

Teleimaging  
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Dear Mr. Sawicki:

I have been asked to render opinion in the Kimberly Ray case. I received a B.S. degree in Biological Sciences from Stanford University, with honors in biology and honors in the humanities, and an M.D. from the George Washington University. Following this, I completed a residency in Diagnostic Radiology at the University of Arizona, serving the last year as a Fellow in Neuroradiology. Following this I entered a fellowship in neuroradiology at the Harvard Medical School, where I was promoted to faculty as an Instructor in Radiology. For the past 25 years, I have been a private practice radiologist in the Dallas area. I have been elected a Fellow in the American College of Radiology. I am board-certified in Diagnostic Radiology and neuroradiology (Certificate of Added Qualifications). I have performed thousands of injections over the past 30 years for pain control, including epidural steroid injections, facet injections, SI injections, discograms and myelograms. I am familiar with the potential complications of spinal injections, including dural puncture and hemorrhage. I am qualified to serve as an expert in this case.

I have received the following materials for review: medical records from Integrity Wellness Center; medical records from Southwest Neurophysiology; an autopsy report from American Forensics; and a deposition of Dr. Rao Mandava, M.D.

**MEDICAL RECORDS:**

Kimberly Ray (date of birth \_\_\_\_\_) underwent a rhizotomy on 4/19/21 at the left L3-4, L4-5, and L5-S1 levels, performed by Scott Houghton. Anesthesia

was performed by Mauro Molina, CRNA, supervised by Dr. Mandava, the anesthesiologist. Near the end of the procedure, the CRNA injected a combination of bupivacaine (long acting local anesthetic) and lidocaine (shorter acting anesthetic) in order to prevent post-procedure pain, for a total of 5 cc's at each operative level (L3-4, L4-5, L5-S1). Also towards the end of the procedure, there was an "event recognized" according to the procedure notes, at 13:33. One minute prior to this, a neurophysiology note recorded, "There is some sort of technical issue with the MEP levels". William High, M.D., noted "All upper MEP responses were lost just prior to flipping the patient [from prone to supine position] onto the stretcher. According to the records, the following things occurred: 13:30: "upon completion of the procedure for unknown reasons patient SPO2 decreased from 95% and heart rate to 40 from 63." "All vitals were lost and patient apneic"; 13:33: "Immediate bag mask ventilation." 13:33: "patient flipped, anesthesiologist says 'patient without spontaneous respirations.'" The patient's lips were noted to be blue after she was flipped. It was also stated in the records that the "patient obstructed and had to be flipped." 13:35: "Compressions started", 13:37: "AED applied". Procedure notes state that the patient was intubated by Molina (CRNA) at 13:35 (size 7) and re-intubated by Dr. Mandava at 13:49 (size 7.5). EMS arrived and the patient was transported to Medical City Las Colinas, and ultimately Medical City Fort Worth where the patient died at 1:30 PM on 4/23/21.

An autopsy was performed on 4/26/21. The cause of death was listed as "complications following injection procedure for pain." Complications were listed as:

- A) Spinal cord with the dura distended with serosanguinous cerebrospinal fluid.
- B) Brain edema, consistent with anoxic brain injury
- C) Focal hemorrhage on the dura
- D) History of acute arrhythmia after the procedure.

#### OPINIONS:

Kimberly Ray is an unfortunate patient who went in to an outpatient clinic for a relatively minor pain management procedure, and died a few days later from an acute loss of respiration. As someone who has performed thousands of injections for pain management over the past 30 years, I am well aware of the risks of injections in and around the lumbar spine. Towards the end of a three-

level rhizotomy procedure, the patient was reportedly still complaining of pain. At this point, anesthetic was administered consisting of both long-acting and shorter-acting anesthetics, with the desired outcome of reducing the patient's pain. Very shortly after the injections, the patient had a respiratory arrest, with blue lips noted and loss of all vitals noted on flipping the patient.

When giving anesthetic injections in the lumbar spine, there are several well-known complications, none of them life-threatening. These include nerve injury (in the lower lumbar spine), infection, and bleeding. If contrast is used, which I do not see documented in this case, contrast reaction ("allergy") is also a possible complication.

In a lower lumbar injection, respiratory arrest should simply not happen. This has been documented a number of times in the cervical spine, where brain, which is located close to the upper cervical cord. Intra-arterial injections or anesthetic placement in the upper cervical cord may cause respiratory arrest. In the lower lumbar spine, however, far away from the respiratory center in the lower brain, respiratory arrest should never happen.

There are only two potential causes of respiratory arrest in this case: the first is over-sedation by the CRNA, leading to hypoxia and loss of ventilation.

The other potential cause of respiratory arrest in this patient would be from complications arising from the injection of anesthetic into the cerebrospinal fluid, and circulation of this fluid into the brainstem region. It has been well documented in the literature that injection of anesthetic into the CSF is a known cause of respiratory arrest. In this case, the autopsy report is critical in noting a "spinal cord with the dura distended with serosanguinous [bloody] CSF", and "focal hemorrhage [blood] on the dura." These findings on autopsy provide clear evidence that the dura has been injured and that there is blood in the CSF. It is highly likely, in this case of an injured dura and blood in the CSF, that two anesthetic agents were also injected into the CSF at at least one of the 3 levels injected, if not more. Please note that, by the time the CSF was tested for the presence of anesthetic, the anesthetic would likely have been resorbed. There is no evidence that fluoroscopy was used in this case (x-ray guidance to make sure the needle was in the right place), and the autopsy demonstrates conclusively that the needle was placed too deep into the spinal canal.

It is below the standard of care for a CRNA performing a rhizotomy to injure/puncture the dura in the manner described in the autopsy report, causing bleeding in the CSF. The standard of care requires medical professionals

performing this procedure to take adequate steps to avoid injuring the dura and to monitor the location of their injections to avoid this injury. This may be done using fluoroscopy, or documenting the "loss of resistance" technique if epidural injection is intended. In this case, CRNA Houghton violated the standard of care when he caused the injury described in the autopsy report.

It is my opinion that, more likely than not and in reasonable medical probability, barring evidence of anesthetic over-sedation, CRNA Scott Houghton injected anesthetic directly into the CSF, causing respiratory arrest and sudden death. Had not Mr. Houghton injected the anesthetic, the patient would not have suffered irreversible brain death and would have had a normal recovery from the procedure. I reserve the right to modify these opinions should additional information become available.

Sincerely,

  
Kendall M. Jones, M.D., FACR