than for CHD retirement (adjusted OR = 7.8, 95% CI = 2–31).

## Discussion

Our study demonstrated several major findings among primarily nonfatal cardiovascular firefighter retirements. First, as expected, in Massachusetts, most Heart Presumption awards were due to CHD; however, an unexpectedly large proportion (23%) was due to

other cardiovascular causes. In particular, isolated hypertension or hypertensive heart disease accounted for 8% of all retirements. Second, firefighters retiring due to CHD compared with those retiring from non-CHD vascular causes, while showing some differences, were similar in terms of their overall cardiovascular risk profiles. Strikingly, we found almost no differences in the risk profiles of firefighters whose retirements were associated with discrete on-duty events in comparison with firefighters whose heart disease manifested off-duty. Fourth, in agreement with our previous study of CHD fatalities among firefighters, we found excess risk for on-duty events strongly associated with fire suppression and alarm response. Fifth, as expected, the retirees had much higher prevalences of cardiovascular risk factors compared with professionally active control firefighters. Taken together, our findings suggest that certain firefighting activities increase the risk of a cardiovascular event in susceptible firefighters. For the most part, however, heart retirements among Massachusetts firefighters most likely result from an excess of personal cardiovascular risk factors among older firefighters, and over half were unrelated to specific on-duty events. Thus, the current descriptive study supports the need for cardiovascular prevention and risk reduction strategies among Massachusetts firefighters in agreement with previous conclusions.<sup>1–3,5,20</sup>

Major cardiovascular risk factors are detectable at routine examinations and mostly modifiable. However, most fire departments do not require firefighters to exercise regularly, and they also do not require periodic medical examinations or physical fitness testing. This is clearly the case in Massachusetts where a 2004 NFPA survey determined that 89% of the state's firefighters work in departments with no program to maintain basic health and fitness.<sup>21</sup> One obstacle to the testing of veteran firefighters is that some believe it discrim-

**TABLE 4**  
CHD Retirements versus Active Firefighters (controls)

	CHD Retirements (n = 277) Percent (n)	Active Firefighters (n = 310) Percent (n)	Odds Ratio (95% confidence interval) Multivariate Odds Ratio* (95% confidence interval)
Age ≥45 yr	94 (261)	21 (64)	63 (35-111) 52 (19-139)
Current smoking	30 (76)	10 (31)	3.9 (2.5-6.2) 2.9 (1.3-6.3)
Hypertension	59 (141)	21 (65)	5.4 (3.7-7.9) 1.2 (0.6-2.4)
Diabetes mellitus	26 (62)	3 (8)	13 (6.1-28) 5.0 (1.7-15)
Cholesterol ≥5.18 mmol/L (200 mg/dL)	80 (169)	63 (196)	2.4 (1.6-3.6) 0.8 (0.4-1.6)
Prior diagnosis of CHD	22 (48)	1 (3)	30 (9.1-96) 8.8 (1.9-41)
Obesity, body mass index ≥30 kg/m <sup>2</sup>	41 (98)	34 (104)	1.4 (0.96-1.9) 0.7 (0.3-1.3)

\*Multivariate analyses adjusted for all listed predictors.  
CHD indicates coronary heart disease.

**TABLE 5**  
Non-CHD Retirements versus Active Firefighters (controls)

	Non-CHD Retirements (n = 84) Percent (n)	Active Firefighters (n = 310) Percent (n)	Odds Ratio (95% confidence interval) Multivariate Odds Ratio* (95% confidence interval)
Age ≥45 yr	87 (72)	21 (64)	26 (13-51) 7.8 (2.0-31)
Current smoking	22 (13)	10 (31)	2.5 (1.2-5.1) 2.9 (0.6-14)
Hypertension	75 (55)	21 (65)	11 (6.1-20) 4.8 (1.3-18)
Diabetes mellitus	17 (10)	3 (8)	7.7 (2.9-20) 4.3 (0.7-28)
Cholesterol ≥5.18 mmol/L (200 mg/dL)	65 (22)	63 (196)	1.1 (0.51-2.24) 1.3 (0.3-5.5)
Obesity, body mass index ≥30 kg/m <sup>2</sup>	66 (41)	34 (104)	3.6 (2.0-6.4) 2.9 (0.8-11)

\*Multivariate analyses adjusted for all listed predictors.  
CHD indicates coronary heart disease.

inates against older firefighters. Such practices preventing periodic testing, however, result in exposing firefighters who are no longer fit to the risk of disability injury and death.<sup>5</sup> In our study, in comparisons with control firefighters, age was the strongest independent predictor of disability retirement even after adjustment for all

other cardiovascular risk factors. This supports that physical abilities, fitness, and medical testing results should not be age-adjusted.

Another indicator from the current study that fitness standards for incumbent firefighters are lacking is that almost half (46%) of those receiving a pension were obese by

body mass index criteria. Other investigations document that major problems with obesity in the fire service begin long before retirement. We previously reported a 33% prevalence of obesity among the professionally active control firefighters,<sup>14</sup> which increased to 40% 4 years later.<sup>15</sup> Similar cross-sectional results were also observed in a Texas cohort.<sup>22</sup> Additionally, Womack et al<sup>23</sup> found that both exercise tolerance and lean body mass were below age-predicted averages in another firefighter cohort. Furthermore, Roberts et al<sup>24</sup> demonstrated that even new firefighter recruits were overweight and had low-normal aerobic capacities. Therefore, fitness promotion, including nutrition and exercise programs, should be widely promoted and provided by fire service authorities.

Smoking, hypertension, hypercholesterolemia, and prevalent CHD were also quite common among the retirees in this study. The high prevalence of smoking among those receiving Heart Presumption retirements supports Massachusetts law, which has since 1988 prohibited new firefighters from smoking.<sup>25</sup> The high rates of hypertension and hypercholesterolemia were not surprising. We have previously shown that hypertension and dyslipidemia are often inadequately treated among professionally active Massachusetts firefighters and that uncontrolled hypertension is associated with a higher risk of adverse changes in employment status.<sup>15-17</sup> Therefore, we believe that risk factor screening alone is insufficient, and fire department medical programs should include incentives to promote more aggressive risk factor reduction. These should include measures for progressively controlling hypertension,<sup>17,26</sup> which is a treatable illness yet one whose failure to control accounted for almost 10% of heart retirements and most likely contributed to others.

We found that fire suppression accounted for 43% of on-duty events leading to retirement, which is remarkable because fire suppression

may only represent 2% or less of a firefighter's yearly duties. The most likely explanation for the highly elevated event risk compared with that of nonemergency duty is the increased cardiovascular demands of fire suppression.<sup>27-30</sup> Also in agreement with a triggering hypothesis and earlier research documenting increased heart rates in firefighters responding to alarms,<sup>27,31</sup> we found a 6.4-fold increase in the relative risk of a cardiovascular event during alarm response. Heart rate and blood pressure increase in response to alarms consistent with fight or flight physiology and remain elevated in unfit firefighters.<sup>32</sup> In addition, firefighters can be exposed to significant noise from truck sirens during alarm response, also increasing blood pressure. Our relative risk estimates for both fire suppression and alarm response with respect to heart retirements were quite similar to the magnitude of risk we previously observed for these two firefighting activities among on-duty CHD fatalities.<sup>5</sup>

We acknowledge several limitations regarding our study. First, it was retrospective in nature and, second, it was based on review of nonuniform medical documentation supporting each retirement. Heart Presumption and other cardiovascular retirements in Massachusetts are not required to undergo a standard battery of anthropometric, metabolic, cardiovascular, and exercise testing to apply for disability. If such a system had existed, it would have provided more information regarding the health and risk factor status of these firefighters, would have eliminated most missing data, and improved comparisons among different groups of retirees. We also know that second jobs are common among firefighters, but information regarding possible exposures from nonfirefighting jobs was not available for the retirees or control firefighters. It is unclear, however, how this limitation, present in almost all studies of firefighters, might have affected the results, if at all. Third, our results characterize primarily

nonfatal heart retirements. Firefighter heart deaths are often approved for awards at the local, municipal retirement board level and are not required to undergo medical review by PERAC. These are mostly deaths occurring off-duty or subsequent to retirement for another reason as well as a few on-duty heart deaths. Two (<1%) of our cases were on-duty fatalities. Six more on-duty heart fatalities occurred among Massachusetts professional firefighters from 1997 to 2004 according to FEMA and U.S. Fire Administration records.<sup>2,33</sup>

Our study also had many strengths. First, this is the only systematic study of Heart Presumption retirements that we know of, although such legislation covers most of North America. Second, we had access to information on all of these retirements with medical reviews for an 8-year period. Third, our estimation of relative risks for specific job activities was done using incident and response data from an urban Massachusetts fire department, which was likely to be representative of Massachusetts firefighters. Because we hypothesized that strenuous emergency activities carry the highest risks of CHD death, we sought an urban fire department to ensure a sufficient level of emergency incidents. To the extent that using an urban professional department to estimate the frequency of job activities and emergency responses resulted in overestimates of the extent of fire suppression and other emergency activities for suburban and rural firefighters, this would have biased our results toward the null hypothesis. Fourth, our control (professionally active) firefighters also represented all regions of Massachusetts, and their examinations were fully standardized. Therefore, the groups were comparable for region and occupation. Additionally, there was a strong predisposition to determine all prevalent risk factors present among the controls through their comprehensive examinations,

which again biased our results toward the null hypothesis and made our design more conservative.

## Conclusions

We described 362 firefighters receiving cardiovascular retirements in Massachusetts over an 8-year period. Approximately 75% of retirements were attributed to CHD and less than one half were associated with specific duty-related events. Regardless of the type of heart disease and whether their retirement was duty-associated or manifested off-duty, all of these subgroups were remarkable for a high prevalence of classic and mostly treatable, cardiovascular risk factors, which were significantly higher than those found among professionally active control firefighters. The current study, although limited to Massachusetts, strongly supports previous calls for improved cardiovascular prevention and risk reduction strategies among firefighters.<sup>1-3,5</sup> We encourage further investigation by researchers elsewhere in North America to determine if the current results from Massachusetts regarding Heart Presumption retirements are typical.

## Acknowledgments

JDH was responsible for data extraction, performed chart reviews of firefighter retirees, supervised database management, performed analyses, and was responsible for primary manuscript preparation and revision. LS assisted with data entry, database management, and data analyses. LP was responsible for all multivariate analyses and statistical oversight. JB assisted with obtaining funding and data access and contributed to manuscript revision. SNK conceived the study, obtained funding, supervised all aspects of the project, and was instrumental in manuscript preparation and revision. Special thanks to the Public Employee Retirement Administration Commission (PERAC) Commissioners; Joseph E. Connarton, Executive Director of PERAC, Kevin Blanchette, Barbara Lagorio, Mary Jane Carritte, Katherine Hogan, and Paul Laliberte.

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