FORENSIC AUTOPSY REPORT
CASE NUMBER: 17

Name of the Decedent: Dr. Elena Marek
Age: 28
Sex: Female
Date and Time of Autopsy: 2025-5-11, 5:06 P.M.
Time of Discovery: 2025-4-11, 1:00 P.M.
PMI: 10-12 hours prior to discovery.
Performed By: R. Amisa, Medical Trainee under Supervision, Moncton Medical Center
Location of Autopsy: Forensic Pathologist Lab, University Medical Teaching Hospital
Authority Requesting Autopsy: Office of Medical Examiner

Summary of Case:

The decedent, a postgraduate researcher in chronobiology, was discovered inside a university cold chamber used for circadian rhythm experiments, lying supine on floor. No visible sign of struggle or violence.

Evidence / Observations from Scene:

- A digital wall clock beside her, stopped exactly at 2:47 a.m. despite power still running in the lab.
- A portable EEG headset still on her head, connected to a laptop displaying continuous brainwave data — which abruptly flatlined at 2:47:12.
- A handwritten note pinned to corkboard— “The time was wrong.”
- Entered the cold chamber alone at ~10:30 p.m., logging into the EEG system.
- Last lab video footage shows her adjusting the temperature and EEG devices while glancing at the digital clock frequently.

Environmental Data:

- Cold floor room (set to 3°C).
- Chamber humidity: 28%
- Keycard logs show only Elena entering that night.
- Power fluctuations recorded by building maintenance between 2:40–2:50 a.m.

External Examination:

- **Identifying Information**

    a. **Apparent Sex:** Female.
    b. **Height:** 5'5" / 167 cm.
    c. **Weight:** 130 Ibs/ 59 kg.
    d. **Build:** Well-nourished and medium build.
    e. **Ethnicity:** Causasian.

- **Clothing:**
    a. **Outergarments:**
        ➔ Clad in partially unbuttoned white laboratory coat.
        ➔ A light gray blouse.
        ➔ Dark trousers rolled up to mid-calf.
        ➔ Disposable latex gloves on both hands.
    b. **Undergarments:** Present.
    c. **Feet:** Absent.
    d. **Accessories:** None.

- **Condition of the Body**

    a. **Rigor mortis:** Well developed and fixed in all major muscle group.

b. **Lividity:** Present on porteior area, fixed, deep-purple in color; consistent with supine position.

c. **Algor Mortis:** The core body temperature, at the time of initial examination was 14.2 °C, inconsistent with environmental temperature and extimated time of death.
d. No sign of putrefaction is observed.

- **Skin:** No external injuries or contusions are present.

- **Head and Face**

    a. **Hair:** Light brown, shoulder-length, and slightly damp from condensation.
    b. **Eyes:** The pupils are mid-dilated, approximately 4 mm bilaterally. No conjunctival petechiae.
    c. **Lips and earlobes:** Pale with mild cyanosis. No trauma.
    d. **Nails:** Short, free of debris. No evidence of struggle.
    e. **Dentition:** Intact, no recent dental work.

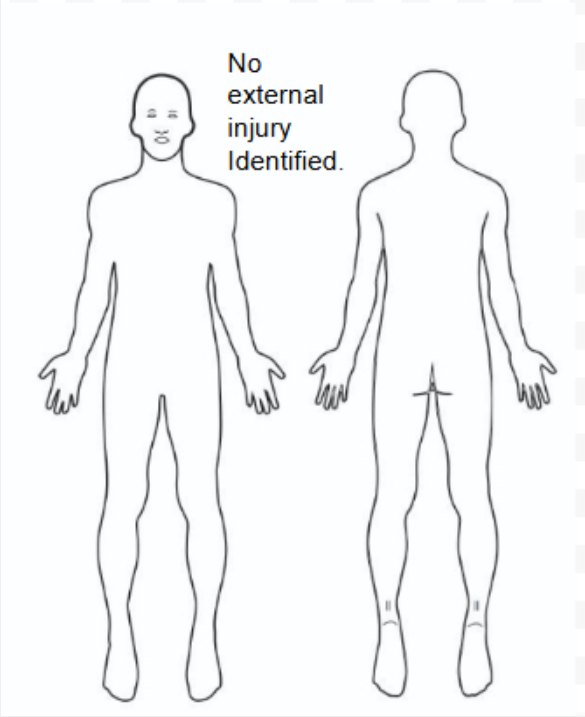
- **Neck:** No ligature mark present. No palpable swelling or fractures.
- **Chest and Abdomen:** The chest is symmetrical with no external trauma, punctures, or abrasions. The abdomen is flat and soft to palpation. Breasts are unremarkable. No external markings or scars.
- **Back:** Uniform lividity. No evidence suggesting movements after death.
- **Genitalia and Anus:** External genitalia are unremarkable. No evidence of recent sexual activity or trauma.

- **Limbs**

    a. The fingertips show mild pinkish discolouration consistent with cold exposure.
    b. Fingernails are intact, short, and clean. No defensive wounds or foreign material identified beneath the nails.
    c. The plantar surfaces display patchy erythema and faint marbling consistent with early cold-induced vasoconstriction.
    d. No frostbite or trauma.
    e. No needle/ injection marks observed on any limb.

- **Other Distinguishing Features**

    a. A healed appendectomy scar (3.5 cm) in the right lower quadrant.
    b. A small crescent-shaped scar (0.8 cm) on the left forearm.
    c. No tattoos or piercings.



Summary Comment:

No evidence of trauma, struggle, or defensive activity identified externally. Postmortem changes indicates that the body remained undisturbed/ untouched. The presence of mild erythema and inconsistent cooling likely suggests that sudden physiological failure prior to hypothermic decline.

Internal Examination:

- **Head and Neck:**

  - ➔ **Scalp/ Skull:** Normal size and shape. No fractures, depressions, or external trauma.
  - ➔ **Brain:** Mildly edematous. Cortical gyri slightly flattened; sulci narrowed. Hippocampus display mild atrophy. No hemorrhage, contusions, or infarcts. Ventricular system is normal in size.
  - ➔ **Cranial Nerves:** Unremarkable.
  - ➔ **Neck Structures:** No fractures of hyoid bone or thyroid cartilage

- **Throrax:**
  - ➔ **Heart:** Normal size and shape; coronary arteries patent; no thrombi, myocardium appears normal; valves intact.
  - ➔ **Lungs:** Mild congestion with patchy petechiae in lower lobes. No embolism.
  - ➔ **Pleura:** Normal.
  - ➔ **Pericardium:** Smooth, no effusion.
  - ➔ **Ribs/ Thoracic cage:** No trauma/ fractures.
- **Abdomen:**
  - ➔ **Liver:** Mildly congested.
  - ➔ **Spleen:** No abnormalities.
  - ➔ **Pancreas:** Normal.

➔ **Kidneys:** Mild congestion, no lesions.
➔ **Stomach:** Unremarkable. No sign of ulceration or hemorrhage,
➔ **Intestine:** Normal.

- **Genitourinary System:** Uterus, ovaries, and fallopian tubes grossly normal.
- **Musculoskeletal System:** Unremarkable. No sign of hemorrhage, trauma, or injection sites. No deep injury identified.

Table 1.

Organ	**Weight**
Brain	1,360 g
Heart	310 g
Right lung	520 g
Left lung	480 g
Liver	1,460 g
Spleen	160 g
Right kidney	130 g
Left kidney	130 g
Stomach	150 mL (partially digested food; last meal estimated 2-3 hours prior to death.)
Bladder	200 mL of clear yellow urine

Toxicology Report:

Specimen Received: Femoral blood, vitreous humour, urine, and liver tissue were submitted.

Analytical Findings:

- ➔ **Alcohol:** Negative.
- ➔ **Common Drugs of Abuse**: Negative for cannabinoids, benzodiazepines, barbiturates, cocaine.
- ➔ **Prescription drugs:** None detected above therapeutic level.
- ➔ **Other Toxicants:** No cyanide, carbon monoxide, or heavy metal detected.

Interpretation: Toxicology does not appear to the primary cause of death. No evidence or foul play via chemical agents.

Histological Examination:

- ➔ **Brain sections:** Mild hippocampal neuronal shrinkage, no acute ischemic changes.
- ➔ **Heart sections:** Minimal fibrotic changes in left ventricle.
- ➔ **Lungs:** Mild pulmonary edema and petechial hemorrhage.
- ➔ **Liver, kidney, spleen:** Unremarkable.

Interpretation:

No major trauma. Mild cerebral edema and hippocampal atrophy may reflect underlying chronic stress or sleep deprivation. Mild pulmonary edema and petechiae may indicate sudden cardiovascular or neurological event. Toxicology does not appear to the primary cause of death.

History:

- ➔ **Research obsession:** Used to be involved in a high-risk experiment involving the modulation of circadian rhythms through controlled cold exposure combined with prolonged EEG monitoring for long (8-10 hrs) duration.
- ➔ **Sleep deprivation:** In the week prior to death, colleagues reported her sleeping for 3-4 hours per night.
- ➔ **Physical strain:** Complained occasionally of palpitations and dizziness but dismissed them, attributing them to "data fluctuations."
- ➔ **Unusual behavior:** Repeated mentions or writing of lines about the clock, time, or sleep phase being wrong.

Discussion:

The decendent, a 28-year old female researcher, was discovered in a university cold chamber used for circadian rhythm experiments. Scene investigations found no evidence of struggle/ foul play.

External examination revealed no sign of trauma or movements after death. Internal examination reveals no trauma sufficient to cause death. But they were consistent with chronic stress, prolonged period in cold environment, and indicators of sudden neurological/ cardiovascular events leading to death. Toxicology revealed no substance identified to be independently lethal.

The combination of prolonged stress, sleep deprivation (History supported by internal examination findings), mild pulmonary petechiae and edema supports sudden physiological failure.

Besides, the power fluctuations in the building could have caused a sudden surge or drop in the EEG device or other instrument, sending unexpected electrical currents to the device

she was connected to. Sudden voltage changes, even if not fatal on their own, could have caused localized stimulation in her nervous system. They likely triggered sudden cardiac stress or neurogenic pulmonary edema. It resulted fatally in a combination of cold-room, stress on cardiovascular system, and extreme sleep deprivation.

Based on the integration of external, internal, toxicological, and scene findings, death is most consistent with neurological cardiovascular collapse.

Cause of death: Neurological cardiovascular collapse.
Mechanism of Death: Acute neurological insult → Sympatho-parasympathetic imbalance → Arrhythmias→ Sudden cardiovascular collapse
Manner of Death: Accidental

Evidence Supporting Accidental:

- Her obsession and cognitice tunnel vision rationalized signs of danger as part of the experiment, not willing to stop.
- Chronic sleep deprivation increased the risks of arrhythmias, heart attacks, strokes, and immune failure.
- Increasingly isolated for the sake of her work.
- Blurred the lines between professional experiment and danger.
- No evidence of any other person involved or diseases/ trauma independently strong enough to cause death.

Signature

Medical Trainee under Supervision

5th November 2025

Author's Note: This mock autopsy report is based on a fictional case scenario generated using AI, as I do not have access to real forensic cases. The analysis, biological reasoning, and report structure were developed independently by me. This piece reflects my interest in forensic pathology and my effort to understand mechanisms of death through structured, scientific writing.