

RE:
DOB:
DOI:

Dear Mr. XXXX,

I appreciate the opportunity to meet and medically evaluate XXX. As per my standard practice, a record review has been completed in conjunction with history and physical examination. Your office provided me with a 274-page digital copy of documents indexed as follows:

- Gold Cross Ambulance Records
- Utah Highway Patrol Police Report
- IMC Records
- Ambulance Bill
- Photos of XXXX
- XXX Family Practice Records
- XXX Family Practice Family Records Priors
- Statement XXXXX 1
- Statement XXXXX 2
- Statement XXXXX 3
- Highway Patrol Police Report

XXXX was evaluated at Advanced Spine and Pain, located at 11760 South 700 East suite 112 Draper, UT 84020 on January XX, 20XX. She was accompanied by her son who was present throughout the visit. I explained that my role as an independent practitioner is to provide a medical opinion and that I would not be involved directly in rendering any future medical care for her. She expressed understanding and agreement to proceed.

HISTORY OF PRESENT ILLNESS:

XXXX is a XX-year-old female is a mother of X children, who worked for XXXXXX. She has a medical history of epilepsy which is treated medically and controlled, however, with this diagnosis she does not drive. She was seated in the rear most right seat of a 2004 Dodge Durango when she was involved in a motor vehicle collision (MVC) on XX/XX/XXXX. Per Utah Highway Patrol Police Report, she was traveling southbound on I-15 at

approximately XXXX South when her vehicle became disabled and was stopped in the middle lane of the highway. A second vehicle, a Silver Honda Civic, did not see the disabled vehicle and collided with XXXX's vehicle in the rear, pushing her vehicle to collide with a third vehicle that was ahead of her vehicle. Emergency Medical Services (EMS) noted an 8-inch intrusion on the back end of XXXXX's vehicle and damage all along the right and left sides. It was estimated that the vehicle that collided with XXXX's vehicle was traveling approximately 70-113 mph. XXXXX was restrained with a shoulder and lap seatbelt. Airbags from the side and front were deployed. EMS personnel were only able to reach one of XXXXX's hands from the front seat and she required extrication by removing the right rear car door. At the time of EMS evaluation, she was alert and responsive and reported pain "everywhere". She specifically noted pain in her right leg during transportation. She was transported via ambulance as a Trauma II to Intermountain Medical Center.

Upon arrival at Intermountain Medical Center Emergency Department, the patient was assessed and imaging was ordered. Pertinent positives found are listed below:

CT Brain/Head w/o Contrast

XX/XX/XXXX 22:22:00

Radiologist: Joseph Young MD

"IMPRESSION:

- Mild comminution associated with slightly medially displaced left occipital condyle fracture. Normal articulation within the atlantooccipital joints.
- No evidence for intracranial hemorrhage, stroke or obvious mass on this non-contrast CT.
- No evidence for cervical fracture or dislocation.
- Right third rib fracture and right second rib fracture posterior medially.
- There may be a small adjacent pleural effusion or hematoma."

CT Spine Thoracic w/o Contrast

XX/XX/XXXX 22:22:00

Radiologist: Joseph Young MD

"IMPRESSION:

- Comminuted T3 vertebral body fracture with displacement toward the left likely unstable. One of the comminuted fragments narrows the neural foramen at T3-4. This is associated with a 10 mm fragment. There is mild narrowing of the central spinal canal at this level. Also nondisplaced fracture of T4.
- Nondisplaced sternal body fracture.
- Multiple transverse process fractures on the left involving T4 and T5 but otherwise the vertebral bodies are intact and nondisplaced without central canal narrowing.
- Right comminuted sacral alar fracture. There is also disruption of both sacroiliac joints. Additional fractures involve the posterior aspect of the right iliac bone at the sacroiliac joint as well as superior and inferior pubic rami fractures

bilaterally.

Posterior and superior dislocation of the right hip with fracture of the acetabulum. Small amount of free fluid in the right paracolic gutter probably related to known fractures. There is no free fluid in the pelvis.

Small rib fractures on the right involving second third ribs with small extra pleural hematoma and multiple pulmonary contusions. No pneumothorax."

CT Abdomen and Pelvis with Contrast

XX/XX/XXXX20 23:06:43

Radiologist Joseph Young

"IMPRESSION:

- Right sacral alar fracture extending into the S1-S2 neural foramen. There is anterior displacement of the sacral alar relative to the right iliac bone. There is significant widening of the left sacroiliac joint. The right femur is dislocated posteriorly. There is a fracture of the posterior aspect of the acetabulum with multiple small fragments present. Small inferior left fracture of the sacrum extending into the coccyx.
- Inferior and superior right pubic ramus fracture. Intact symphysis pubis. Fracture of the inferior and superior pubic rami on the left. The superior left pubic ramus fracture extends into the acetabulum and is technically intra-articular.
- Strand-like changes seen in the left paracolic gutter extending to the left groin. Findings are consistent with small hematoma. No fluid extends into the posterior uterine cul-de-sac."

XR Pelvis 1 or 2 Views

XX/XX/XXXX 22:22:00

Radiologist: Jonathan Shakespear

"IMPRESSION:

- Diastatic right parasymphyseal fracture.
- Comminuted fracture of the posterior right acetabulum with superior/posterior dislocation of the right femoral head.
- Bilateral sacral fractures.
- Inferior left pubic ramus fracture"

XR Hip 1 View Right

XX/XX/XXXX 23:14:00

Radiologist: Joseph Young MD

"IMPRESSION:

- Posterior-superior dislocation right hip.
- Laterally displaced large acetabular fragment.
- Right superior and inferior pubic symphysis fractures, bilateral sacral alar fractures."

XR Hip 1 View Right

XX/XX/XXXX

23:19:00

Radiologist: Joseph Young MD

"IMPRESSION:

- Posterior superior dislocation right hip with large acetabular fragment displaced laterally.
- Pubic symphysis fractures, sacroiliac fracture and disruption of the right SI joint."

In the trauma bay, she was placed in a Cervicothoracic bracing system (CTO) due to unstable T3 fracture and slightly medially displaced left occipital condyle fracture. Attempts were also made to reduce the right hip dislocation. Under procedural sedation, Dr. Frandsen and Dr. Fisher attempted to reduce the fracture, but were unsuccessful using bedside maneuvers. Dr. Widmer, Orthopedic Surgery, was consulted and recommended placing a pelvic binder and putting her right lower extremity in Buck's traction. She was transferred to the Shock Trauma Intensive Care Unit (STICU) for further stabilization. Right rib 2nd and 3rd and left rib 2-5 fractures and a sternal fracture that were treated non-operatively with analgesics and rest.

On XX/XX/XX, XXXX underwent a closed reduction right hip joint and placement of distal femoral traction pin by Dr. Justin Hawes to stabilize her right posterior wall acetabulum fracture and right posterior hip dislocation. She was unable to initially undergo the planned pelvis/acetabulum open reduction internal fixation as she had an unstable T3 fracture which would make positioning for the ORIF difficult and high risk. No immediate complications were noted and she was transferred to STICU intubated and with a nasogastric tube for nutritional support.

On XX/XX/XX XXXX underwent a bilateral T1,2,3,4,5,6 segmental fixation and fusion using pedicle screws and rods with allograft bone by Dr. Mark Reichman, Neurosurgery. Intraoperative neuromonitoring studies demonstrated minimal motor response at baseline assessment, which remained unchanged after positioning and throughout the remainder of the operation, indicating no immediate neurological changes. There were no reported intraoperative complications and she was transferred back to the STICU intubated.

XXXX's pelvic injuries consisted of multiple fractures in the anterior ring including a right-sided parasymphyseal fracture, left pubic root, and inferior pubic ramus fracture. She sustained bilateral sacral fractures with associated fracture of the right sacroiliac joint and left sided sacroiliac joint disruption. In addition, she sustained a right sided posterior wall acetabular fracture with an associated dislocation of the right hip joint, initially stabilized with the closed reduction by Dr. Hawes, as noted, and had been maintained in traction. Definitive treatment of her pelvic injuries was initially deferred until the thoracic spine injury was stabilized by Dr. Reichman.

On XX/XX/XX she underwent an open reduction internal fixation (ORIF) of the left pubic root fracture, ORIF right parasymphyseal ramus fracture, percutaneous screw fixation of the right sacroiliac fracture/dislocation, percutaneous screw reduction/fixation of the left sacroiliac joint displacement, and ORIF right posterior wall acetabulum fracture with Dr. Hawes. Dr. Hawes noted in his operative report "Upon examining the muscular tissues of the posterior hip and pelvis, there had been significant disruption and devitalization of the deep hip external rotators. The obturator internus as well as the inferior and superior Gemelli muscles had been completely disrupted from off of their origin in the inner aspect of the pelvis. The muscle belly had been completely pulled into the outer aspect of the pelvis and was obviously devitalized. I used a combination of scissors and scalpel to debride necrotic muscle. There did appear to be some evidence of disruption of the quadriceps femoris muscle as well and it too was debrided back to what appeared to be healthy bleeding tissue. There was some notable necrosis involving the gluteus minimus muscle as well. It too was sharply debrided back to healthy viable tissue." No intraoperative complications were reported. Patient was transferred back to the STICU in stable condition, intubated.

Once the above surgeries were complete, the STICU team began to wean XXXX from sedation to assess her neurologic status. She was able to move all 4 extremities, but continued to be sedated above the expected level and a repeat head CT was performed and reportedly normal:

CT of the brain without contrast

XX/XX/XX

Radiologist: Fernando Rodriguez

"Impression: No acute abnormality identified."

An EEG was performed 4/10/20 and was read by Dr. Meghan Ward, Neurology, as abnormal. "The sharp waves with triphasic morphology could be a nonspecific marker of encephalopathy or could confer an increased risk of focal or generalized onset seizures. The background disorganization and slowing were suggestive of nonspecific moderate to severe encephalopathy." No obvious epileptiform activity was noted, and no changes to home anti-epileptic regimen was recommended. Encephalopathy noted in STICU was likely due to traumatic brain injury sustained in the MVC XX/XX/XXXX. XXXX's mental status improved daily, and she was able to be extubated XX/XX/XX.

On XX/XX/XX she was discharged to an acute rehabilitation facility where she underwent rigorous therapy including physical therapy for balance and coordination, occupational therapy focused on vision, cognition, activities of daily living, and speech language therapy. Her feeding tube was removed XX/XX/XX. She continued to progress with therapy and XXXX was discharged home on XX/XX/XX. She continued home health PT/OT/SLT.

Dr. Kate Berg, her primary care physician, resumed care of patient after discharge. She noted significant hair loss and was found to have hypothyroidism which was not present previous to the MVC. She was initiated on levothyroxine. Patient also reported several days of nausea each week during her visit on XX/XX/XX. Dr. Berg was unclear if this was related to the TBI. She was given Zofran for symptomatic treatment, which completely resolved over the course of a few weeks and she no longer required Zofran.

PAST SURGICAL HISTORY: 4 C-sections, right hip closed reduction/stabilization, T1-6 fusion, pelvis reconstruction,

PAST MEDICAL HISTORY: Eczema, Epilepsy, hypothyroidism

SOCIAL HISTORY: XXXX is married. She lives in XXXX, UT with her husband XXXX. She is the mother of X XX-year-old boys. She previously worked at XXXXX. She denies use of tobacco, alcohol, illicit drugs.

PSYCHIATRIC: Suicidal ideology at a young age. Denies any recent history of anxiety, depression, or other psychiatric disorders.

FAMILY HISTORY:

Grandfather- deceased cancer

Father-deceased

Mother- alive

ALLERGIES: Amitriptyline, Codeine, Morphine, Penicillin

MEDICATIONS:

Acetaminophen 500mg 2 tablets oral every 8 hours prn

Divalproex sodium 125mg 4 caps oral BID

Divalproex sodium 500mg 2 caps oral at bedtime

Ferrous sulfate 325mg 1 tab Po daily

Levothyroxine 100mcg 1 cap PO daily

Melatonin 3 mg 1 tab PO daily

Multivitamin 1 tab PO daily

REVIEW OF SYSTEMS:

Constitutional: Denies fever, chills, or weight loss

HEENT: Reports fussy vision in the morning due to tearing, no other visual changes, nasal congestion, sinus pain, sore throat, or hearing changes.

Cardiovascular: No chest pain, SOB, palpitations, or edema

Pulmonary: cough, wheezing, or dyspnea

Gastrointestinal: No nausea, vomiting, diarrhea, abdominal pain, or constipation

Genitourinary: Reports urinary incontinence which is improving with pelvic floor strengthening, No dysuria, urinary frequency, or hematuria

Musculoskeletal: Reports joint stiffness of the right hip, pain with forward flexion of the right hip, No joint swelling

Skin: No skin lesion, itching, hair changes

Neurologic: Reports paresthesia of the superficial cutaneous area near her thoracic spine fusion incision. No weakness, numbness, loss of consciousness, syncope, dizziness, or headaches

Psychology: No anxiety/panic, depression, insomnia, suicidal ideations

Heme/Lymph: No bruising, bleeding, or lymphadenopathy

Endocrine: No polyuria, polydipsia, or temperature intolerance

PHYSICAL EXAM:

General: Well-developed and well-nourished, alert, no apparent distress, oriented to person, place, time, and situation

Eyes: Conjunctiva clear, eyes normal, sclera clear

ENT: Hearing grossly intact, no nasal discharge, oral cavity and pharynx normal.

Cardiovascular: Regular rate and rhythm, no murmurs

Respiratory: Clear to auscultation, no rales, rhonchi, or increased work of breathing

Gastrointestinal: Positive bowel sounds, No tenderness to palpation.

Musculoskeletal:

Gait: Antalgic gait with shuffling and short leg stride

Back: Exaggerated kyphosis of the thoracic spine, well-healed incision of the upper thoracic spine with minimal paresthesias to soft touch around the incision, muscle spasm of the cervical paraspinal muscles without tenderness. Decreased range of motion of the cervical spine. She was able to flex her neck to about 45 degrees, however, her extension was limited to approximately 10 degrees lateral flexion of 22 degrees bilaterally, and rotation of 45 degrees bilaterally. ROM limited by pain in cervical spine more so in extension, rotation and tilt than in flexion. Spurling's sign was positive for right arm paresthesias in a C5,6 distribution. Axial loading was positive bilaterally in the mid to upper portion. No pain with ROM of thoracic or lumbar spine and no gross deformity with palpation.

Extremities: No significant deformity or joint abnormality. No edema. Peripheral pulses intact.

Lower Extremity: Ankles, feet, and toes are grossly normal with normal range of motion. Normal distal capillary filling of less than 2 seconds. No tenderness, swelling, discoloration, nodules, weakness or deformity. Knees are grossly normal without deformity, normal range of motion, normal sensation without tenderness, swelling, discoloration, or crepitus. Hips are grossly normal without deformity. Well-healed scars on the right are noted. Right hip pain provoked with forward flexion greater than 80 degrees.

Neurological:

CN II-XII intact.

Motor: 4+/5 right biceps, otherwise 5/5 throughout bilateral upper and lower extremities.

Sensory: no radicular pain, pinprick sensation symmetric reduced in the right L5 and S1 distal dermatomes but was otherwise intact throughout.

Reflexes: 1+ throughout bilateral upper extremities, 1+ of bilateral patellar and 0 Achilles.

Cerebellar testing normal.

Skin: Skin normal color, texture and turgor with no lesions

Psychiatric: Mini Mental Status exam was 30/30. The mental examination revealed the patient was oriented to person, place, time and situation. The patient was able to demonstrate good judgement and reason, had a normal affect, slow response to questions with mild word finding problems, no hallucinations, or abnormal behaviors, during the examination. Patient is not suicidal.

IMPRESSION:

XXXX was a fairly healthy woman, with mild, controlled epilepsy who sustained multiple injuries, from an MVC on XX/XX/XXXX. I believe within a reasonable degree of medical certainty that these injuries resulted from the collision. Below I have detailed her specific injuries, the current functional status, and future prognosis associated with these injuries.

Thoracic spine:

XXXX was seated in the rear right seat of a Dodge Durango that stalled on the freeway when it was rear ended on XX/XX/XXXX by a vehicle reported traveling approximately 70-113 mph. The impact caused an 8 inch of depression in the rear of her vehicle. She required extrication from the vehicle by Emergency Medical Services due to external damage of her vehicle. On evaluation in the ED, she was found to have a complex T3 vertebral body fracture with one of the comminuted 10 mm fragments narrowing the neural foramen at T3-4. A nondisplaced fracture of T4 and transverse process fractures of the left T4 and T5 were also noted without central canal or other foraminal narrowing. She underwent a bilateral T1,2,3,4,5,6 segmental fixation and fusion using pedicle screws and rods with allograft bone, using O-arm stereotactic localization, by Dr. Mark Reichman on XX/XX/XX. Post-operative management included physical therapy and occupational therapy modalities in inpatient, acute rehab, home health, and outpatient settings. She has slightly exaggerated kyphosis on exam, demonstrated about 30 degrees of lateral rotation. She denies any pain with ROM of her spine. It is my clinical assessment that XXXX has reached maximum medical improvement at this time in regards to her thoracic spine injury.

Although XXXX is currently asymptomatic and has no reported limitations, she continues to be at risk for future medical complications. Long-term complications from spinal instrumentation with pedicle screw fixation include screws breaking, becoming loose, and fracture of the instrumented or adjacent vertebrae. Such sequelae may require further surgery to remove or revise the hardware, or

extend the fusion to treat adjacent level degeneration. The incidence of screw loosening is between 4.7% - 19.8% [1]. XXXX is middle-aged, with no known osteoporosis or diabetes, which decreases her risk of this complication. But due to the multilevel fusion and multiple pedicle screws used this is still a possibility. Most hardware complications can be managed non-operatively, however, if spinal fusion revision surgery is required, the cost range from \$65,000 - \$130,000 depending on the required surgery and facility.

Other issues to consider in multilevel fusion surgery include the risk of failed or incomplete fusion (nonunion), as well as the theoretically higher risk of adjacent level degeneration. Fusion failure of one or more levels in multilevel fusion surgery can occur in as high as 40 to 50 percent of cases, and is highly dependent on patient risk factors and the surgical technique used [2]. XXXX is lower risk as she is not a smoker, she does not have a history of osteoporosis, diabetes, or a history of prior fusion failure. However, she does continue to have a higher risk due to multilevel fusion.

Mobile spinal (cervical and lumbar) levels surrounding a spinal fusion are placed under additional stresses when motion is restricted across the fused levels. This additional mechanical stress is known to contribute to a higher incidence of degeneration of adjacent segments, which could result in symptoms and the need for additional surgery in the future. The incidence of adjacent segment disease has been reported as 3% per year and a 25.6% for 10 years, but may be less of a problem in the relatively less mobile thoracic spine than in the more mobile cervical and lumbar spine [3]. The mechanical stress placed upon adjacent levels and risk of adjacent segment disease is felt to be progressively higher with more levels stabilized with fusion. Non-operative treatments for symptomatic relief of adjacent segment disease may include exercise, physical therapy, epidural corticosteroid injections, facet joint injections/ablations, spinal cord stimulation, or intrathecal therapy with an implanted pump. Thoracic epidural steroid injection may cost \$2,500 depending on the facility and can be given approximately 4 times a year if needed. Facet joint injections can be done the at the same frequency for about the same cost, whereas radiofrequency ablation typically lasts up to 12 to 18 months with a cost of approximately \$10,000. If non-invasive techniques fail then the cost of adjacent joint fusion can range from \$60,000. - \$110,000 depending on the facility. Spinal cord stimulation would likely cost close to \$100,000 for initial trial and implant, then require a battery replacement every 7-10 years costing about \$30,000 each replacement.

The treatments rendered for thoracic spine injuries included bilateral T1,2,3,4,5,6 segmental fixation and fusion, CT of thoracic spine w/out contrast, physical therapy, and occupational therapy were indeed reasonable and necessary, as were the costs of such treatments, which were provided for me on XXXX Statements. I believe within a reasonable degree of medical certainty that these injuries resulted from the accident which occurred on XX/XX/XXXX.

Right hip dislocation and acetabular fracture:

XXXX reported immediate pain of the right hip/lower leg, noted by EMS during transportation from the MVC scene. During evaluation in the ED, imaging studies demonstrated a right hip posterior dislocation and comminuted fracture of the acetabular ring. The combination of injuries is classified as type III Thompson and Epstein injury. Type III posterior dislocation and acetabular fractures have several possible long-term complications including avascular necrosis (AVN) of the femoral head, nerve injury, and post-traumatic arthritis. The incidence of avascular necrosis of the femoral head varies from 6%-40% [4,5,6]. In that XXXX underwent unsuccessful closed reduction in the Emergency Department, she required subsequent operative closed reduction with a right femoral head pinning, followed by extensive pelvis and hip reconstruction after the spinal injuries were stabilized, I would estimate she would be on the higher side of these statistical probabilities. Overall, her hip was displaced for approximately 16 hours. If avascular necrosis occurs, the end result is destruction of the hip joint, requiring total hip arthroplasty, costing an average of \$30,000 - \$45,000 depending on the facility.

XXXX is also at increased risk of nerve injury. The sciatic nerve is the most commonly affected nerve with posterior hip dislocations. During the surgical procedure by Dr. Justin Hawes on XX/XX/XX, he noted "The sciatic nerve was easily visible given the amount of soft tissue disruption posteriorly." Although the sciatic nerve was intact and visualized intraoperatively the amount of soft tissue disruption and muscular necrosis that required extensive surgical debridement would lead me to suspect a high likelihood of sciatic nerve injury. Sciatic nerve injury may cause long term neuropathic complications which may manifest over time. XXXX currently denies significant weakness or radicular pain, however there was decreased sensation to pin-prick of L5 and S1 dermatomes at the level of the right ankle. If the sciatic pain does become symptomatic, she may respond to epidural corticosteroid injections, costing up to \$2,500 depending on the facility. She may also require further PT, repeat diagnostic studies (MRI, EMG) or analgesic medications, such as gabapentin or pregabalin.

XXXX is also at an increased risk of post traumatic arthritis of the right hip due to her extensive injuries. In a cohort study of 74 simple traumatic hip dislocations, it was found that 24% of dislocated hips went on to develop osteoarthritis after 14.65 years [5,6]. XXXX's clinical condition was complicated and her risk of osteoarthritis will likely be increased significantly from the statistics quoted. There is general agreement that the more severe the initial injury the greater the chance of osteoarthritis [6]. If XXXX does develop osteoarthritis of the right hip, which I feel is a high probability; she will likely require a total hip arthroplasty in the next 10-15 years. This procedure costs an average of \$30,000 - \$45,000 depending on the facility. Until the replacement is needed, she may benefit from more conservative care including PT, repeated diagnostic studies, and intra-articular corticosteroid injections.

XXXX's greatest physical limitation at present is her antalgic gait and pain in the right hip with forward flexion greater than 80 degrees with active ROM, but no pain with passive ROM, and mild pain with weight bearing. These symptoms are likely due to a combination of muscular pain and joint pain. XXXXXreports her right lower extremity weakness is improving with physical therapy. XXXXXhad difficulty walking into the exam room demonstrating a shuffling and slow gait, but did not require assistance for ambulation. She has difficulty rising to a standing position from a seated position, and per the AMA 5th edition impairment guidelines she has class 2 impairment which would correlate to a 10%-19% impairment of the whole person. She will require further extensive physical therapy to increase her right hip strength and range of motion, likely over the next 2-3 years, with an anticipated cost of approximately \$14,400 for 3 years.

Sacroiliac joint fracture and sprain:

Her pelvic injuries included a right sacral alar fracture extending into the S1-S2 neural foramen with anterior displacement of the sacral alar relative to the right iliac bone. There was significant widening of the left sacroiliac joint. XXXXXunderwent percutaneous screw fixation of the right sacroiliac fracture/dislocation and percutaneous screw reduction/fixation of the left side of the left sacroiliac joint and treatment of left sacroiliac joint sprain on XX/XX/XX by Dr. Justin Hawes. Studies have shown excellent clinical results after sacroiliac fusion and degeneration and pain were not seen within 3 years of surgery [7]. No SI joint pathology was noted on physical exam and XXXXXdenies any residual SI joint pain symptoms. I don't anticipate any further interventions should be needed in XXXX's clinical course. Patient has reached maximum medical improvement. She may benefit from peri-articular injections if SI joints become symptomatic and limit her physical therapy progress, alternatively radiofrequency ablations may be beneficial at a similar cost for those previously noted. Requirement for SI fusion revisions is low.

Occipital Condyle Fracture/C-spine:

She sustained a slightly medially displaced left occipital condyle fracture, detected on CT of Brain/head at initial assessment in the ED. This fracture was evaluated by Dr. Reichman, and treated non-operatively with a Cervicothoracic bracing system (CTO). She wore this brace until May 2020. Examination done at the time of my assessment demonstrated ongoing limited range of motion of the cervical spine. She was able to fully flex her neck to about 45 degrees, however, her extension was limited to approximately 10-15 degrees, lateral flexion of 20-30 degrees bilaterally, and rotation of 45 degrees bilaterally, with mild to moderate pain at the point of maximal ROM. Her exam was also notable for right biceps weakness and positive Spurling maneuver provoking paresthesias following a dermatomal distribution into right arm proximally. This is concerning for ongoing nerve injury and recommend cervical spine MRI to evaluate further, potentially followed by EMG/NCS. I suspect that the initial impact from the MVC, followed

by prolonged immobilized, are likely the causative factor of these symptoms and findings. She will require further physical therapy, stretching, and massage therapy to increase her cervical range of motion. Per XXXX's billed statements it appears that physical therapy cost per day is approximately \$200-\$300/day at a rate of twice a week. I anticipate that she will require approximately 12 months of physical therapy to regain her cervical range of motion which will cost approximately \$33,600. Massage therapy would be beneficial at least weekly to relieve muscular contractures and spasms. Cost of massage therapy is approximately \$100/session weekly for 1 year is approximately \$5,000. If pain limits her ability to participate in meaningful physical therapy, or if physical therapy does not provide sufficient relief of her symptoms, she may be a candidate for additional treatment including cervical facet joint blocks, pursuant to RFA lesioning for long-term relief. Costs would be similar to those previously quoted and RFA lesioning may be required every 12-18 months.

Dysphagia:

XXXX required enteral feeding via nasojejunum tube, which replaced the nasogastric tube from XX/XX/XX - 4/30/20 due to sedation/intubation and once extubated due to failed barium swallow tests and high aspiration risks. She has been followed by speech language therapy inpatient and after discharge. Her most recent modified barium swallow test was 7/2/20, which found penetration to the level of the vocal cords with thin barium and tablet. She was cleared for a regular diet with clear liquids. She needs to take pills with puree consistency. XXXXX would benefit from continued follow up with speech language therapy and repeat barium swallow tests to ensure complete resolve of aspiration risk with swallowing pills.

Bilateral multiple rib fractures:

XXXX sustained right rib 2nd and 3rd and left rib 2-5 fractures and a sternal fracture that were treated non operatively with analgesics and rest. No further pain in the costal area on exam. She has appropriate range of motion without pain. Patient has reached maximum medical improvement.

Mild traumatic brain injury:

XXXX sustained a traumatic brain injury due to the MVC on XX/XX/XXXX. Her brain CT from XX/XX/XXXX was negative for intracranial hemorrhage, stroke or obvious mass. An EEG was performed 4/10/20 and reported as abnormal. "The sharp waves with triphasic morphology could be a nonspecific marker of encephalopathy or could confer an increased risk of focal or generalized onset seizures. The background disorganization and slowing were suggestive of nonspecific moderate to severe encephalopathy." No obvious epileptiform activity was noted. XXXX's has been working with occupational therapy to work on ability to perform activities of daily living. Mini mental status exam was 30/30 during my

examination. She was able to answer all question but did so in a delayed and cumbersome manner. I do suspect that she will continue to require extensive neurocognitive therapy due to mild traumatic brain injury. Cost of these therapies is approximately \$300 per visit and she will likely require a twice a week therapy for the first year, then weekly the second year, then as needed. I anticipate cost of at least \$50,000.

All of the opinions I have expressed in the above report are given to a reasonable degree of medical probability. I declare under criminal penalty of the State of Utah that the foregoing is true and correct to the best of my knowledge, and ability. My opinions are informed by the information available to me, and of course may be amended in the event that further information is provided.

Dated this 1 day of January, 2022

XXXX XXXXXXXX, MD

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