2009 – 11049

REPORT OF POSTMORTEM EXAMINATION

NAME	Darcy Allan SHEPPARD
AGE	33 years
SEX	Male
AUTOPSY NUMBER	A 899-09
MORGUE NUMBER	M # 2744/357
CORONER	Dr. M. Shaffer
DATE OF AUTOPSY	September 1, 2009
RESIDENTS & FELLOWS	Dr. Michael Pickup Dr. Charis Kepron Dr. Lalitha Gunapalan Dr. Bojana Mitrovic
PATHOLOGIST'S ASSISTANTS	Emily Coleman Peter Lewis
FORENSIC IDENTIFICATION OFFICER	Gurjot Kang (#1995)
INVESTIGATOR	Jeff Vance (# 4)

CAUSE OF DEATH

1(a) BLUNT IMPACT HEAD TRAUMA

QUALIFICATIONS

My name is Michael Sven Pollanen. I qualified in Medicine from the University of Toronto in 1999 (MD). In 1999, I commenced postgraduate training in anatomical and forensic pathology. In 2003, I became a Fellow of the Royal College of Physicians and Surgeons of Canada by examination in Anatomical Pathology (FRCPC). I was appointed as a member (MRCPath, 2001) and later fellow (FRCPath, 2009) of the Royal College of Pathologist of the United Kingdom by published works. I gained specialty qualification in forensic pathology, the Diploma in Medical Jurisprudence (Pathology) in 2002 [DMJ(Path)]. My other degrees include a BSc (1992) and a PhD in pathology (1995).

In 2003, I was appointed as a forensic pathologist in Toronto and an Associate Professor at the University of Toronto. I was appointed the Chief Forensic Pathologist in Ontario in 2006. In 2009, at the proclamation of the Amended Coroners Act, I was named the Chief Forensic Pathologist under the legislation by the Lieutenant Governor. I am the Founding Program Director for the forensic pathology residency at the University of Toronto, and the Founding Director of the Centre of Forensic Science and Medicine at the University of Toronto. I have published widely on topics in pathology and forensic pathology and have an active research program in experimental forensic pathology. I review papers for medical journals and am on the editorial boards for the journals: *Forensic Science International* and *Forensic science, medicine and pathology*.

I am a member of Royal College of Physicians and Surgeons specialty committee on forensic pathology. I have acted as an external examiner in forensic pathology and as a consultant in forensic pathology to national and international organizations including the United Nations, Canadian International Development Agency, the International Criminal Court and non-governmental human rights organizations.

As Chief Forensic Pathologist for Ontario, I both perform autopsies and have statutory responsibilities to supervise and direct the Ontario Forensic Pathology Service, which provides and oversees all medicolegal autopsies in Ontario (~7,000 autopsies per year). I am widely consulted by both the prosecution and defence and regularly give evidence in criminal trials, mostly for the prosecution. I have also testified for the defence, including in two cases in the Ontario Court of Appeal.

DECLARATION

I understand that my overriding duty is to the court, both in preparing reports and in giving oral evidence. I have complied with and will continue to comply with that duty. I have done my best, in preparing this report, to be accurate and complete. I have mentioned all matters that I regard as relevant to the opinions I have expressed.

PRE-AUTOPSY INFORMATION

1. Prior to postmortem examination, information about the case is provided to me by the Investigator in attendance at the postmortem and review of the Warrant for Postmortem Examination.

2. This 33-year old man was a cyclist on a bicycle when he was struck from behind by a convertible car.

3. He fell to the ground and then apparently got up from the ground. As the convertible car was continuing down the roadway, the decedent apparently grabbed onto the headrest of the driver's seat.

4. Thereafter, the convertible car crossed the median into opposing traffic and then mounted a sidewalk. The car continued with the decedent still holding onto the headrest of the car. The car apparently glanced off of a tree and a fire hydrant and ultimately struck a mailbox where the decedent was then apparently thrown to the ground in the curb lane.

5. EMS attended and transported the decedent to hospital where he was pronounced dead. Review of the ambulance call report indicates that this man was found lying prone on the roadway with a Glasgow Coma Score of 3. There was blood emerging from the right ear and nose. At the time of initial assessment by EMS, there was a weak radial pulse which progressed to asystole. When brought to hospital, there was pulseless electrical activity and death was pronounced despite supportive measures.

6. Review of medical records shows that a blood alcohol level upon admission to hospital was 47.4 mmol/L.

IDENTIFICATION AND CONTINUITY

1. The body is received in an intact sealed white body bag bearing seal number 1330397.

2. There is an identification band signed by the Coroner on the right wrist.

PROCEDURES

1. The Forensic Identification Officer has obtained photographs.

2. A standard external and internal examination is performed.

EXTERNAL EXAMINATION

GENERAL DESCRIPTION

1. Inside the body bag is the nude body of a well-nourished and well developed 6'1" and 203 lb adult male. The weight is increased by blankets and paraphernalia.

2. The body shows evidence of medical intervention in the form of a bandage wrapped around the head, an endotracheal tube (properly positioned), a hard cervical collar, a plastic mouth guard, EKG tabs pasted to the thorax, a right subclavian cannula, right intravenous cannula over the biceps, an intravenous cannula in the right groin, an intravenous cannula in the left cubital fossa, bilateral chest tubes emerging from the lateral aspects of the chest. The drains of the chest tubes are empty. The various cannulae are attached to saline, O Rh + blood product, and saline with norepinephrine. There are bilateral needle thoracostomy punctures on the front of the chest. Therapeutic needle punctures are present in the femoral regions and the extremities.

3. Personal effects consist of a green rubber bracelet on the left wrist.

4. Rigor mortis is present. Postmortem hypostasis is dorsal.

HEAD AND NECK

1. The hair has been partially shaven at the sides and is present at the midline and is black.

2. There is a neatly trimmed beard and mustache.

3. The irides are green.

4. The conjunctivae are pale and free of petechiae.

5. There is focal scleral and conjunctival hemorrhage involving the right lateral canthus region.

6. On the posterior aspect of the right scalp, adjacent to the ear is an obliquely oriented 4.5 cm scar. The left posterior scalp shows punctate to linear scars.

TORSO

1. There are scattered punctate hypopigmented scars of the chest and stretch marks over the biceps.

EXTREMITIES

1. There are callouses on the palms of the hands.

2. There is a vertically oriented 8 cm scar on the lateral aspect of the right leg just above the ankle.

3. There is a 2 cm fading (healing) brown bruise of the left thigh.

4. There is a scabbed (healing) grazed abrasion of the right dorsal forearm.

5. There are scattered, well healed, ulcer-type scars of the legs.

EXTERNAL GENITALIA AND PERINEUM

1. No injuries.

SIGNS OF INJURY

1. HEAD

External injuries

- 18 x 15 cm geographic grazed abrasion of the right side of the face, head, and forehead with fragmentation of the skin and cartilage of the right ear and a 8 cm irregular stapled laceration of the right lateral scalp.
- 1.2 cm vertical laceration of the left lower lip.
- 3.2 x 0.9 cm abrasion of right chin
- 1.5 cm partially thickness laceration of the left vertex of the head
- 1.5 x 1 cm red bruise of the left upper cheek
- 3 x 1 cm red abrasion of left lower face
- 2 cm vertical laceration of the posterior surface of the left ear.
- Patchy red 'raccoon-eye type' discolouration of right upper eyelid and blood dripping from the left ear [Comment: secondary to basal skull fracture].

Internal injuries

- 18 x 17 cm subscalp contusion extending from the frontal to the occipital area.
- 8.5 x 7 cm depressed fracture of right parietal and temporal bone with an incomplete C-shaped outer circumference defined by an irregular fracture line. The depressed fracture is underneath the grazed abrasion of the right face and head; there is also marked subscalp contusion. The depressed fracture continues into a hinge fracture of the skull base.
- There is a widely displaceable hemorrhagic hinge basal skull fracture involving both petrous temoporal bones and the sella turcica. There are radiating fractures into sphenoid bone and sphenoid sinus and the floor of left middle cranial fossa.
- A separate small Y-shaped basal skull fracture is present in the floor of the posterior fossa on the left side near the foramen magnum.
- There is complete transaction of the left mid-pons. There are extensive multifocal traumatic pontomedullary and midbrain hemorrhages surrounding the laceration.
- There is widespread acute subarachnoid hemorrhage of the lateral aspect of the left cerebral hemisphere, over the cerebral convexities and over the inferior surface of the left frontal and temporal lobes.
- There is fluid blood in the lateral ventricles.

2. NECK

- There is a cluster of 0.5 – 2 cm abrasions on the lateral aspect of the left neck extending from the mastoid to the lower neck.

3. SIDE AND BACK OF THE TORSO

External injuries

- 17 cm C-shaped avulsive laceration with skin flap on the left side of the torso situated 120 cm from the heel. The upper and medial margin has an abrasion and there is a deep subcutaneous avulsion pocket directed downward.
- 9 x 8 cm cluster of abasions and petechial intradermal bruises over left upper scapular area.
- 6.5 x 2 cm abrasion over right posterior shoulder with focal satellite abrasions.

Internal injuries

- Hemorrhagic fractures of the posterior portion of the left 9^{th}-11^{th} ribs.
- Hemorrhagic fracture of the lateral portion of the right 3^{rd} rib.

4. UPPER EXTREMITIES

- 1.6 x 1 cm intermittent petechial bruise of the left upper arm near axilla (armpit).
- Two grazed abrasions (total area = 4.5 x 3.5 cm) over right elbow.
- 30 x 6 cm cluster of intermittent abrasions from the left upper arm to the distal forearm.

5. HANDS

- Scattered 0.1-2 cm abrasions of the dorsum of the left hand, ring finger and last finger.
- 0.5 cm abrasion over knuckle of right middle finger and 1.5 cm abrasion over dorsum of right wrist.

6. LOWER EXTREMITIES

- 2.4 x 1 cm abrasion of the right hip/lateral thigh (99 cm above the heel).
- 2.2 x 1.7 cm abrasion of the left hip/lateral thigh (93 cm from heel).
- 0.5 cm abrasion on anterior aspect of right thigh.
- 3 x 1.9 cm cluster of abrasions on front of left knee.
- 3.8 x 2.5 cm and 1 x 0.6 cm abrasions of lateral aspect of left foot.

INTERNAL EXAMINATION

BODY CAVITIES

PERICARDIUM & CAVITY	Unremarkable and dry.
PLEURA & CAVITIES	Chest tubes are *in situ* in both pleural spaces and there is a trace amount of blood associated with the entry sites.
PERITONEUM & CAVITY	Unremarkable and dry.
DIAPHRAGM	Unremarkable.
RETROPERITONEUM	Unremarkable.

CARDIOVASCULAR SYSTEM

HEART (WEIGHT)	440 g.
CORONARY ARTERIES	No significant atheroma.
ATRIA & VENTRICLES	Unremarkable.
CARDIAC VALVES	Unremarkable.
MYOCARDIUM	No acute infarcts, scars, or hypertrophy.
AORTA	No significant atheroma.
INFERIOR VENA CAVA	Unremarkable.

NECK AND RESPIRATORY SYSTEM

TONGUE & SOFT TISSUES	No hemorrhages.
HYOID BONE & LARYNX	Not fractured.
TRACHEA, BRONCHI & CARINA	Extensive fluid blood is present.
LUNGS	Right – 740 g; Left – 560 g. There is patchy hemoaspiration, edema and congestion. There are no lacerations or contusions.

DIGESTIVE SYSTEM

ESOPHAGUS	Unremarkable.
STOMACH CONTENTS	Present.
GASTRIC MUCOSA	Unremarkable.

INTESTINES	Not obstructed or perforated.
VERMIFORM APPENDIX	Present.
LIVER	1860 g; Unremarkable; not cirrhotic or fatty.
GALL BLADDER	Present.
PANCREAS	Unremarkable.

GENITOURINARY SYSTEM

KIDNEYS	Right – 180 g; Left – 200 g. Unremarkable.
URINARY BLADDER	Urine is present.
PROSTATE GLAND	Unremarkable.

MONONUCLEAR-PHAGOCYTE SYSTEM

SPLEEN	200 g; Unremarkable.
LYMPH NODES	Not enlarged.

MUSCULOSKELETAL SYSTEM

BONES	See above.
SKELETAL MUSCLES	Unremarkable.

ENDOCRINE SYSTEM

PITUITARY GLAND	Not examined.
THYROID GLAND	Unremarkable.
ADRENAL GLANDS	Unremarkable.

HEAD AND CENTRAL NERVOUS SYSTEM

SKULL	See above.
SCALP	See above.
BRAIN	See above.

ANCILLARY STUDIES (in brief)

EXHIBITS AND SAMPLES

1. All physical exhibits have been transferred into the custody of the Forensic Identification Officer at the conclusion of the autopsy. The following exhibits were collected:

Seal Number	Exhibit
2L17496	Tube of femoral blood in preservative
2L17495	Tube of mixed heart blood in preservative
2L17494	Tube of urine in preservative
2L17491	Jar of stomach contents
2L17492	Tube of blood – EDTA
2L17493	Blood transfusion tubing

TISSUE AND ORGAN RETENTION

1. Small samples of major tissues are stored in formalin and used to prepare histologic sections.
2. No whole organs are retained.

TOXICOLOGY

1. Antemortem blood samples have been requested from hospitalization.
2. Toxicologic samples were analysed at the Centre of Forensic Science.
3. The main postmortem toxicologic findings are: ethanol: 183 mg/100 mL of blood and the presence of cannabis-related metabolites.

HISTOLOGY

Tissue	Microscopic findings (in brief)
HEART	Unremarkable.
LUNG	Patchy acute intra-alveolar hemorrhage and occasional fat emboli. There is underlying changes in the lung with moderate chronic bronchitis, occasional foreign body granulomata with refractile, and respiratory bronchiolitis with marked carbon laden macrophages.
LIVER	Mild to moderate chronic hepatitis.
KIDNEY	Tubular autolysis.
PONS	Multiple acute parenchymal hemorrhages in the base of the pons and tegmentum.

OPINION

1. Darcy Allan SHEPPARD, a 33 year old man, died of blunt impact head trauma. The fatal injury was an impact to the right side of the head that caused fatal damage to the brainstem.

2. The fatal impact also included tangential movement of head against a rough surface such as cement or asphalt due to the extensive abrasion of the right side of the face and marked fragmentation of the right ear. The impact was also associated with a depressed skull fracture which raises the possibility that the impact may have occur over an elevated surface such as the roadside curb.

3. The forces that caused the fatal impact were significant as indicated by the extensive hinge fracture of the skull base.

4. The fatal injury was unsurvivable and would have been inevitably fatal.

5. This man was intoxicated with ethanol at the time of the fatal injury.

6. Incidental findings include chronic hepatitis and occasional foreign body granulomata in the lung. These findings likely relate to prior intravenous drug abuse.

7. Interpretation of the specific causes of the other injuries on the body would require more detailed correlation with the scene and further consideration of circumstantial information. However, there is no indication that this man was 'run-over' by the motor vehicle.

CAUSE OF DEATH

1(a) BLUNT IMPACT HEAD TRAUMA

Dated on October 3, 2009

MICHAEL S. POLLANEN MD PhD FRCPath DMJ (Path) FRCPC