

FINAL AWARD ALLOWING COMPENSATION
(Reversing Award and Decision of Administrative Law Judge)

Injury No.: 12-086272

Employee: Dennis O'Brien
Employer: ConAgra Foods Packaged Foods, LLC
Insurer: Old Republic Insurance Company
Additional Party: Treasurer of Missouri as Custodian
of Second Injury Fund

This workers' compensation case is submitted to the Labor and Industrial Relations Commission (Commission) for review as provided by § 287.480 RSMo. We have reviewed the evidence, read the briefs, heard the parties' arguments, and considered the whole record. Pursuant to § 286.090 RSMo, the Commission reverses the award and decision of the administrative law judge.

Preliminaries

The parties asked the administrative law judge to resolve the following issues: (1) whether employee sustained an accident or occupational disease arising out of and in the course of the employment on or about November 4, 2012; (2) whether the accident or occupational disease is the prevailing factor in the cause of any or all of the injuries and/or conditions alleged in the evidence; (3) employer's liability, if any, for permanent partial disability benefits; (4) employer's liability, if any, for temporary total disability benefits for the period of November 5, 2012, through April 12, 2013; (5) employer's liability, if any, to reimburse employee for past medical expenses; (6) employer's liability, if any, for any future medical benefits pursuant to § 287.140 RSMo; and (7) the liability, if any, of the Second Injury Fund for permanent partial disability benefits.

The administrative law judge concluded as follows: (1) employee's occupational exposure was not the prevailing factor in the cause of employee's cardiac arrest; and (2) employee did not sustain a compensable accident or a compensable occupational disease.

Employee filed a timely application for review alleging the administrative law judge erred because the overwhelming weight of the evidence supports a finding that employee's occupational exposure was the prevailing factor in causing his cardiac arrest.

For the reasons set forth below, we reverse the award and decision of the administrative law judge.

Findings of Fact

Employee works in employer's food processing facility performing mechanical and electrical maintenance duties. He seeks workers' compensation benefits in connection with a cardiac arrest he suffered at employer's facility on November 4, 2012, after working for two days in a boiler room where a toxic chemical had been aerosolized from a leaking pipe.

Employee: Dennis O'Brien

- 2 -

Employee's date of birth is November 30, 1968. Employee smoked about a pack of cigarettes per day for 23 years. In September 2003, employee sought treatment for progressively worsening shortness of breath on exertion. A CT scan suggested employee was suffering from superior vena cava syndrome.¹ An interventional angiography of September 11, 2003, revealed an occlusion of the superior vena cava; subsequent CT and ultrasound studies of the chest confirmed this diagnosis. On April 21, 2004, Dr. Imad Shawa diagnosed possible fibrosing mediastinitis² related to histoplasmosis,³ and prescribed Sporanox.

On October 19, 2005, Dr. Richard Schmaltz performed a superior vena cava venogram in an attempt to place a stent at the area of obstruction, but this procedure was not successful. So, on November 8, 2005, Dr. Normand Caron performed an open heart surgery including a superior vena cava bypass with saphenous vein graft. For about a year after the surgery, employee took Plavix, a blood thinning medication. Thereafter, employee took no prescription medications for his heart. Employee returned to his full-duty, full-time work with employer, but was unable to qualify for the hazmat team,⁴ because he failed the lung function portion of the physical examination.

In April 2009, employee went to the emergency room complaining of left-sided chest pain, shoulder pain, nausea, weakness, and shortness of breath. An ECG revealed a left bundle branch block.⁵ In February 2011, employee again sought treatment for a history of shortness of breath and chest pains. A cardiac MRI revealed a severely dilated left ventricle with a 30 to 35% ejection fraction.⁶ In contrast, a subsequent heart catheterization of March 2011 suggested a 53% ejection fraction.⁷

Occupational exposure

On November 2, 2012, employee's coworker, Loren Kidder, noticed a strong, unusual smell while running conduit in employer's boiler room, so he called a boiler mechanic to help locate the origin. The mechanic found a leaky valve in a pipe, through which the industrial chemical Coravol 1973 (hereinafter "coravol") was spraying into the room. Coravol is composed of 20% cyclohexamine, 5 to 20% morpholine, and water, and is used by employer to prevent corrosion within the boiler systems. The Material Safety

¹ The parties did not ask their medical experts to explain vena cava syndrome. As best we can determine from the record, this condition appears to have involved an occlusion of an artery located in employee's chest.

² Mediastinitis is an inflammation of the mediastinum, i.e., the center of the chest, and involves narrowing or occlusion of blood vessels preventing the flow of blood from the head and upper torso back to the heart, resulting in swelling and headache.

³ The parties did not ask their medical experts to explain histoplasmosis. As best we can determine from the record, this condition appears to involve pulmonary inflammation, possibly linked to employee's childhood exposure to chickens.

⁴ Employer's hazmat team responds to chemical spills in the facility, repairing leaks and rescuing any individuals exposed to toxic materials.

⁵ A left bundle branch block is an abnormal finding indicating that the electrical impulses regulating the contraction of the heart muscles have been compromised, typically owing to underlying heart disease.

⁶ Ejection fraction refers to the amount of blood that is pumped out of the heart with each contraction, or beat of the heart. A normal ejection fraction is 55 to 70%.

⁷ The medical experts who testified in this case generally agreed that the prior cardiac MRI may have been the more accurate study.

Employee: Dennis O'Brien

- 3 -

Data Sheet (MSDS) for coravol warns against inhalation of the substance in vapor or mist form; states that the substance is corrosive to the respiratory system and can burn the respiratory tract; recommends the use of protective equipment, including an appropriate respirator; and recommends immediate medical attention if inhaled. In addition, the medical experts who testified in this case agreed that the cyclohexamine contained in coravol has a stimulant activity upon the heart that can cause elevated heart rates and arrhythmia.

The mechanic who responded to Mr. Kidder's inquiry on November 2, 2012, turned off the valve through which the coravol was leaking. However, when employee joined Mr. Kidder in the boiler room at about 8:30 a.m. on November 3, 2012, the two immediately noticed a strong, pungent smell.⁸ They investigated and discovered that the valve had begun leaking again, producing a constant spray of mist and liquid. An electrical panel had been blackened by exposure to the leaking coravol, and the concrete floor under the leak had been pitted and burned. Mr. Kidder again called a mechanic to address the issue. The mechanic put a bucket under the leak, then left to find parts to fix it.

Employee and Mr. Kidder had to perform much of their work within close proximity to the leak, as they were running wires to the unit that regulated the flow of coravol into the steam system. It was over 100 degrees Fahrenheit in the boiler room that day, and the work of running conduit and pulling wires was rather strenuous. While performing these duties on November 3, 2012, Mr. Kidder began to experience a headache, burning sinuses, and a raw/scratchy throat. Employee also suffered from a sore throat and burning sinuses, as well as an upset stomach. Owing to these symptoms and the strong and unpleasant smell of the coravol fumes, the two took a number of short breaks to go outside and get some fresh air. (These breaks were in addition to the two 15 minute breaks and 30 minute lunch break employer typically allowed.) At some point later in the day, a mechanic returned and shut off the valve supplying coravol to the steam system, but this did not occur until long after employee and Mr. Kidder had felt the effects of the fumes. Mr. Kidder and employee finished their work in the boiler room between 8:00 and 8:30 p.m. on November 3, 2012.

That night, employee was unable to eat his dinner owing to an upset stomach. The next morning, employee felt a little better, but his throat was scratchy and his sinuses remained sore. Though employee and Mr. Kidder had reported the leaking coravol, employer did not provide them with respirators, as recommended by the MSDS, or any other protective equipment to minimize the effects of the coravol fumes. Nor did employer send them to receive immediate medical attention, as recommended by the MSDS. Nor did employer have anyone fix the valve from which the coravol was leaking. Instead, employer sent employee and Mr. Kidder back into the boiler room.

⁸ We find the consistent testimony from employee and Mr. Kidder regarding their start time on November 3, 2012, to be more persuasive than any contrary indication from Exhibit 18, which appears to consist of computerized time records from employer. There was no testimony from any custodian of such records or any other witness to explain how Exhibit 18 was created, stored, or retrieved.

Employee: Dennis O'Brien

- 4 -

On November 4, 2012, employee and Mr. Kidder resumed their work in the boiler room at about 8:30 a.m. About three hours later, the strong smell of coravol returned. Once again, Mr. Kidder called a mechanic, who determined the leak was too serious to fix without shutting down the entire boiler system. For unknown reasons, this was not immediately done. Instead, employee and Mr. Kidder continued to work in the boiler room near the coravol leak. They again took periodic breaks to leave the boiler room and get fresh air, but continued to suffer the symptoms they'd experienced the previous day. Employee additionally developed a headache. At some point, the leak got worse and began spraying about 15 feet into the air. Because of this, and because the two felt they could no longer withstand the symptoms they attributed to inhaling the coravol fumes, they stopped working around 6:00 p.m., and left the boiler room, returning only briefly to retrieve their tools.⁹

It is unclear what employee did in the period between 6:00 p.m. and 8:40 p.m., as he has no memory of this time period, and there is no other evidence on the record to establish his whereabouts or activities. At approximately 8:40 p.m., employee appeared in the nurse's station on employer's premises, and asked to see the MSDS for coravol. He also requested Tylenol for his headache. Thereafter, employee visited a coworker, Chris Townlain, who had asked employee to show him something on the computer. Employee sat down in an office and waited for Mr. Townlain to return from other duties. At some point, employee fell out of the chair, and at around 9:00 p.m., his coworkers discovered him on the floor. Employee was not breathing, and had no pulse. Fortunately, there was a defibrillator machine available on employer's premises, and through the efforts of employee's coworkers, who performed CPR and administered the defibrillator, employee's heart started beating again before emergency medical personnel arrived.

Medical treatment

Emergency personnel first transported employee to Fitzgibbon Hospital, where attending physicians diagnosed a cardiac arrest and stabilized his condition. Employee was then transported by helicopter to Boone Hospital Center, where he remained in a coma for four days. Treating physicians intubated employee, and he required mechanical ventilation during his early hospitalization. He was placed on an Amiodarone drip for ventricular tachycardia, and managed with hypothermic protocol. With these measures, employee began to improve gradually.

Initial echocardiograms revealed a global cardiomyopathy with an ejection fraction of about 12%, which improved to about 20% on subsequent studies. On November 15, 2012, Dr. Joss Fernandez attempted a superior vena cava angioplasty, but this was unsuccessful. On November 16, 2012, Dr. Fernandez performed an implantation of a transatrial biventricular pacemaker via a right anterior thoracotomy. Thereafter, employee saw Dr. Fernandez and his cardiologist, Dr. John Baird, for numerous follow-up visits; underwent testing and monitoring of his gradually improving condition; and completed a full course of cardiac rehabilitation therapy.

⁹ Employee conceded he has little memory of when he and Mr. Kidder stopped working in the boiler room on November 4, 2012, so we have relied upon Mr. Kidder's testimony in rendering these findings.

Employee: Dennis O'Brien

- 5 -

Employee's medical records reflecting the above treatments are in evidence. In addition, at the hearing before the administrative law judge, employee identified Exhibit 16 as consisting of the medical bills he received from Boone Hospital Center. Those bills reflect total charges of \$242,071.49 for services provided between November 4, 2012, and December 26, 2012. However, in his brief, employee claims only \$232,840.49 of this amount, which correlates to charges for services provided between November 4, 2012, and November 19, 2012.

Employee also submitted, at the hearing, a bill from Neurology, Inc., for an evaluation of February 11, 2013, to look into some apparent short-term memory problems employee suffered after the cardiac arrest of November 4, 2012. This bill, set forth in Exhibit 14, suggests employee incurred total charges of \$457.00 for this evaluation. However, employee did not identify this bill, in his testimony, as having been incurred in connection with treatment related to the work injury. Employee's brief does not request reimbursement of these expenses, and instead (as we have noted) seeks only the amount of \$232,840.49 in charges from Boone Hospital Center for services provided between November 4, 2012, and November 19, 2012.

Where employee seeks less than the total charges that the submitted bills would suggest he incurred, we will not second-guess him with regard to the claimed amount of his past medical expenses. Accordingly, we find employee incurred \$232,840.49 in disputed charges for medical expenses required to cure and relieve the effects of his cardiac arrest on November 4, 2012.

Future medical treatment

According to employee's understanding, his pacemaker will require periodic monitoring from a physician, and runs on batteries that must be replaced every few years. Employee's medical expert, Dr. David Volarich, also recommends that employee receive lifelong surveillance for his cardiac disease, and notes that he now requires daily medications. However, Dr. Volarich did not express, in his report or at his deposition, any opinion that such need for ongoing treatment/surveillance is a result of the claimed work injury. Nor did Dr. Volarich offer an opinion whether employee has a need for any other future medical treatment flowing from the effects of employee's claimed work injury.

Employee also presented the expert medical testimony of Dr. Jerrold Leikin, but Dr. Leikin did not express any opinion, in his report or at his deposition, with regard to the issue of future medical treatment. Accordingly, owing to the scant evidence with regard to the issue of future medical treatment, we decline to make a finding that any need for future medical treatment flows from the effects of the claimed work injury.

Nature and extent of disability

During a visit on December 26, 2012, employee advised Dr. Fernandez that he was worried about staying off work. However, Dr. Fernandez advised him to apply for short-term disability so that he could continue to rest and recover. Ultimately, employee's doctors kept him off work from the date of his hospitalization on November 4, 2012, until April 12, 2013, upon which employee returned to work.

Employee: Dennis O'Brien

- 6 -

Since his recovery, employee's endurance has been reduced, and he gets winded more easily. For example, employee must stop and rest if he makes a trip across employer's plant. Employee is no longer able to work 7 days per week, as he did before suffering the cardiac arrest; instead, employee works a maximum of 6 days per week. Employee must regularly visit employer's nurse station to have his blood pressure checked, and is not permitted to work alone in remote areas of the plant. Employee's supervisor requires that employee check in with him every 2 hours to ensure employee is okay.

Additionally, employee must observe certain restrictions on work activities that may interfere with the function of his pacemaker. For example, employee can no longer weld, work around transformers on employer's premises, or be in any areas where significant electromagnetic forces are present.

Subsequent investigation

Donald Van Buskirk, employer's boiler/refrigeration technician, confirmed that the substance leaking into the boiler room on November 3 and 4, 2012, was coravol. Mr. Buskirk explained that the coravol is pumped into the steam system from a 55-gallon drum, and the pump is calibrated to keep the concentration level of coravol within the system at 10 parts per million. Mr. Van Buskirk personally performs the testing to determine the concentration of coravol in the steam system. However, in the week prior to employee's occupational exposure to the leaking coravol, Mr. Van Buskirk was on vacation, and thus unable to perform such testing and the coravol was not tested in his absence. On November 6, 2012, Mr. Van Buskirk repaired the valve from which the coravol was leaking; Mr. Van Buskirk explained that the leak wasn't repaired earlier because, although there were other individuals with employer who should have known how to fix the leak, he was the only employee with experience in fixing such leaks. Although Mr. Van Buskirk could have done so on November 6, 2012, no one with employer instructed him to test the steam or liquid coming from the leak to determine its coravol content, so Mr. Van Buskirk did not perform any such testing.

Instead, employer hired Kenneth White, a certified industrial hygienist, to render an opinion as to the amount of coravol to which employee was exposed. Mr. White visited employer's plant, interviewed Mr. Van Buskirk, investigated the coravol pump and steam system, analyzed the layout and ventilation of the boiler room, and utilized various calculations to arrive at an estimate that the average concentration of cyclohexamine was .72 parts per million while employee and Mr. Kidder were working in the boiler room. Mr. White explained that the American Conference of Governmental Industrial Hygienists (ACGIH) has established an 8-hour time-weighted average of 10 parts per million as the exposure limit for cyclohexamine, meaning that any exposure below this threshold should not be considered dangerous.

On cross-examination, Mr. White conceded he had no way of knowing how much coravol was actually released into the boiler room on November 3 and 4, 2012, and that he instead had to rely on estimations based on the information on the pump that fed the coravol into the piping system, his interview with Mr. Van Buskirk, and his calculations. He also conceded his calculations, which merely provided the *average* concentration of coravol within the boiler room, did not account for the fact that employee was working

Employee: Dennis O'Brien

- 7 -

close to the coravol leak itself, where the concentration would be higher. (Mr. White was unable to testify as to how much higher the concentration would be near the leak.) Finally, Mr. White conceded he was not offering an opinion that the concentration of coravol he identified would not have been sufficient to cause cardiac arrest in someone with employee's preexisting conditions, as that would be in the nature of a medical or toxicological determination that he was unqualified to make. Notably, the record reveals (and we so find) that the 10 parts per million threshold identified by Mr. White is aimed at protecting workers from skin and eye irritation. There is no evidence on this record to suggest the appropriate exposure threshold for an individual, such as employee, with a significantly compromised cardiovascular system.

Expert medical opinion evidence

The medical experts agree that employee suffered from preexisting cardiomyopathy, and that this predisposed him to ventricular arrhythmia¹⁰ of the kind that might cause sudden cardiac arrest. However, they disagree whether employee's occupational exposure to coravol and inhalation of that chemical was the prevailing factor causing employee to suffer the cardiac arrest on November 4, 2012. We are faced with the unenviable task of resolving the competing expert medical opinion evidence in this matter.

As we have noted above, employee presents the expert medical opinion of Dr. Jerrold Leikin, a medical toxicologist. In his report, Dr. Leikin provided the opinion that employee's exposure to cyclohexamine, a component of coravol, was a significant contributing cause and a prevailing factor in causing employee to suffer a cardiac arrest. Dr. Leikin explained that cyclohexamine has a sympathomimetic, or stimulant activity upon the heart that can result in elevated heart rates and arrhythmia. At his deposition, Dr. Leikin further explained that the effect of breathing aerosolized cyclohexamine is similar to injecting adrenaline into the bloodstream, which leads to abnormal heart rhythms.

On cross-examination, Dr. Leikin conceded that, although it appeared to him that employee was exposed to cyclohexamine in excess of the limit recommended by the National Institute of Occupational Safety and Health (NIOSH) of 10 parts per million, he didn't know exactly how much coravol was going through the pipes; where the windows were located in the boiler room; or how much air was being ventilated outside. He also conceded it might be possible to calculate how much coravol was released into the air, if such a study were performed contemporaneous with employee's exposure.¹¹

Dr. Leikin ultimately declined, however—despite a vigorous challenge on this point—to agree that his opinions would change if it were demonstrated that the amount of coravol actually released was less than thresholds recommended by NIOSH. Instead, Dr. Leikin concluded the exact quantity of coravol or cyclohexamine released into the boiler room was unimportant to his ultimate causation opinion, which was premised instead upon employee's actual experience of significant symptoms including

¹⁰ Arrhythmia means an irregular heart rhythm.

¹¹ Dr. Leikin did not review the report from employer's industrial hygienist, Mr. White.

Employee: Dennis O'Brien

- 8 -

headache, sore throat, sinus issues, and taste disturbance concurrent with his exposure, combined with the uncontested fact that employee suffered a cardiac arrest resulting from heart arrhythmias, all of which suggested to Dr. Leikin that employee's occupational exposure was the prevailing factor causing his injury.

Employee also provided the expert medical opinion of Dr. Volarich, who opined in his report that employee's exposure to coravol was the prevailing factor causing development of a near fatal ventricular arrhythmia and cardiac arrest, with a 40% permanent partial disability due to aggravation of employee's preexisting cardiomyopathy. At his deposition, Dr. Volarich conceded on cross-examination that he didn't know the amount of coravol that employee inhaled; the pressure behind the leak; or the amount of the leak. He further conceded that, assuming the coravol was leaking into the room at the lowest threshold whereby it could be smelled (approximately 2.8 parts per million), this would not cause a cardiac event for most people. Dr. Volarich also agreed that at the time of authoring his initial report he did not have the benefit of any of employee's medical records predating November 4, 2012.¹²

Employer, on the other hand, advances the expert medical testimony of Dr. Michael Farrar, a cardiologist, who opined in his report that it is possible that the coravol acted as a triggering factor in causing employee's cardiac arrest on November 4, 2012, given the known sympathomimetic activity of cyclohexamine; but that the prevailing factor causing employee's cardiac arrest was employee's preexisting cardiomyopathy, and that exposure to coravol was not necessary to precipitate the event. At his deposition, Dr. Farrar explained that employee's preexisting heart condition placed him at significant risk for sudden cardiac death at any time, whether at work or otherwise. Dr. Farrar identified employee's preexisting heart disease as nonischemic dilated cardiomyopathy,¹³ a condition that is highly variable but that can lead to the development of congestive heart failure,¹⁴ as well as atrial and/or ventricular arrhythmias. Ventricular arrhythmias can, in severe cases, result in cardiac arrest and sudden cardiac death.

Although Dr. Farrar expressly agreed that cyclohexamine can cause an increase in both heart rate and arterial blood pressure, he declined to characterize employee's prolonged exposure to this aerosolized chemical as a substantial or even a triggering factor in employee's cardiac arrest. On cross-examination, he generally agreed that his theory thus amounts to the assertion that it was mere coincidence that employee suffered a cardiac arrest after two days of prolonged exposure to aerosolized cyclohexamine. Notably, Dr. Farrar was wholly unaware that Mr. Kidder experienced

¹² Employee, however, did provide Dr. Volarich with an oral history of many of his preexisting cardiovascular issues and treatments; and Dr. Volarich later received employee's prior medical records and authored a supplemental report indicating his initial opinions were unchanged, apart from an increase in his rating of preexisting cardiovascular disability.

¹³ Cardiomyopathy is a pathologic enlargement of the heart; as the condition progresses, the heart muscles become weaker. "Nonischemic" means that employee's cardiomyopathy was not related to coronary artery disease. "Dilated" refers to the fact that employee's left ventricle was enlarged.

¹⁴ Employee does not suffer from congestive heart failure.

Employee: Dennis O'Brien

- 9 -

symptoms similar to those experienced by employee after the prolonged exposure to coravol.

Employer also advances the testimony of Dr. Christopher Long,¹⁵ who authored a report opining that it is not reasonable that employee was exposed to any significant amount of coravol, based on the findings of Mr. White, and the absence of any reports from employee of nausea, vomiting, anxiety, drowsiness, or restlessness. At his deposition, Dr. Long conceded that the cyclohexamine found in coravol can produce an epinephrine effect, such as increased heart rate and respiration, but insisted that employee was not exposed to enough coravol to cause that reaction, because (although he ultimately suffered a cardiac arrest) employee didn't report other symptoms of toxicity that Dr. Long might expect, such as eye irritation. Dr. Long also asserted that the particles of coravol spraying from the pipe would have been too large to be absorbed by the lungs, and that it would instead take a chemical explosion to produce particles small enough to affect the body through inhalation.¹⁶

As additional support for his theory that there wasn't enough coravol present in the boiler room to cause any reaction in employee, Dr. Long asserted that Mr. Kidder didn't experience any symptoms at all. When apprised on cross-examination that Mr. Kidder did, in fact, report symptoms of a headache, sore throat, and burning in his nose, Dr. Long suggested that Mr. Kidder must not have been truthful about this, and alluded to prior inconsistent statements from Mr. Kidder.¹⁷ He also conceded that he wasn't aware that employee and Mr. Kidder had taken numerous breaks to get away from the coravol leak owing to the adverse symptoms they were experiencing. Dr. Long further revealed on cross-examination that he had (erroneously) assumed that the temperature in the boiler room was somewhere in the range of 70 to 80 degrees Fahrenheit. He also conceded that he didn't know how far away employee and Mr. Kidder were working from the leaking pipe and that if they were closer to the leak, their exposure would be greater.

In sorting through the conflicting expert testimony in this matter, we first note that it is uncontested that the cyclohexamine contained in the aerosolized coravol to which employee was exposed has a sympathomimetic activity, meaning that the substance stimulates the sympathetic nervous system, or the basic flight or fight response, which in turn increases adrenaline levels, heart rate, and blood pressure. Although employer urges that the testimony from Mr. White and Dr. Long should be accepted as conclusive proof that employee was not exposed to dangerous levels of coravol or cyclohexamine, neither of these witnesses indicated that the regulatory standards they identified would be applicable in the case of an individual, such as employee, with considerable

¹⁵ Dr. Long is not a physician, but rather a PhD forensic toxicologist with the St. Louis University School of Medicine, Department of Pathology.

¹⁶ Dr. Long's testimony that aerosolized coravol particles are too large to be absorbed by the lungs was refuted by the physicians who testified, and would seem to run contrary to the warnings contained on the MSDS; we find it, therefore, unpersuasive.

¹⁷ The record before us does not reveal any materially inconsistent prior statements from Mr. Kidder regarding his symptoms referable to the coravol exposure; in any event, we have credited the testimony from Mr. Kidder that he did experience headache, burning sinuses, and a raw/scratchy throat.

Employee: Dennis O'Brien

- 10 -

preexisting cardiovascular issues. Mr. White, for his part, specifically conceded he was not qualified to testify whether the amount of coravol in the boiler room was sufficient to cause cardiac arrest in someone with employee's preexisting conditions. Nor did Dr. Farrar specifically address this point; instead highlighting the likelihood that employee might have experienced a spontaneous sudden cardiac event at any time. Meanwhile, employee's experts maintained that the exact amount of cyclohexamine emitted into the boiler room was not a necessary component of their causation opinions.

We acknowledge that this is a factually complex case. Ultimately, though, and after much careful consideration, we are most persuaded by the causation opinion provided by Dr. Leikin. Therefore, we adopt as our own his opinion that employee's occupational exposure to coravol was the prevailing factor causing employee to suffer a cardiac arrest on November 4, 2012. We additionally credit the opinion from Dr. Volarich identifying permanent partial disability as resulting from employee's occupational exposure.

Second Injury Fund liability

Dr. Volarich opined, in his report, that employee suffered a preexisting 25% permanent partial disability referable to the pulmonary system due to loss of pulmonary function that prevented him from being part of the hazmat team at work; we find this unrebutted opinion credible, and adopt it as our own. Dr. Volarich also included in his report the wholly conclusory opinion that the combination of employee's disabilities creates a substantially greater disability than the simple sum or total of each separate injury/illness, such that a loading factor should be added to account for enhanced disability. At his deposition, Dr. Volarich did not discuss the issue of synergy, or identify any medical findings supportive of the opinion expressed in his report.

This appears to be the extent of the evidence supporting employee's claim against the Second Injury Fund. At the hearing before the administrative law judge, employee did not provide any testimony describing a synergistic interaction between any preexisting disability and the effects of his coravol exposure on November 4, 2012. Nor did he provide such testimony at his deposition.

In our view, purely conclusory expert opinions with regard to synergy, in the absence of any explanation or supporting evidence, are generally insufficient to support factual findings that employee's preexisting disability combines with any disability referable to the claimed work injury to result in a synergistic, enhanced disability. We discern no basis to depart from this general rule here. Accordingly, we are not persuaded by Dr. Volarich's purely conclusory opinion in this regard. We find that employee's preexisting disability did not interact with the effects of his claimed primary work injury to result in any greater disability than the simple sum of disability referable to these conditions.

Conclusions of Law

Occupational disease arising out of and in the course of employment

Section 287.067 RSMo provides, in relevant part, as follows:

Employee: Dennis O'Brien

- 11 -

1. In this chapter the term "occupational disease" is hereby defined to mean, unless a different meaning is clearly indicated by the context, an identifiable disease arising with or without human fault out of and in the course of the employment. Ordinary diseases of life to which the general public is exposed outside of the employment shall not be compensable, except where the diseases follow as an incident of an occupational disease as defined in this section. The disease need not to have been foreseen or expected but after its contraction it must appear to have had its origin in a risk connected with the employment and to have flowed from that source as a rational consequence.

2. An injury or death by occupational disease is compensable only if the occupational exposure was the prevailing factor in causing both the resulting medical condition and disability. The "prevailing factor" is defined to be the primary factor, in relation to any other factor, causing both the resulting medical condition and disability. Ordinary, gradual deterioration, or progressive degeneration of the body caused by aging or by the normal activities of day-to-day living shall not be compensable.

We have found persuasive the expert medical opinion from Dr. Leikin that employee's occupational exposure to coravol (and thus cyclohexamine) produced a sympathomimetic reaction, which in turn caused employee to suffer an elevated heart rate, resulting in eventual arrhythmia and cardiac arrest. We have also found persuasive Dr. Volarich's opinion identifying permanent partial disability as resulting from that event. We conclude, in light of this persuasive expert opinion evidence, that employee's cardiac arrest had its origin in a risk connected to his employment, and flowed from that source as a rational consequence. We conclude that employee's occupational exposure to coravol was the prevailing factor causing him to suffer the cardiac arrest on November 4, 2012, and an associated permanent partial disability of 35% of the body as a whole.

We note that the administrative law judge focused on a "degree and duration of exposure" analysis in evaluating the issue whether employee met his burden of proving he suffered a compensable injury by occupational disease. See *Award*, pages 8 and 9. Specifically, the administrative law judge faulted employee's experts for not addressing the exact amount of coravol released into the boiler room while employee was working, and reasoned that, owing to this perceived failure of proof, he was *required* to deny the claim. See *Award*, page 9. In this regard, we are mindful of recent admonitions from our courts cautioning against the rejection of medical opinions on the basis of medical causation theories/criteria where the record does not suggest that such theories or criteria would have been important to the experts' ultimate opinions. See *Lawrence v. Treasurer of Mo. - Custodian of the 2nd Injury Fund*, 470 S.W.3d 6, 16 (Mo. App. 2015) and *Malam v. Dep't of Corr.*, 492 S.W.3d 926 (Mo. 2016). See also *Spencer v. SAC Osage Elec. Co-op, Inc.*, 302 S.W.3d 792, 801 (Mo. App. 2010). Again, both Drs. Leikin and Volarich maintained that identification of the exact amount of coravol leaking into the boiler room was not a necessary component of their medical causation opinions, and Dr. Farrar did not specifically rebut their testimony on this point.

Employee: Dennis O'Brien

- 12 -

In our view, a showing of the precise degree and duration of exposure in occupational disease cases is not required under the plain language of § 287.067, especially where the legislature has provided a specific and exclusive definition for the term “prevailing factor,” and where we must strictly construe Chapter 287 by virtue of the mandate under § 287.800.1 RSMo. Instead, our inquiry must turn on the sole question whether employee’s experts have persuasively established that the occupational exposure was the primary factor, in relation to any other, causing employee’s claimed injury. While a “degree and duration” analysis may bolster such testimony, the absence of such certainly does not preclude an award of benefits.

In sum, Drs. Leikin and Volarich identified employee’s occupational exposure as the prevailing factor causing employee’s claimed injury. We have credited those opinions. For this reason, we conclude the claim is compensable.¹⁸

Past medical expenses

Section 287.140.1 RSMo controls with respect to the issue of past medical expenses, and provides, in relevant part, as follows:

In addition to all other compensation paid to the employee under this section, the employee shall receive and the employer shall provide such medical, surgical, chiropractic, and hospital treatment, including nursing, custodial, ambulance and medicines, as may reasonably be required after the injury or disability, to cure and relieve from the effects of the injury.

We have found that employee’s cardiac arrest of November 4, 2012, constituted a compensable injury by occupational disease. Employee seeks \$232,840.49 in past medical expenses for the treatment he received to cure and relieve from the effects of the cardiac arrest he suffered on November 4, 2012. The courts have consistently held that an award of past medical expenses is supported when the record includes (1) the bills themselves; (2) the medical records reflecting the treatment giving rise to the bills; and (3) testimony from the employee establishing the relationship between the bills and the disputed treatment. See *Martin v. Mid-America Farm Lines, Inc.*, 769 S.W.2d 105, 111-12 (Mo. 1989). When these three elements are met, the burden shifts to the employer to prove some reason the award of past medical expenses is inappropriate (such as employee’s liability for them has been extinguished, the charges are not reasonable, etc.). See *Farmer-Cummings v. Pers. Pool of Platte County*, 110 S.W.3d 818, 822-23 (Mo. 2003); *Ellis v. Mo. State Treasurer*, 302 S.W.3d 217, 225 (Mo. App. 2009); *Proffer v. Fed. Mogul Corp.*, 341 S.W.3d 184, 190 (Mo. App. 2011); and *Maness v. City of De Soto*, 421 S.W.3d 532, 544 (Mo. App. 2014).

¹⁸ We note that in 2005, our legislature removed from § 287.067 a prior reference to the various requirements for accidental injuries set forth under §§ 287.020.2 and 287.020.3 RSMo. The obvious import of this amendment was to remove from our analysis the requirements set forth under those subsections, including the much-discussed “unequal exposure” test, see *Johme v. St. John’s Mercy Healthcare*, 366 S.W.3d 504 (Mo. 2012). For this reason, we have not applied the unequal exposure test to this claim.

Employee: Dennis O'Brien

- 13 -

Here, employee provided his bills, the medical records reflecting the treatment giving rise to the bills, and testimony identifying the bills and establishing that he received them as a result of the disputed treatment. We conclude that the burden was properly shifted to employer to demonstrate that employee "was not required to pay the billed amounts, that [his] liability for the disputed amounts was extinguished, and that the reason that [his] liability was extinguished does not otherwise fall within the provisions of section 287.270 [RSMo]." *Farmer-Cummings*, 110 S.W.3d at 823. Employer did not advance evidence sufficient to prove each of these elements.¹⁹ Accordingly, we conclude that employer is liable for employee's past medical expenses in the claimed amount of \$232,840.49.

Future medical treatment

Section 287.140.1 RSMo provides for an award of future medical treatment where the employee can prove a reasonable probability that he has a need for future medical treatment that flows from the work injury. *Conrad v. Jack Cooper Transp. Co.*, 273 S.W.3d 49, 51-4 (Mo. App. 2008). In his brief, employee does not discuss the issue of future medical care, and does not request an award of future medical care. It does appear that employee's pacemaker will require periodic monitoring from a physician, and that it runs on batteries that must be replaced every few years. Dr. Volarich also recommended that employee receive lifelong surveillance for his cardiac disease, and noted his need for daily medications, but did not offer any opinion whether employee has a need for future medical treatment that flows from the effects of employee's claimed work injury. Dr. Leikin also expressed no opinion with regard to the issue of future medical treatment.

Faced with this dearth of evidence and employee's (apparent) abandonment, in his brief, of any claim for future medical expenses, we conclude that employee has failed to meet his burden of proof with respect to this issue. We conclude that there is not a reasonable probability that employee has a need for future medical treatment flowing from the effects of his compensable work injury.

Temporary total disability

Section 287.170 RSMo provides for the payment of temporary total disability benefits while an employee is engaged in the rehabilitative process following a compensable work injury. *Greer v. Sysco Food Servs.*, 475 S.W.3d 655 (Mo. 2015). Employee claims that he was rendered temporarily and totally disabled from November 5, 2012, through April 12, 2013.

We have noted that, despite employee's eagerness to return to work, employee's doctors kept him off work through April 12, 2013, to rest and recover from a cardiac standpoint. Clearly, employee was engaged in the rehabilitative process during this

¹⁹ Employee's testimony that his own health insurance with employer may have paid certain of the disputed medical expenses is insufficient to meet employer's burden on this point, as "[p]ayments from an insurance company or from any source other than the employer or the employer's insurer for liability for Workmen's Compensation are not to be credited on Workmen's Compensation benefits." *Maness v. City of De Soto*, 421 S.W.3d 532, 545 (Mo. App. 2014), quoting *Shaffer v. St. John's Reg'l Health Ctr.*, 943 S.W.2d 803, 807 (Mo. App. 1997).

Employee: Dennis O'Brien

- 14 -

time period. Consequently, we conclude that employee is entitled to, and employer is obligated to pay, weekly payments of temporary total disability benefits from November 5, 2012, through April 12, 2013, at the stipulated temporary total disability benefit rate of \$827.75, for a total of \$18,683.50.

Employer's liability for permanent partial disability benefits

Section 287.190 RSMo provides for the payment of permanent partial disability benefits in connection with employee's compensable work injury. We have found that employee suffered a 35% permanent partial disability of the body as a whole referable to his injuries. At the stipulated benefit rate of \$433.58, we conclude that employer is liable for \$60,701.20 in permanent partial disability benefits.

Liability of the Second Injury Fund

Section 287.220.1 RSMo creates the Second Injury Fund and sets forth the criteria for an award of benefits for either permanent total or enhanced permanent partial disability. This Commission has held that conclusory expert opinions with regard to synergy, in the absence of any explanation or supporting evidence, are generally insufficient to support a claim against the Second Injury Fund for permanent partial disability benefits. See *Winingear v. Treasurer of State-Custodian 2nd Injury Fund*, 474 S.W.3d 203, 209 (Mo. App. 2015). Owing to the dearth of anything other than purely conclusory evidence on the topic, we have not been persuaded to make a finding that employee's primary injury and preexisting conditions combined in such a way as to result in greater or enhanced disability beyond the simple sum of the conditions. Instead, we have found that there is no such synergistic interaction. We conclude, therefore, that the Second Injury Fund is not liable for any compensation.

Award

We reverse the award and decision of the administrative law judge. We conclude that employee suffered a compensable injury by occupational disease.

Employee is entitled to, and employer is hereby ordered to pay, employee's past medical expenses in the amount of \$232,840.49.

Employee is not entitled to, and employer is not obligated to pay, any future medical expenses.

Employee is entitled to, and employer is hereby ordered to pay, \$18,683.50 in temporary total disability benefits.

Employee is entitled to, and employer is hereby ordered to pay, \$60,701.20 in permanent partial disability benefits.

The Second Injury Fund is not liable for any compensation.

This award is subject to a lien in favor of Kenneth Vuylsteke, Attorney at Law, in the amount of 25% for necessary legal services rendered.

Employee: Dennis O'Brien

- 15 -

Any past due compensation shall bear interest as provided by law.

The award and decision of Chief Administrative Law Judge Robert J. Dierkes, issued January 25, 2016, is attached solely for reference.

Given at Jefferson City, State of Missouri, this 27th day of October 2016.

LABOR AND INDUSTRIAL RELATIONS COMMISSION

John J. Larsen, Jr., Chairman

James G. Avery, Jr., Member

Curtis E. Chick, Jr., Member

Attest:

Secretary

AWARD

Employee: Dennis O'Brien

Injury No. 12-086272

Dependents:

Employer: ConAgra Foods Packaged Foods LLC

Before the
**DIVISION OF WORKERS'
COMPENSATION**

Additional Party: Second Injury Fund

Department of Labor and Industrial
Relations of Missouri
Jefferson City, Missouri

Insurer: Old Republic Insurance Company

Hearing Date: November 23, 2015

Checked by: RJD/cs

FINDINGS OF FACT AND RULINGS OF LAW

1. Are any benefits awarded herein? No.
2. Was the injury or occupational disease compensable under Chapter 287? No.
3. Was there an accident or incident of occupational disease under the Law? No.
4. Date of accident or onset of occupational disease: Alleged as November 4, 2012.
5. State location where accident occurred or occupational disease was contracted: Alleged as Saline County, Missouri
6. Was above employee in employ of above employer at time of alleged accident or occupational disease? Yes.
7. Did employer receive proper notice? Yes.
8. Did accident or occupational disease arise out of and in the course of the employment? No.
9. Was claim for compensation filed within time required by Law? Yes.
10. Was employer insured by above insurer? Yes.
11. Describe work employee was doing and how accident occurred or occupational disease contracted: Employee suffered a cardiac arrest while at work.
12. Did accident or occupational disease cause death? No. Date of death? N/A.
13. Part(s) of body injured by accident or occupational disease: Not applicable.
14. Nature and extent of any permanent disability: Not applicable.
15. Compensation paid to-date for temporary disability: None.
16. Value necessary medical aid paid to date by employer/insurer? None.
17. Value necessary medical aid not furnished by employer/insurer? Not applicable.

Employee: Dennis O'Brien

Injury No. 12-086272

18. Employee's average weekly wages: \$1563.14.
19. Weekly compensation rate: \$827.75 for temporary total disability and permanent total disability; \$433.58 for permanent partial disability.
20. Method wages computation: Stipulation.

COMPENSATION PAYABLE

21. From Employer:

None.

22. Second Injury Fund liability:

None.

Employee: Dennis O'Brien

Injury No. 12-086272

FINDINGS OF FACT AND RULINGS OF LAW:

Employee: Dennis O'Brien

Injury No. 12-086272

Dependents:

Employer: ConAgra Foods Packaged Foods LLC

Additional Party: Second Injury Fund

Insurer: Old Republic Insurance Company

Hearing Date: November 23, 2015

Before the
**DIVISION OF WORKERS'
COMPENSATION**
Department of Labor and Industrial
Relations of Missouri
Jefferson City, Missouri

ISSUES DECIDED

The hearing in this case was held in Marshall on November 23, 2015. Dennis O'Brien ("Claimant") appeared personally and by counsel, Kenneth Vuylsteke. ConAgra Foods Packaged Foods LLC ("Employer") appeared by counsel, Anton Andersen. Old Republic Insurance Company ("Insurer") appeared by counsel, Anton Andersen. The Treasurer of the State of Missouri, as custodian of the Second Injury Fund, appeared by counsel, Brian Herman, Assistant Attorney General. The parties requested leave to file post-hearing briefs, which leave was granted, and the case was submitted on December 30, 2015. The hearing was held to decide the following:

1. Whether Claimant sustained an accident or occupational disease arising out of and in the course of his employment with ConAgra Foods Packaged Foods LLC on or about November 4, 2012;
2. If found to have been sustained, whether the accident or occupational disease is the prevailing factor in the cause of any or all of the injuries and/or conditions alleged in the evidence;
3. Employer's liability, if any, for permanent partial disability benefits;
4. Employer's liability, if any, for temporary total disability benefits for the period November 5, 2012, through April 12, 2013;
5. Employer's liability, if any, to reimburse Claimant for past medical expenses;
6. Employer's liability, if any, for future medical benefits pursuant to Section 287.140, RSMo; and
7. The liability of the Second Injury Fund, if any, for permanent partial disability benefits.

STIPULATIONS

The parties stipulated as follows:

1. That the Missouri Division of Workers' Compensation has jurisdiction over this case;
2. That venue is proper in Saline County;

Employee: Dennis O'Brien

Injury No. 12-086272

3. That the claim for compensation was filed within the time allowed by the statute of limitations, Section 287.430, RSMo;
4. That both Employer and Employee were covered under the Missouri Workers' Compensation Law at all relevant times;
5. That the average weekly wage is \$1,563.14, with compensation rates of \$827.75 for temporary total disability benefits and \$433.58 for permanent partial disability benefits;
6. That the notice requirement of Section 287.420, RSMo, is not a bar to this action;
7. That the ConAgra Foods Packaged Foods LLC was fully insured for Missouri Workers' Compensation liability at all relevant times by Old Republic Insurance Company;
8. That Employer-Insurer paid no medical benefits; and
9. That Employer-Insurer paid no temporary disability benefits.

EVIDENCE

The evidence consisted of the testimony of Claimant, Dennis O'Brien, as well as the deposition testimony of Claimant; medical records; the narrative report and deposition testimony of Dr. Jerrold Blair Leikin; the narrative report and deposition testimony of Dr. David Volarich; the narrative report and deposition testimony of Kenneth L. White, an industrial hygienist; the narrative report and deposition testimony of Christopher Long, Ph.D., a forensic toxicologist; the narrative report and deposition testimony of Dr. Michael W. Farrar; the deposition testimony of Don Van Buskirk; the deposition testimony of Loren Kidder; medical bills; photographs; material safety data sheets; time records.

DISCUSSION

Dennis O'Brien ("Claimant") was born on November 3, 1968. He did not complete high school; he attained his GED in 1998. Claimant served three years in the military. Claimant began working for ConAgra ("Employer") in November 2002 in sanitation. In 2004, Claimant began working in the maintenance department, first as a line mechanic, then as an electrical mechanic. Claimant is still employed with Employer as an electrical mechanic.

Claimant's claim for compensation alleges that he was performing electrical installation in the boiler room on November 3 and 4, 2012, when he inhaled noxious chemicals resulting in respiratory arrest and heart failure.

Employee: Dennis O'Brien

Injury No. 12-086272

It is clear that Claimant had a compromised cardiovascular system prior to November 3, 2012. In 2005, at age 47, Claimant was diagnosed with occlusion of the superior vena cava. This required open heart surgery to bypass the occlusion. In the following years, Claimant reported residual chest and heart issues. In April 2009, Claimant went to the emergency room at Fitzgibbon Hospital due to three days of chest pain. He also complained of shortness of breath and pain with breathing. An electrocardiogram revealed a left complete bundle branch block, i.e. a malfunctioning, in his heart's electrical system.

Claimant again complained of shortness of breath and chest pains in February 2011. In addition, he was noted to be near syncope and suffering heart palpitations. A repeat electrocardiogram again revealed the presence of a left complete bundle branch block. Claimant underwent a cardiac MRI which measured a 30-35% ejection fraction. Ejection fraction is the measurement of the volume of blood that is being pumped from the heart's chamber with each beat. A normal ejection fraction is greater than 55%.

A third diagnostic test, a heart catheterization, was also performed. This two-dimensional study measured a 53% ejection fraction. Dr. Michael Farrar, a cardiologist, testified that cardiac catheterization is no longer the gold standard for measuring ejection fraction because of the limitations of measuring three dimensions. Dr. Farrar testified that the cardiac MRI is now the gold standard for measuring ejection fraction.

Claimant also testified about episodic shortness of breath not requiring medical treatment leading up to the November 2012 incident. He attributed his symptoms to his 23-year history of smoking one pack per day. The shortness of breath resulting in obstructive lung disease prevented Claimant from being a part of the hazmat team at Conagra. In addition to the obstructive lung disease, all of the medical experts agree that Claimant had non-ischemic cardiomyopathy before the November 2012 chemical exposure.

On Friday, November 2, 2012, Claimant's co-worker, Loren Kidder, began the process of installing new electrical lines in the boiler room in preparation for installation of new equipment. On Saturday and Sunday, November 3-4, 2012, Claimant and Kidder worked together on this project. The project involved (among other things) tearing out the old conduit, fabricating and installing new conduit, and pulling the wires through the new conduit. The boiler room is a brick structure 40 feet long by 30 feet wide by 30 feet tall. It houses two large boilers which take up the central part of the room.

Claimant and Kidder both testified that they began working around 8:30 A.M. on November 3, 2012. (Employer's records indicate that Claimant did not start work until 11:45 A.M. that day.) Nonetheless, it is clear that at some point between 11:30 and noon, Claimant and Kidder began noticing a very unusual pungent smell. It was coming from a valve located between the boilers; the valve was about 12" above floor level. Claimant and Kidder both agreed that there was a mist or spray coming from the valve. They inquired of boiler room personnel what the substance was that was spraying and were informed that it was "coravol". (The substance is actually "CoraVol 1973", but will simply be referred to herein as "coravol".)

Coravol is a steam-line corrosive inhibitor in liquid form that is added to the steam condensate to stabilize the PH levels, thus reducing rusting and corrosion in the pipes. Coravol is made up of 20% cyclohexylamine, 5-20% morpholine, and 60-75% water. (The focus is on the cyclohexylamine component, as Dr. Leikin and Dr. Volarich each testified that Claimant's exposure

Employee: Dennis O'Brien

Injury No. 12-086272

to cyclohexylamine was the prevailing factor in the cause of Claimant's cardiac arrest on November 4, 2012.) Both cyclohexylamine and morpholine have a "fishy" smell. The fishy smell of morpholine is detectable at a much lower concentration than is the fishy smell of cyclohexylamine by a factor of ten; therefore, even if I were to assume that the coravol in this case contained only 5% morpholine, Claimant and Kidder still would have smelled the morpholine before smelling the cyclohexylamine. As the smells are similar, it is impossible to know if Claimant and Kidder smelled only the morpholine or both morpholine and cyclohexylamine.

Claimant testified that he worked 10-12 hours on November 3, 2012, although his time sheet indicates he worked 8.58 hours. He was exposed to the coravol fumes for the entire time he was in the boiler room on November 3, 2012. Claimant and Kidder each testified that they took their normal breaks that day, and they would also take occasional brief breaks to step outside and get some fresh air. I find that Claimant was exposed to breathing coravol for a minimum of five hours on November 3, 2012.

It is noted here that all of the eye witnesses agree that it was 105° Fahrenheit in the boiler room on November 3-4, 2012 (as shown by the boiler room thermometer); Claimant and Kidder also testified that it was an additional 10° warmer in the area above the valve where they were hanging the conduit. It is also noted that it is undisputed that the dripping coravol pitted the concrete floor onto which it dripped, and that the coravol damaged metal surfaces onto which it sprayed. Additionally, it is noted that, while coravol can enter a person's system through the skin, Claimant's testimony was clear that at no time did coravol come into contact with his skin. There is, of course, no question, that Claimant and Kidder both breathed coravol.

Claimant testified that on November 3, 2012, he began feeling very sick to his stomach, his throat was scratchy, and his sinuses were painful and "felt like I was swimming underwater." Kidder also complained of sinus and throat symptoms on November 3, 2012. Claimant testified that when he went home on November 3, 2012, his wife had made him his "favorite meal" – sweet and sour chicken – but he couldn't eat it. Claimant testified that when he woke up on November 3, 2012, he "felt a little better" and went to work. Claimant's time sheet indicates he clocked in at 8:30 A.M. on Sunday, November 4, 2012. Claimant testified that he entered the boiler room between 8:30 and 8:45 A.M. Claimant testified that "that smell" was still in the boiler room; in this regard, Claimant's testimony differs from Kidder's, in that Kidder testified that he did not smell the coravol until about three hours into the workday (approximately 11:30 A.M.) Nevertheless, Claimant and Kidder both agree that the smell was very strong on November 4, 2012. They took additional breaks to get away from the smell as they did the day before. Kidder testified that he and Claimant mutually agreed around 6:00 P.M. to quit for the day as the smell was just too strong. Claimant testified that he thought they finished working in the boiler room around 8:00 P.M. on November 4, 2012. Claimant's time sheet indicates that he clocked out at 5:15 P.M. on November 4, 2012, and clocked back in at 5:38 P.M. Claimant testified that he was having similar sinus and throat symptoms on November 4, 2012, as on the previous day, but that he was "fuzzier" on November 4, 2012. Kidder testified that, in the afternoon of November 4, 2012, Claimant told him his nose, throat and lungs were "raw-feeling".

It is unclear from the evidence as to what transpired between 5:38 P.M. (when Claimant clocked back in) and 8:40 P.M. As noted above, Claimant believed he and Kidder worked in the boiler room until about 8:00 P.M. and Kidder believed they stopped working in the boiler room at 6:00 P.M.

Employee: Dennis O'Brien

Injury No. 12-086272

There is a nurse's note from Employer's nurse, Penny Parrish, which states that Claimant came to her office at approximately 8:40 P.M. on November 4, 2012, asking to see the MSDS (Material Safety Data Sheet) on coravol. Ms. Parrish's note then states that at 9:00 P.M., she heard a call on the scanner "man down, need nurse now".

Claimant testified that, after he left the boiler room on November 4, 2012 (whatever time that was), he was asked by a co-employee, Chris Townlain, to help him find something on the computer. Claimant testified he remembers sitting in the office, waiting for Townlain, and the next thing he remembers is waking up at Boone Hospital Center four days later.

Claimant suffered a cardiac arrest; ConAgra personnel administered life-saving first aid, including the use of an external defibrillator. Claimant was diagnosed with a near fatal ventricular arrhythmia and cardiac arrest. He remained in a coma at Boone Hospital Center for four days. He was treated with placement of a pacemaker and defibrillator. While in the hospital, Claimant's ejection fraction was estimated to be 20-25% at the time of his cardiac arrest.

Dr. Jerrold Leikin and Dr. David Volarich both testified for Claimant. Each testified that Claimant's exposure to cyclohexylamine was the prevailing factor in the cause of Claimant's cardiac arrest on November 4, 2012. They each testified that cyclohexylamine has a stimulant effect on the heart (the medical term being "sympathomimetic") which acts similar to a large dose of adrenaline, and which can cause elevated heart rate and arrhythmia.

Kenneth White, a certified industrial hygienist, testified for Employer. Mr. White conducted a site inspection within a few weeks of the November 4, 2012 incident. White testified that the National Institute of Occupational Safety and Health (NIOSH) set a permissible exposure level for cyclohexylamine at 10 parts per million ("PPM") during an eight-hour day, on a weighted average. After examining the area, researching the chemical involved, and using accepted scientific methods to calculate the amount of cyclohexylamine released, Mr. White concluded that only .72 PPM of cyclohexylamine was present during Mr. O'Brien's time in the boiler room, or 7.2% of the acceptable NIOSH standard.

Dr. Michael Farrar, a cardiologist, testified on Employer's behalf. Dr. Farrar testified that Claimant's cardiac arrest was not the result of his exposure to cyclohexylamine; Dr. Farrar believed Claimant's preexisting non-ischemic dilated cardiomyopathy to have been the prevailing factor of the cardiac arrest. Dr. Farrar explained that when the heart muscle is in a weakened condition and not efficiently ejecting blood through the heart, it is susceptible to cardiac arrest. Dr. Farrar testified that Claimant's cardiac MRI in March 2011 showed that his heart was pumping about 50% less blood out of the heart than normal. The accuracy of the 2011 cardiac MRI was confirmed when the post-cardiac arrest testing estimated that Claimant had a 20-25% ejection fraction just prior to his cardiac arrest.

Dr. Chris Long, a forensic toxicologist, testified that the amount of coravol to which Claimant was exposed would not have caused a sympathomimetic reaction in Claimant's heart. He based his opinion on coravol's particle size, Ken White's environmental study, and the amount of time Claimant was removed from the exposure before he had the cardiac event.

Dr. Long testified that White's environmental study established there was not sufficient release of coravol to cause significant health effects. This was also true because Claimant was only intermittently exposed to coravol, not continuously. It is also true because there was not

Employee: Dennis O'Brien

Injury No. 12-086272

enough cyclohexylamine released to exceed NIOSH standards. While Claimant could smell the coravol, he likely smelled the morpholine, not the cyclohexylamine.

Dr. Long noted that Claimant had been removed from the coravol for almost three hours before his cardiac arrest. Dr. Long reported that the half-life of coravol is between 1 ½ to 3 hours. This means that by 8:45 P.M., Claimant's coravol level would have been at least 25%-50% less than what it would have been when he was last exposed around 6:00 P.M. (Actually, it is most likely that Claimant was last exposed to the coravol at 5:15 P.M.)

Accident or occupational disease. Case law suggests that certain types of injuries or conditions may be compensable either as an accident or as an occupational disease. See, *e.g.*, *Smith v. Climate Engineering*, 939 S.W.2d 429 (Mo. App. E.D. 1996). Whether the scenario presented by the evidence is characterized as "accident" or "occupational disease", in order for Claimant's "injury" to be "compensable", the scenario presented in the evidence must be "the prevailing factor" in the cause of Claimant's injury (*i.e.*, the cardiac arrest). See *Section 287.020.3(1)*: "An injury by accident is compensable only if the accident was the prevailing factor in causing both the resulting medical condition and disability." and *Section 287.067.2*: "An injury or death by occupational disease is compensable only if the occupational exposure was the prevailing factor in causing both the resulting medical condition and disability."

Was Claimant's exposure to cyclohexylamine (a component of coravol) the prevailing factor in the cause of Claimant's cardiac arrest? There is no question that Claimant was exposed to cyclohexylamine for significant portions of each of the two workshifts (November 3 and November 4). There is credible evidence that exposure to cyclohexylamine could cause a sympathomimetic reaction in the human heart (which, in turn, could cause cardiac arrest). The **degree and duration** of the exposure would appear to be the key here. Skin exposure to hot boiling liquids *could* cause third- degree burns; however, it does not follow that a five-second skin exposure to hot tap water is the cause of a third-degree burn. The degree and duration of the exposure matter.

Claimant has the burden of proving that his exposure to cyclohexylamine was the prevailing factor in the cause of his cardiac arrest. Interestingly, Claimant's evidence contained no medical, scientific or immunological evidence as to the degree and/or duration of cyclohexylamine exposure necessary to cause a sympathomimetic reaction in the human heart. Dr. Leiken's testimony appears to assume that an exposure to cyclohexylamine in excess of the NIOSH standard of 10 PPM, for some (indeterminate) length of time would be sufficient to cause a sympathomimetic reaction in the human heart; however, no treatise or study of any kind was cited to support such assumption. (The same would be true for Dr. Volarich's testimony.) Further, neither Dr. Leiken nor Dr. Volarich could say what concentration of cyclohexylamine Claimant was exposed to at any point in time during the two days in question. They each assume that the concentration exceeded the NIOSH standard because there was a "strong smell". First of all, even assuming for the moment that the smell came ONLY from the cyclohexylamine, Dr. Leiken and Mr. White both testified that the smell of cyclohexamine is detectable at a mere 2.6 PPM. Thus the assumption that since the smell was "strong" that there was "a significant exposure over the 10 PPM" appears to me to be rank speculation. And, of course, the smell did not come only from cyclohexylamine. A majority of the smell would have come from the morpholine.

Further, there was competent evidence that the cyclohexylamine level in the boiler room did not exceed even 1 PPM. As noted above, certified industrial hygienist Kenneth White calculated the PPM of cyclohexylamine to be .72 PPM. Without going into an in-depth account of Mr. White's

Employee: Dennis O'Brien

Injury No. 12-086272

calculation, I find the methodology he used to be logical and fair (that is, fair to Claimant's position). For example, when White calculated the amount of coravol being pumped at 1.5 gallons per day, he then assumed that "every gram of cyclohexylamine and morpholine that was pumped by the unit got into the air" (Exhibit 4, White deposition, page 59). (Of course, not all of the coravol got into the air, as some dropped, as liquid, into a bucket put beneath the valve.) So, the likelihood of the cyclohexylamine concentration exceeding .72 PPM at any point in time is a minute one.

However, even if I were to assume that Claimant had been exposed to cyclohexylamine at levels significantly in excess of 10 PPM at every moment he was in the boiler room on November 4, 2012, it would still be almost impossible to believe that such exposure, which ended no later than 6:00 P.M. (and probably ended at 5:15 P.M.), would cause a cardiac arrest at 8:45 P.M. or later. The maximum sympathomimetic effect would have been occurring while Claimant was actually exposed to cyclohexylamine; however, Claimant's cardiac arrest did not occur while being exposed to cyclohexylamine, nor shortly after such exposure, but rather three hours or more post-exposure. The sympathomimetic effect of the cyclohexylamine would have been predictably decreasing during those three hours of non-exposure.

Therefore, I must find that Claimant has not met his burden of proof that the accident or occupational disease was the prevailing factor in the cause of his cardiac arrest. In light of such finding, all other issues are moot. Claimant's claim for compensation must be denied in full against both Employer and the Second Injury Fund.

FINDINGS OF FACT AND RULINGS OF LAW

In addition to those facts and legal conclusions to which the parties stipulated, I find the following:

1. On November 3, 2012, and on November 4, 2012, Claimant and Loren Kidder were working in the boiler room;
2. On November 3, 2012, and on November 4, 2012, a valve in the boiler room was leaking a chemical compound called "CoraVol 1973" (hereinafter referred to as "coravol");
3. On November 3, 2012, and on November 4, 2012, Claimant and Loren Kidder were working in the vicinity of the coravol leak;
4. Coravol is composed of 20% cyclohexylamine, 5-20% morpholine, and 60-75% water;
5. Both cyclohexylamine and morpholine have a "fishy" smell;
6. The fishy smell of morpholine is detectable at a much lower concentration than is the fishy smell of cyclohexylamine by a factor of ten;
7. Claimant and Loren Kidder detected the "fishy smell" on November 3, 2012;
8. On November 3, 2012, Claimant was exposed to coravol for at least five hours;
9. On November 3, 2012, Claimant breathed in the coravol, but at no time did liquid coravol come into contact with Claimant's skin;
10. On November 3, 2012, Claimant complained of pain and discomfort in his stomach, throat and sinuses;
11. On November 4, 2012, Claimant was exposed to coravol in the boiler room from 11:30 A.M. until 5:15 or 6:00 P.M., although Claimant did leave the boiler room at various times;
12. On November 4, 2012, Claimant breathed in the coravol, but at no time did liquid coravol come into contact with Claimant's skin;

Employee: Dennis O'Brien

Injury No. 12-086272

13. On November 4, 2012, Claimant again complained of pain and discomfort in his stomach, throat and sinuses, and also felt "fuzzier" than the previous day;
14. On November 4, 2012, at approximately 8:40 P.M., Claimant went to Employer's nurse, Penny Parrish, asking to see the MSDS on coravol;
15. On November 4, 2012, between 8:45 P.M. and 9:00 P.M., Claimant suffered a cardiac arrest;
16. Cyclohexylamine, in sufficient concentration, may cause a sympathomimetic reaction in the human heart, which, in turn, could cause cardiac arrest;
17. As determined by NIOSH, the maximum permissible exposure to cyclohexylamine, during an eight-hour day, on a weighted basis, is 10 PPM;
18. The level of cyclohexylamine in the boiler room on November 3, 2012, did not exceed 1 PPM;
19. The level of cyclohexylamine in the boiler room on November 4, 2012, did not exceed 1 PPM;
20. Claimant's exposure to cyclohexylamine in the boiler room on November 3 and 4, 2012, was not the prevailing factor in the cause of Claimant's cardiac arrest;
21. Claimant did not sustain a compensable accident or a compensable occupational disease; and
22. Claimant's claim for compensation must be denied in full against both Employer and the Second Injury Fund.

ORDER

Claimant's claim for compensation against Employer is denied in full.

Claimant's claim for compensation against the Second Injury Fund is denied in full.

Made by _____
/s/ Robert J. Dierkes 1-25-16
Chief Administrative Law Judge
Division of Workers' Compensation