MD CONSULTING SERVICES LLC

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March 18, 2018

F. Lee Bailey, J.D.Bailey, Cochran & Shapiro, P.C.320 Bijou StreetColorado Springs, CO 80903

Re: P. L.

Dear Mr. Bailey,

You have asked me for my opinions and comments regarding your client P.L. who was injured while walking home and unfortunately fell into a hole at a construction site. I have reviewed the medical records you provided concerning your client P. L. I also interviewed Mr. L and his wife by telephone on February 28, 2018 for one hour. This report will briefly review Mr. L's accident and resulting medical problems as a result of his accidental fall on January 23, 2017.

I will also answer your specific question concerning Mr. L. developing diabetes mellitus (DM) after the accident. You asked, "Does trauma cause, interfere or exacerbate Diabetes Mellitus." I will also comment on your questions "Would the natural patho-physiology of P. L.'s pre-trauma medical status have inevitably resulted in his being diabetic and if he had been left alone would he now have diabetes?"

Medical Records Reviewed:

Anderson County Sherriff's Incident Report-Officer F. Johnson reporting 1-24-17

Witness Statements (4 Statements) 1-24-17 to 2-1-17

Sherriff's Photographs Post-Accident 1-24-17

Anderson County Ambulance Service Log 1-24-17

Client's Journal 1-24-17 to 3-7-18 written by D. L. (Client's wife)

Anderson County Hospital Records 1-24-17 to 1-25-18

Wallace Medical Center Records 1-25-17 to 2-13-17

Pre-Accident Medical Records 12-28-08 to 7-08-17

Brief History of Events

As you know, Mr. L. is a 68-year-old retired man who while walking home fell into an approximate 5-foot-deep hole at a construction site on the night of January 23, 2017. There were no fences, warning signs or warning lights indicating there was a hole and the hole was unprotected for

passersby. Pictures of the building site show that the bottom of the hole was dirt and rocks, in addition, the front, back and sides of the hole had exposed rebar. Mr. L. was not found until approximately ten hours after his fall at approximately 8:00 am the next day. When Mr. L was found EMT's on the scene found Mr. L. hypothermic with a tympanic temperature that registered 16° C or 61° F. He was treated appropriately at the scene of the accident. He then had to be transported via ambulance in a crouched-fetal position due to his body being so stiff from the cold.

Mr. L was first seen in the Anderson County Hospital Emergency Department in Anderson, CO. An early note reported Mr. L. was "extremely stiff and had remarkably cold body parts everywhere." He had evidence of blunt force trauma over his left orbit (bones of the eye). He had orbital edema (swelling) and an orbital hematoma and ecchymosis (bruising). He clearly was suffering from extreme hypothermia. Mr. L had agonal breathing (shallow, slow, i.e., 3-4 per minute, irregular inspirations followed by irregular pauses) and verbal utterings that were not intelligible.

It is my opinion Mr. L. received what I believe to be excellent care at that facility. Notes from Anderson County Hospital report Mr. L. had lacerations and ecchymosis to the head. He was diagnosed with a Traumatic Brain Injury in addition to hypothermia. It appears he hit his head during the fall and may have been rendered unconscious for a period of time. It was also found that Mr. L. had lost a considerable amount of blood. Due to the severity and uncommon nature of Mr. L.'s condition he was transferred via Flight for Life helicopter to Wallace Medical Center in Colorado Springs, CO.

He was hospitalized at Wallace Medical Center until February 13, 2017. Again, in reviewing the medical record, the Wallace physicians and hospital staff provided excellent care. It is my opinion to a reasonable degree of medical probability that Mr. L. could have very likely died from his injuries and hypothermia were it not for his superb care. This finding is important and I will come back to it in answering your question about his onset of diabetes.

Ongoing Medical Problems

Since the time of the accident Mr. L. complains of four significant ongoing injuries. First, Mr. L. reports hip and knee pain more so on the right side. He reports prior to the accident he was walking three miles a day without pain. Since the accident, due to his hip and knee pain, he can only walk very short distances.

Mr. L. was diagnosed with a Mild Traumatic Brain Injury (MTBI). He suffers from ongoing brain injury symptoms. Specifically, Mr. L. reports decreased concentration, decreased math skills, word finding problems, short term memory loss and severe problems with speed of information processing. As well, Mr. L. reports difficulty in all areas of executive functioning. Mr. L. states "My thinking is not as quick as it used to be." It should be noted "Mild" refers only to the degree of actual observable brain damage and not to the profound and sometimes permanent cognitive loss and other symptoms that patients with MTBI may sustain.

Mr. L. also has developed Post-Traumatic Stress Disorder (PTSD). Mr. L. reports he was absolutely certain he was going to die after falling into the hole. His PTSD is characterized by nightly accident-related nightmares, crying spells, decreased concentration and recurrent

intrusive terrifying daytime thoughts occurring daily about the accident. Mr. L. repeated several times during our one-hour telephone interview "I am not the man I used to be." He was directly describing how he feels about his masculinity, self-esteem and self-worth. These repeated thoughts and feelings are causing him a great deal of low self-esteem and mental anguish.

Answers to Your Specific Questions

With regard to one of the specific questions you asked, it is my opinion to a reasonable degree of medical probability that Mr. L. developed Diabetes Mellitus (DM) as a direct result of the physical and emotional trauma he sustained due to the accident. It was noted immediately on admission to Anderson County Hospital that Mr. L.'s blood glucose was 386 with the normal range being 70-110. This blood work was done in the Emergency Department and Mr. L.'s blood glucose tests remained elevated until he was placed on Metformin 500mg twice daily along with Glycoside 2.5 mg with dinner while he was hospitalized at Wallace Medical Center. These medications are oral agents used to reduce blood glucose levels and treat DM. For example, his blood glucose level on January 28, 2015 was 222. He also had an elevated A1C blood test for DM before his discharge from Wallace Medical Center. On February 1, 2017 his blood glucose level had reduced to 146.

It is extremely important to note Mr. L. had no past history of elevated blood glucose levels prior to his accident nor was his A1C ever elevated. These findings go back several years in his medical records. In a hospital note by K. D. D., M.D. dated 1-25-17 Dr. D. states "He does have a strong family history of mother, brother and sister with diabetes. His niece is a Family Practice physician in the area and is aware of his family history and has followed him closely. Apparently blood sugars and A1C have been normal." Dr. D. was a consulting endocrinologist on the case. On discharge from Wallace Medical Center, based on the consensus of his treating doctors, Mr. L. now carries a diagnosis of Type 2 Diabetes Mellitus.

In a note dated 2-1-17 J. A. C., M.D. states "The patient was found to have elevated finger stick blood sugar levels. For that reason Dr. D. and Endocrinology was (sic) consulted. It was determined that the patient either had previously undiagnosed type 2 diabetes mellitus or this was secondary to his overall ordeal." Review of Mr. L.'s medical record show no evidence of previously undiagnosed DM. As outlined in the discussion and papers below it is well accepted that in individuals with a pre-existing propensity to develop DM, physical and/or emotional stress and/or trauma can induce an otherwise latent DM condition to become active and permanent. In fact, to make a definitive diagnosis that trauma has brought on Diabetes Mellitus, the patient must have either some personal medical evidence of potential DM or DM must be present in close family members.

It is impossible to state with certainty that Mr. L. would have developed DM without the trauma. The converse is more likely than not, that Mr. L. developed DM *after* the trauma he sustained.

Diabetes Mellitus and Trauma/Stress

Type 2 Diabetes Mellitus (DM)

The cause of Diabetes Mellitus is unknown, however, there is ample evidence in the medical

literature that in individuals with a predisposition or a susceptibility to DM, trauma can provoke the onset of the disease. The literature states the trauma can be physical and/or emotional and in Mr. L.'s case both kinds of trauma were sustained. These susceptible individuals have latent diabetes or a heredity predisposition that changes DM to an active form of Diabetes Mellitus following trauma.

Mr. L. has a hereditary predisposition to diabetes with several family members having been diagnosed with DM prior to Mr. L.'s fall. As noted in the doctor's note above and confirmed by Mr. L., his mother and sister died of complications of Diabetes Mellitus. He also has an older brother with DM. It is well accepted that having close family members with DM is a predisposing factor in developing DM. There is a direct temporal relationship to Mr. L.'s trauma from the fall and the onset of his DM. In a classic paper by Elliot P. Joslin, M.D. he states, "To prove that trauma is the cause of diabetes in any individual case evidence must be at hand to show (a) that the disease did not exist before the trauma (b) That the trauma was severe (*such as but not limited to injuring the pancreas*) (my italics) (c) That the symptoms and signs of the disease developed within a reasonable period following the trauma (d) That the symptoms and signs of signs of diabetes were not transitory but permanent." This paper is enclosed.

As noted, the cause of Type 2 DM is unknown, however, there is ample evidence in the literature that in individuals with a predisposition to DM, trauma can provoke the onset of Diabetes Mellitus. These individuals have latent diabetes changing to active Type 2 DM following trauma.

On 7-19-2015 a Decision of the Appeal Division (Worker's Compensation Reporter 12-1-15) a physician and professor of medicine expressed this opinion:

"It is well known that marked alterations in immune mechanisms secondary to stress or incidental illness do precipitate the development of diabetes."

"When we state that this patient had a subclinical form of insulin dependent diabetes it means that he had absolutely no clinical signs or symptoms but by esoteric test (islet cell antibody determination) this might have been detected...This patient then underwent a major accident and the disease became manifested almost immediately thereafter. It is, therefore, more than an even chance that the disease triggered this onset and, moreover, he might not have had the onset of the disease for several years, thereafter. No one can state categorically that there is no relationship, and no one can state categorically that there was."

They go on to state "After discussion with university endocrinologists and diabetologists, a consensus exits that, viewed in retrospect, non-clinical latent diabetes mellitus became clinical type 1 diabetes approximately 3 weeks after an industrial accident. Therefore, viewed in the context of sub-clinical versus clinical disease, it seems equally likely that the work-related injury was important in precipitating the disease. Notwithstanding the theoretical claims, I would affirm that the injury gave rise to his illness." This report was referring to Type 1 diabetes, however, given the age of the individual (adult onset) it should hold true for Type 2 diabetes as well. The report is enclosed.

It is well accepted that glucose toxicity can be brought on by stress. In a March 2003 article in

Diabetes, volume 52 Robertson et al. state "In diabetics an increased secretion of stress hormones in connection with trauma is observed." "Chronic exposure to hyperglycemia can lead to cellular dysfunction that may become irreversible over time, a process termed glucose toxicity." The authors go on to state "The major thesis of this article is that unrelenting deterioration of β -cell function over time in Type 2 diabetes may be explained by incompletely treated hyperglycemia, which in turns forms excessive levels of ROS (reactive oxygen species) that continually bombard and damage the β -cell." It is noted in Mr. L's medical record that he had significantly elevated blood glucose levels throughout his hospitalizations at Anderson County Hospital and Wallace Medical Center. This rapid onset of high insulin levels often found in trauma patients can lead to the unrelenting deterioration of β -cell function as noted above. The paper is enclosed.

A 2009 article in *Psychosomatic Medicine* volume 55 Surwitt et al. state "Several researchers have shown that hyperglycemia can be produced by chemical stimulations of the brain with morphine and by a variety of endogenous neuropeptides." This paper suggests that physical insults such as morphine can increase blood glucose levels and thus type 2 DM. Mr. L. clearly had several physical traumatic events from the accident. In fact, it should be noted that Mr. L. was also diagnosed with a Traumatic Brain Injury from the accident and thus contusions to the brain may cause this chain of events and a variety of endogenous neuropeptides will be manufactured and released into the blood stream as well as by the hypothermia he experienced. The paper is enclosed.

A February 2013 article in *Brain, Behavior and Immunity* by Paul H. Black M.D. states "C reactive proteins (CRP) are strongly associated with and likely play a dominant role in the development of this inflammatory process which leads to insulin resistance, non-insulin dependent diabetes mellitus type II." Clearly based on the severity of the trauma Mr. L. sustained elevated CRP's that lead to diabetes would be elevated. In other words with the severity of Mr. L.'s acute physical trauma, his immune system had to be working to maximum capacity leading to strong almost bodywide inflammatory processes which leads to insulin resistance in non-insulin dependent diabetes mellitus (type 2 DM). This paper is enclosed.

Hicks states in a 2010 paper "Trauma may precipitate latent diabetes and its complications and make control more difficult." Abstract is enclosed.

In an article in *Psychosomatic Medicine* 55:380 1995 Surwitt et al. state "Thus, there is some evidence of a pre-existing autonomic nervous system defect that could allow stress to play a role in mediating the onset of the disease (DM)." They go on to state "The effects on glucose metabolism are mediated by a variety of "counter-regulatory hormones" that are released in response to stress and that result in elevated blood glucose levels and decreased insulin action." Mr. L. has two major stress induced activities. First Mr. L. was certain he was going to die within the first 10 hours of the accident and Mr. L.'s radical change in self-perception stating, "I am not the man I used to be." This paper is enclosed.

It is my opinion there is no greater stress than when individuals are convinced there is no way out and they believe with certainly that they are going to die. There, perhaps, is no greater stress which induces biochemical stress reactions in the body. This is a "pure" case of emotions having the ability to bring on diabetes in those susceptible individuals.

Based on the facts of the case regarding Mr. L.'s physical and emotional injuries and the scientific literature written about this topic, it is my opinion to a reasonable degree of medical probability that Mr. L. developed Diabetes Mellitus as a direct result of his fall on January 23, 2017 which precipitated both physical and emotional triggers great enough to cause Diabetes Mellitus in Mr. L. who was susceptible to this outcome.

Please let me know if you have further questions. My CV is enclosed.

Sincerely,

Armin Feldman, M.D. MD Consulting Services LLC