Legislative Report Prepared for The Joint Legislative Audit Committee in Compliance with ARS 23-1102 through 23-1104 Regarding the Addition of Cardiac Presumption Legislation

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Cardiac presumption legislation to protect firefighters and peace officers is currently non-existent in Arizona. Heart or cardiovascular disease is the most frequent cause of duty related mortality of firefighters (Heart Disease In The Fire Service, 2013). In addition, for every fatal on duty heart disease event there are an estimated 17 non-fatal line of duty heart related events in the United States (Karter and Molis, 2005). There are known links between the profession and higher rates of cardiac issues as demonstrated by the research findings in this report. In fact, 37 of the 50, states have cardiac presumption legislation (IAFF, 2016). The purpose of this report is to add cardiac presumption legislation in Arizona based on research that links firefighting with increased rates of cardiovascular disease.

ARS 23-1102. Workers' compensation presumptions of compensability; report
A person that advocates a legislative proposal shall submit a report to the joint legislative audit committee as prescribed in this article, if the legislative proposal if enacted would do either of the following:
1. Mandate that an insurer or self-insured employer deem that a disease or condition has arisen out of employment, including establishing a presumption of compensability.
2. Substantially modify a statute that establishes a presumption of compensability for a disease or condition.

23-1103 A. The report shall include all of the following:
1. Scientific evidence that shows the extent to which:
(a) Peer reviewed scientific studies exist that document a causal relationship that a specific disease or condition has been demonstrated to have arisen out of employment.

Guidotti and Brandt-Rauf (1995) conducted an extensive literature review to study disease risk among firefighters to infer magnitude of risk. Based on the criteria for presumption of occupational risk accepted in most worker's compensation claims, the standard mortality rate (SMR) of 200 is equal to an attributable 100% of expected claims, they concluded that fatal arrhythmia, or myocardial infarction, occurring on or soon after near-maximal stress on the job are likely to be work-related.

Kale et. al. (2003) study entitled: *Firefighters and on duty deaths from coronary heart disease: a case control study,* confirmed Guidott's findings. Moreover, the researchers conclude that other symptoms that generate cardiovascular arousal are caused by work events and are work related.

Kale et al. (2007) followed up their previous research with additional research entitled *Emergency duties and deaths from heart disease among firefighters in the United States.* This research focused on several typical duties in the occupation of firefighting: fire suppression, training, alarm response, and strenuous physical activity. In each research question, statistically significant relationships were identified, which linked the occupation with fatal heart attacks. Compared with the odds of death from coronary heart disease during nonemergency duties, the odds were **12.1 to 136 times as high** during fire suppression, **2.8 to 14.1 times as high** during alarm response, **2.2 to 10.5 times as high** during alarm return, and **2.9 to 6.6 times as high** during physical training. The research concluded that "taken together these findings suggest that fatal heart attacks suffered by fire fighters while on duty are work related".

(b) The centers for disease control and prevention have determined that a disease or condition is acquired or transmitted.

Numerous studies have determined that strenuous physical activity, emotional stress, and environmental pollutants exacerbate underlying cardiac problems in the general population. Moreover, firefighters demonstrate a sympathetic 'fight or flight' type of stress in reaction to emergency alarms (Kuorinka, 1981), have an increase link to cardiac disease due to their shift work and long hours (Steenland, 2000), and are exposed to further occupational threats to their cardiac health from use of personal protective wear and heat stress (Smith et al, 2015).

The NIOSH Alert (2007) explains that over 75% of heart events take place at an incident, during training, or traveling to or from an incident. Furthermore, "These activities are known to produce high heart rates and elevated blood pressures, which can be attributed to alarm response or performing physically demanding tasks" (NIOSH Alert, 2007, p. 14).

Additionally, research findings reported by Kale et. al. (2007) in relation to the circadian patterns of heart disease show a link that differentiates firefighters from the general population. In stark contrast to the general population, where heart events peak in the morning, over two thirds of line of duty heart deaths occur between the hours of noon and midnight. This timing mirrors the pattern of emergency alarms and dispatches and provides strong support of the link between firefighting and cardiac events.

(c) Alternative exposure patterns exist for acquiring or transmitting a disease or condition other than occupational.

The standardized mortality ratio (SMR) is often used to compare rates of death between populations. For firefighters studies have been conducted that compare the ratio of the number of deaths for firefighters to the deaths in the reference or comparison group. Roenstock and Olsen (2007) in *Firefighting and death from cardiovascular causes* report two main findings: first, that CVD or heart disease accounts for 35% of firefighter deaths which is similar to the general population. Second, coronary heart disease is .9 to 10% less in firefighters. Haas et al. (2003) conducted a review of the mortality studies that reported SMRs for firefighters and concluded that the healthy work effect may be masking actual differences in CVD mortality among firefighters. Choi's (2000) research entitled *A technique to re-assess epidemologic evidence in light of the healthy worker effect: The case of firefighting and heart disease* estimates that the healthy worker effect may reduce the overall death rates to 80% of the rate in a reference population.

2. Financial information to indicate the extent to which:
The mandate may cause an employer or insurance carrier to pay a workers' compensation claim for a nonwork related disease or condition.

Alternative exposure patterns for cardiovascular disease exist for acquiring the disease and conditions associated with it. For example, there is a casual link between smoking tobacco and the risk of heart disease (Roger et al., 2011). Protection measures will be built in that limit the presumption to those firefighters and peace officers who have not used tobacco products for the previous year. Several aspects of this proposed cardiac presumption legislation will be aligned with and mirror the current cancer presumption legislation, which states that all the following requirements must be met: the firefighter or peace officer must have a physical exam was done prior to employment, have worked at least five years, and be sixty-five years of age or younger. The presumption is nullified if the individual used tobacco products within the previous year and the presumption only applies to full time employees (under subsection B, paragraphs 1-3, subdivisions c, d, e, and definitions 1 and 2). These requirements guard against the employer paying a worker's compensation claim for a nonwork related disease or condition.

Furthermore, law requires that anyone who uses a self contained breathing apparatus (SCBA) follow the National Fire Protection Administration (NFPA) guidelines on medical fitness. NFPA 1582 mandates an initial pre-hire medical, physical fitness, and emotional fitness

examination and annual examinations thereafter to be in compliance (Angel, 2008). There are specific requirements for cardiovascular fitness and the first responders receive a 'tier' rating. When health issues are detected the individual is placed on alternative duty to improve their tier ranking to the acceptable level of fitness and will not be released until they are considered 'fit for duty'. The medical examination includes: a health risk appraisal, a hands-on physical exam including vital signs, pulmonary function test, hearing test, blood chemistry lab tests, and specific cardiopulmonary and cardiovascular assessments. All of these measures help guard against firefighter injury and death, ensure the highest level of service to citizens, as well as protect insurance carriers from paying a worker' compensation claim for nonwork related health issues.

(b) The mandate may increase costs to self-insured employers or premiums charged by insurance carriers.

Quantifying the cost of adding the cardiac presumption is difficult. However, the National Council on Compensation Insurance Incorporated (NCCI) (2014) states "due to the physical exertion and stress associated with the firefighting profession, heart-related injuries may already have been compensated through general WC compensability standards, and an impact to workers compensation costs may therefore be less prominent in this disease category than in other disease categories" (p. 8). There is no hard evidence that there would be significant cost increases for implementing presumptive legislation.

3. An explanation of why existing compensability methods are inadequate to accurately determine if a disease or condition is acquired or transmitted in the course of employment.

Existing compensability methods are inadequate to accurately determine if cardiovascular disease is acquired over the course of employment due to the nature and variables that develop into the disease. Although a heart attack may be tied to a single point in time often the latent nature of disease process differ. The frequency and level of exposure to aggravating factors impact the manifestation of cardiovascular disease over the course of a career. Disease has a slower process and it is more challenging to pinpoint the exact exposure that caused the ultimate life threatening incident. It is more likely that the combination of multiple factors over the course of a career lead to cardiovascular disease.

B. The report shall address the specific language of the legislative proposal.

The proposed cardiac presumption should be aligned with and mirror the current presumption cancer legislation.

23-901.01. Occupational disease; proximate causation; exceptions; definitions

A. The occupational diseases as defined by section 23-901, paragraph 13, subdivision (c) shall be deemed to arise out of the employment only if all of the following six requirements exist:

1. There is a direct causal connection between the conditions under which the work is performed and the occupational disease.

2. The disease can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment.

3. The disease can be fairly traced to the employment as the proximate cause.

4. The disease does not come from a hazard to which workers would have been equally exposed outside of the employment.

5. The disease is incidental to the character of the business and not independent of the relation of employer and employee.

6. The disease after its contraction appears to have had its origin in a risk connected with the employment, and to have flowed from that source as a natural consequence, although it need not have been foreseen or expected.

B. Notwithstanding subsection A of this section and section 23-1043.01, any disease, infirmity or impairment of a firefighter's or peace officer's health that is caused by brain, bladder, rectal or colon cancer, lymphoma, leukemia or aden carcinoma or mesothelioma of the respiratory tract and that results in disability or death is presumed to be an occupational disease as defined in section 23-901, paragraph 13, subdivision (c) and is deemed to arise out of employment. The presumption is granted if all of the following apply:

1. The firefighter or peace officer passed a physical examination before employment and the examination did not indicate evidence of cancer.

2. The firefighter or peace officer was assigned to hazardous duty for at least five years.

3. The firefighter or peace officer was exposed to a known carcinogen as defined by the international agency for research on cancer and informed the department of this exposure, and the carcinogen is reasonably related to the cancer.

C. NOTWITHSTANDING SUBSECTION A OF THIS SECTION AND SECTION 23-1043.XX, ANY DISEASE, INFIRMITY OR IMPAIRMENT OF A FIREFIGHTER'S OR PEACE OFFICER'S HEALTH THAT IS CAUSED BY HEART DISEASE OR INJURY, ACUTE MYOCARDIAL INFARCTION OR STROKE, HYPERTENSION OR CARDIOVASCULAR OR PULMONARY DISEASE AND THAT RESULTS IN DISABILITY OR DEATH IS PRESUMED TO BE AN OCCUPATIONAL DISEASE AS DEFINED IN SECTION 23-901, PARAGRAPH 13, SUBDIVISION (c) AND IS DEEMED TO ARISE OUT OF EMPLOYMENT. THE PRESUMPTION IS GRANTED IF ALL OF THE FOLLOWING APPLY:

1. THE FIREFIGHTER OR PEACE OFFICER PASSED A PHYSICAL EXAMINATION BEFORE EMPLOYMENT AND THE EXAMINATION DID NOT INDICATE EVIDENCE OF HEART DISEASE OR INJURY, ACUTE MYOCARDIAL INFARCTION OR STROKE, HYPERTENSION OR CARDIOVASCULAR OR PULMONARY DISEASE.

2. THE FIREFIGHTER OR PEACE OFFICER WAS ASSIGNED TO HAZARDOUS DUTY FOR AT LEAST FIVE YEARS.

3. THE FIREFIGHTER OR PEACE OFFICER WAS EXPOSED TO A KNOWN EVENT WITHIN TWENTY-FOUR HOURS OF THE EVENT, AND THE EVENT IS REASONABLY RELATED TO THE HEART DISEASE OR INJURY, ACUTE MYOCARDIAL INFARCTION OR STROKE, HYPERTENSION OR CARDIOVASCULAR OR PULMONARY DISEASE.

D. SUBSECTIONS B AND C of this section APPLY to former firefighters and peace officers who are sixty-five years of age or younger.

E. Subsection B of this section does not apply to cancers of the respiratory tract if the firefighter or peace officer has smoked tobacco products.

F. SUBSECTION C OF THIS SECTION DOES NOT APPLY TO HEART DISEASE OR INJURY, ACUTE MYOCARDIAL INFARCTION OR STROKE, HYPERTENSION, CARDIOVASCULAR OR PULMONARY DISEASE IF THE FIREFIGHTER OR PEACE OFFICER HAS SMOKED TOBACCO PRODUCTS DURING THE YEAR BEFORE THE HEART DISEASE OR INJURY, ACUTE MYOCARDIAL INFARCTION OR STROKE, HYPERTENSION, CARDIOVASCULAR OR PULMONARY DISEASE.

G. For the purposes of this section:

1. "Firefighter" means a full-time firefighter who was regularly assigned to hazardous duty.

2. "Peace officer" means a full-time peace officer who was regularly assigned to hazardous duty as a part of a special operations, special weapons and tactics, explosive ordinance disposal or hazardous materials response unit.

C. A person that does not submit a report as prescribed in this article is not subject to any civil sanction or criminal penalty.

23-1104. Report procedures and deadlines

A report must be submitted to the joint legislative audit committee on or before September 1 before the start of the legislative session for which the legislation is proposed. The joint legislative audit committee shall assign the written report to the appropriate legislative committee of reference established pursuant to section 41-2954. The legislative committee of reference shall hold at least one hearing and take public testimony after receiving the report. The legislative committee of reference shall study the written report and deliver a report of its recommendations to the joint legislative audit committee, the speaker of the house of representatives, the president of the senate, the governor and the commission on or before December 1 of the year in which the report is submitted.

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