



Michigan Medicine
Pathology and Clinical Laboratories
1500 East Medical Center Drive
Ann Arbor, MI 48109
(734) 936-6700

Last Name: SMITH
First Name: JOHN
MRN: 123456789
Sex: Male Age: 46 Y DOB: 11/1/1973
Physician: WILSON, ALLECIA
Location: AUTOPSY

POSTMORTEM EXAMINATION REPORT

Order Number: AU-20-725 ME Case #: 47-20-135

Date of Death: 4/15/2020 1:35:00 PM
Date and Time of Autopsy: 4/17/2020 8:00 AM
Date Completed: 5/4/2020 4:57 PM
Place of Autopsy: Michigan Medicine Morgue

Cause of Death:

Fentanyl and Cyclobenzaprine Toxicity

Manner of Death:

Accident

Final Diagnosis:

I. No acute natural disease

II. Toxicology

- 4-ANPP Positive ng/mL 001 - Iliac Blood
- Caffeine Positive mcg/mL 001 - Iliac Blood
- 7-Amino Clonazepam 9.2 ng/mL 001 - Iliac Blood
- Duloxetine 210 ng/mL 001 - Iliac Blood
- Ritalinic Acid 120 ng/mL 001 - Iliac Blood
- Quetiapine 380 ng/mL 001 - Iliac Blood
- Venlafaxine 920 ng/mL 001 - Iliac Blood
- O-Desmethylvenlafaxine 1100 ng/mL 001 - Iliac Blood
- Zolpidem 48 ng/mL 001 - Iliac Blood
- Gabapentin 9.4 mcg/mL 001 - Iliac Blood
- Cyclobenzaprine 190 ng/mL 001 - Iliac Blood
- Fentanyl 28 ng/mL 001 - Iliac Blood
- Norfentanyl 7.1 ng/mL 001 - Iliac Blood
- Benzodiazepines Presump Pos ng/mL 005 - Urine
- Fentanyl / Metabolite Presump Pos ng/mL 005 - Urine

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Clinical History:

The decedent was a 46 year old male with a medical history of chronic back and neck pain. The decedent had not reported any clinical symptoms or signs that he had not been feeling unwell recently. The decedent had been treated with cyclobenzaprine and fentanyl patches for his back pain. Pill counts of his cyclobenzaprine suggest there may have been an amount that was unaccounted for at the time of his death. According to the decedent's wife, the decedent went to bed around 0030 on 4/15/20. He ended up on the floor which was not unusual for him due to his chronic back pain. The wife reported going down stairs initially after waking. She then later returned upstairs to awaken the decedent but found him unresponsive and called 911. Livingston County EMS and state police arrived at the scene. The decedent was then pronounced dead at 1335 with no resuscitation attempt performed.

- Place of Autopsy: Michigan Medicine Hospital Morgue
- Pathologists: Geoffrey Halling MD (pathology resident); Allecia Wilson MD (staff pathologist)
- Autopsy Assistant: Monique Micallef
- Autopsy Authorization: Permission for autopsy is given by Livingston County Sheriff's Department.
- Autopsy Restrictions: None.
- Photographs: Photographs taken during this autopsy by Lisa Neal.
- Identification: The body is identified by a hospital toe tag.
- Clothing: 1 pair of plaid boxershorts, 2 black socks, 1 pair blue sweatpants, 1 blue tee shirt.
- Property: Recovered from the body at the time of autopsy are the following items: None.

External Examination:

The body is that of a well-developed, well-nourished male who appears consistent with the reported age of 46 years. The body weighs 198 pounds and measures 70 inches in length. The body mass index is 28.4 kg/m2. The body is well preserved. The unembalmed body is cool to touch from refrigeration. Rigor mortis is fixed in the extremities. There is fixed purple lividity over the posterior surfaces of the body, except in areas of pressure.

Skin: The skin is remarkable for several well healed surgical scars including: 0.5 cm scar over the right mid-frontal area of the scalp, 4 cm horizontal scar over the right lower abdomen, and a 2.5 cm scar over the dorsal wrist. There scalp and face have some dried and crusted areas potentially representing eczema. There is a 100 microgram fentanyl patch over the sternum.

Head: The head is normocephalic.

Hair: The head is shaved on top with growth on the posterior surface. It is gray/black in color and measures up to 0.5 cm in length.

Eyes: The irides are brown. The sclerae are white. There are no petechiae within the palpebral or bulbar conjunctiva.

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Ears: The ears are normal.

Nose: The septum is midline. There are no perforations.

Oral Cavity/Mouth: The anterior teeth are natural and in a fair state of repair.

Face: The face is unremarkable.

Neck: The neck organs are in the normal midline position. The thyroid gland is not palpable.

Chest: The chest has a normal anteroposterior dimension. Nipples and breasts are symmetrical and are those of a male. There are no palpable masses.

Abdomen: The abdomen is flat.

Genitalia: The external genitalia are those of an adult male.

Anus: The anus is unremarkable.

Extremities:

Lower Extremities: The lower extremities are well developed and symmetrical. The nails are well trimmed. There is no edema or discoloration present.

Upper Extremities: The upper extremities are well developed and symmetrical. The nails are well trimmed. There are no puncture wounds present.

Back: The back and sacrum are unremarkable.

Identifying Marks and Tattoos: Tattoos include:

Evidence of Therapeutic Intervention:

None.

Evidence of Trauma:

None.

Internal Examination:

Body Cavities: The peritoneal surfaces are smooth and glistening. There are no adhesions, effusions or hemorrhage present. The pleural cavities are smooth and glistening. There are several small areas of adhesion on the posterior pleural surface bilaterally. There are no effusions or areas of hemorrhage. The diaphragms are intact. The ribs are

MRN: UX00902214
Last Name: SORENSEN
First Name: RANDY

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intact and without fracture. The pericardium is smooth and glistening and contains 10 mL serous fluid. The subcutaneous fat measures 3 cm at the level of the umbilicus. The skeletal muscle has a normal dark-brown color and normal smooth texture.

Heart: The heart weighs 350 grams. The heart has the normal configuration. The epicardial surfaces appear unremarkable. The coronary ostia are in their normal configuration and widely patent. The coronary arteries have a normal distribution with a right dominant system. On serial coronal sectioning, there are no areas of atherosclerosis, calcification, or thrombosis. The valve leaflets are thin, pliable and competent and free of vegetations. The heart valves have the following measurements: Tricuspid 11.0 cm, pulmonic 8.0 cm, mitral 10.5 cm, and aortic 7.0 cm in circumference. The left ventricle measures 0.8 cm, the interventricular septum 0.7 cm, and the right ventricle 0.3 cm in thickness measured 1.0 cm below the respective atrioventricular valve annulus. The endocardial surface is free of fibrosis. The trabeculae carne and papillary muscles are unremarkable. The myocardium has the normal reddish brown color and consistency. There are no areas of fibrosis or scarring.

Aorta: The aorta has a normal configuration without aneurysmal dilatation. The intimal surface has the normal yellow coloration and is free of atherosclerosis. The ostia of the major branches including the celiac, renal, superior and inferior mesenteric arteries are widely patent.

Lungs: The right and left lungs weigh 580 and 510 grams, respectively. There is normal septation. There is mild anthracosis. On cut surface, the parenchyma is congested. There are no areas of consolidation, masses or abscesses present. The trachea and main stem bronchi appear normal without foreign bodies, masses, or mucus. Hilar lymph nodes are not enlarged. The pulmonary arteries are free of thrombi.

Liver and Biliary Tract: The liver weighs 1790 grams. The capsule is intact, smooth and glistening. The parenchyma has the normal reddish-brown color and soft texture. There is no nodularity, masses, or hemorrhage present. A thin-walled gallbladder is present and contains thick, viscous bile. No calculi are present.

Pancreas: The pancreas has a normal size, shape and tan lobular appearance.

Adrenal Glands: The adrenal glands have normal cut surfaces with yellow cortex and gray medulla. There is no nodularity present.

Spleen: The spleen weighs 260 grams and has a smooth intact capsule with normal, firm reddish-brown parenchyma. There are no infarcts, nodules, scars or cysts present.

Gastrointestinal Tract: The esophagus has the normal gray-white smooth mucosal surface. The gastroesophageal junction is unremarkable. The gastric mucosa has the normal rugal folds and the lumen contains a moderate amount of partially digested food material. There are no pill fragments noted. The small bowel has the normal configuration and contains semi-liquid, green-yellow stool. No appendix is appreciated grossly. The colon has the normal uniform dimension and contains formed, green-yellow stool. There are no diverticula or masses present.

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Genitourinary Tract: The right and left kidneys weigh 110 and 120 grams respectively. The renal capsules strip with ease. The cortical surfaces have the normal reddish-brown color and smooth texture. There are no infarcts, nodules, scars or cysts present. There are no calculi present. The ureters are uniform in dimension and patent to the bladder. The bladder is distended with a moderate amount of clear, straw-colored urine. The bladder mucosa is gray-tan and smooth. The prostate has a normal size. There are no areas of nodularity or discoloration present.

Musculoskeletal: The thoracolumbar spine has the normal configuration. There is a small vertebral osteophyte noted on one right lower thoracic vertebral body. The remaining vertebral bodies are normal without degenerative spurring or lipping. The cervical spine is stable. The bone marrow has a normal dark red coloration. No lesions are noted.

Neck: The neck musculature has no hemorrhages present. The hyoid and thyroid cartilages are intact, without fracture or hemorrhage. The laryngeal mucosa is unremarkable. The cords are symmetrical. The thyroid gland has a normal position and reddish tan color and normal texture. There are no cysts or nodules present.

Central Nervous System: The scalp has no subgaleal hemorrhages. There is a small 0.3 x 0.3 cm burr hole over the mid-frontal region of the skull, corresponding to the previously mentioned scar on the scalp. The remaining skull is intact with a normal thickness and without fracture. The dura is intact. There are no epidural, subdural, or subarachnoid hemorrhages present. There are multiple small masses on the dural surfaces including a 0.5 x 0.5 area in the right mid-frontal region, as well as several smaller masses over the superior sagittal region. The masses are hard in consistency and potentially calcified.

Brain: The brain weighs 1430 grams and the hemispheres are symmetrical with a normal gyral pattern. The cranial nerves are intact and symmetrical. The vessels at the base of the brain have a normal configuration and are free of atherosclerosis. The cerebellar tonsils and uncus gyri appear normal and without herniation or grooving. The pituitary gland is normal. Serial coronal sections through the brain reveal no evidence of hemorrhage or contusions within the cortex, white matter, midbrain, pons or cerebellum.

Spinal cord: The spinal cord is not examined.

Additional Studies:

Radiology:

None.

Specimens Retained:

- Representative tissue for histology and stock
- Specimens for toxicology: iliac blood, urine, vitreous fluid, liver
- Body and property photographs
- DNA card
- Fingerprint

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Evidence Collected:

None.

Toxicology Results:

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- Benzodiazepines Presump Pos ng/mL 005 - Urine
- Fentanyl / Metabolite Presump Pos ng/mL 005 - Urine

Microscopic Description:

The heart has myocyte hypertrophy. The lungs show congestion, emphysematous changes and intraalveolar macrophages. The liver is congested. The kidneys have red blood cell casts and few sclerotic glomeruli.

Microscopic Slide Index:

- Slide A1: Left Ventricle
- Slide A2: Interventricular septum
- Slide A3: Right ventricle
- Slide A4: Lung
- Slide A5: Liver
- Slide A6: Spleen
- Slide A7: Kidney
- Slide A8: Dural masses
- Slide A9: Dentate nucleus
- Slide A10: Hippocampus

Autopsy Summary:

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Autopsy Summary:

Fentanyl is a DEA Schedule II synthetic morphine substitute anesthetic/analgesic. It is reported to be 80 to 200 times as potent as morphine and has a rapid onset of action as well as addictive properties. Signs associated with fentanyl toxicity include severe respiratory depression, seizures, hypotension, coma and death. In fatalities from fentanyl, blood concentrations are variable and have been reported as low as 3 ng/mL.

In consideration of the autopsy findings and the circumstances surrounding this death, the manner of death is classified as Accident.

Electronically Signed By:

Allecia M. Wilson, M.D.

I, the above named pathologist, have personally examined and interpreted the slides from this case.

House Officer(s):

GEOFFREY HALLING

Laboratory Accrediting Agency Compliance Statement:

If immunostain testing was performed on this case, the testing was developed and the performance characteristics were determined by the University of Michigan Clinical Immunoperoxidase Laboratory. It has not been cleared or approved by the U.S. Food and Drug Administration. (The FDA has determined that such clearance is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research.) Appropriate negative and positive controls were run and demonstrated expected results. Most antibodies (including ER, PR, and HER2/neu) were not validated on decalcified tissues; negative staining on decalcified specimens should therefore be viewed with discretion, as a falsely negative result cannot be excluded. The Coreo ACIS instrument (if used for any test on this case) is FDA approved.

Performing site:

ULAB University of Michigan Hospitals, Main Medical Campus
 1500 E Medical Center Dr
 Ann Arbor, MI 48109

CLIA Director: Riccardo Valdez, MD

CLIA Number: 23D0366712

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