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**Andrew [REDACTED] Rosenberg, M.D.**  
*Professor and Vice Chair*  
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May 15, 2023

[REDACTED] Assistant Solicitor to the Sheku Public Inquiry  
[REDACTED] Assistant Solicitor to the Sheku Public Inquiry

Re: The Sheku Bayoh Public Inquiry

Dear Assistant Solicitors [REDACTED] and [REDACTED]

I am a surgical pathologist subspecialized in bone and soft tissue pathology who has been practicing since 1985. I have had the opportunity to histologically review thousands of bone fractures that have been associated with some form of trauma. Also, I have provided medical evidence and testimony as an expert witness for prosecuting attorneys in the United States in the evaluation and dating of bone fractures in the setting of child abuse murders in 19 cases and have reviewed at least 50 other cases. I have also been an expert witness and have given testimony for the plaintiff and defense in approximately 30 cases of malpractice. I feel that I have the experience and qualifications to provide objective information regarding trauma to the skeletal system. My CV further details my training, experience, research, and international reputation.

I have completed my review and evaluation of the materials provided me regarding the case of Sheku Bayoh. This letter documents my revised conclusions after which I was provided the postmortem CT scan images, and I consider them to be beyond a reasonable doubt. The focus of my review was to assess the pathological changes in the removed left first rib, determine possible causes of the changes, and answer the questions posed to me in the Cause of Death Expert Instruction. The materials provided me are the following:

|   |                   |
|---|-------------------|
| CT ERI Images   | 5/14/2023 4:50 PM |
| Cause of Death Expert Instruction - Appendix A (Summary of events) - shared with witness                                      | 3/29/2023 7:07 AM |
| COPFS-00040 PRO 885 Supplementary PM Report by Dr Shearer & Dr Bouhadair Dated 03.10.17 F542-2016 Bayoh - shared with witness | 3/29/2023 7:08 AM |
| COPFS-02380 Additional Report from Chris Walker dated 23.06.15 - Shared with witness  | 3/29/2023 7:08 AM |
| COPFS-03737 (a) - ATT - Gross of rib DSC00449 - shared with witness   | 3/29/2023 7:08 AM |
| COPFS-05138 2nd Supplementary Report Caffeine - shared with witness (1)   | 3/29/2023 7:07 AM |
| COPFS-05978 (a) - Production 243 - Extract - shared with witness  | 3/29/2023 7:07 AM |
| COPFS-06213 F15 542 AM, Bayoh S, H&E Lvl1, 13.06.17 - 2023-03-06 12.29.26   | 3/29/2023 7:10 AM |
| COPFS-06214 F15 542 AM, Bayoh S, H&E Lvl2, 13.06.17 - 2023-03-06 12.16.02   | 3/29/2023 7:09 AM |
| COPFS-06215 F15 542 AM, Bayoh S, H&E Lvl3, 13.06.17 - 2023-03-06 11.54.28   | 3/29/2023 7:09 AM |
| COPFS-06216 F15 542 AM, Bayoh S, Perls Lvl1, 13.06.17 - 2023-03-06 12.06.30 (1)   | 4/15/2023 3:17 PM |
| COPFS-06216 F15 542 AM, Bayoh S, Perls Lvl1, 13.06.17 - 2023-03-06 12.06.30   | 3/29/2023 7:04 AM |
| COPFS-06217 F15 542 AM, Bayoh S, Perls Lvl2, 13.06.17 - 2023-03-06 11.30.24   | 3/29/2023 7:10 AM |
| COPFS-06218 F15 542 AM, Bayoh S, Perls Lvl3, 13.06.17 - 2023-03-06 11.16.29   | 3/29/2023 7:10 AM |
| Evaluation of findings of Sheku Bayoh   | 4/16/2023 5:02 PM |
| PIRC-01445- FINAL - Autopsy Report REDACTIONS APPLIED - shared with witness   | 3/29/2023 7:07 AM |
| PIRC-04254 - GP Medical Notes - Sheku Bayoh - shared with witness   | 3/29/2023 7:07 AM |
| Professor Andrew Rosenberg - Letter of Instruction - 24 February 2023 - shared with witness                                   | 3/29/2023 7:08 AM |
| PS00100_D449 A370 Compilation of SPA Images Sheku Bayoh Victoria Hosp - shared with witness                                   | 3/29/2023 7:08 AM |
| SBPI-00169 - Digital Reconstruction Skills - FINAL REDACTIONS APPLIED - shared with witness                                   | 3/29/2023 7:07 AM |
| SBPI-00284 Control PAS, 13.06.17 - 2023-03-06 10.59.25  | 4/15/2023 3:07 PM |
| SBPI-00285 F15 542 AM, Bayoh S, MSB, 13.06.17 - 2023-03-06 10.48.52   | 4/15/2023 3:15 PM |
| SBPI-00286 Control MSB, 13.06.17 - 2023-03-06 10.40.55  | 4/15/2023 3:14 PM |
| SBPI-00287 F15 542 AM, Bayoh S, PBR, 13.06.17 - 2023-03-06 10.26.13   | 4/15/2023 3:16 PM |
| SBPI-00288 F15 542 AM, Bayoh S, EVG, 13.06.17 - 2023-03-06 10.15.42   | 4/15/2023 3:14 PM |
| SBPI-00289 F15 542 AM, Bayoh S, Glyco A, 13.06.17 - 2023-03-06 10.04.39   | 4/15/2023 3:16 PM |
| SBPI-00290 Control Glyco A, 13.06.17 - 2023-03-06 10.02.57  | 5/14/2023 5:18 PM |

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All the histological materials were reviewed by me by remote evaluation of whole scanned images of histological slides. The gross photograph of the presumed section of removed ribs at postmortem, and skeletal survey roentgenograms were pdf reproductions. The digital copy of the CD containing the CT was opened with DICOM reader software. The date the decedent was pronounced expired is May 3, 2015, at 9:04 AM. By report the body was subsequently examined at two separate times; one at the time of autopsy on May 4, 2015, and the left first and second ribs and vertebral body of C7 were re-examined several weeks later to correlate findings identified in the postmortem CT scan.

**Histological and Radiological Findings of the First Left Rib:**

The postmortem CT performed on May 28, shows a mildly displaced step off fracture of the left first rib – there is associated gas adjacent to the fracture. There is a small abnormal area fracture involving the left second rib head and the findings are less prominent than in the first rib. There are separate linear saw cuts through C7 bilaterally (right is through vertebral body and posterior elements and left is only through the posterior elements) that are not in the same plane as that present in the first and second ribs and the defects in C7 and left first and second ribs appear different from one another. The tissue is partially autolyzed and this hampers interpretation of the pathological findings. The sampled rib is in three separate pieces on the slides and the orientation that it was sectioned is not provided. However, based on its configuration I presume it to be an axial section along the long axis of the rib and the portion on the slide includes the rib head and attached posterior medial shaft. The pathological findings are a linear break through the anterior and posterior cortices and medullary cavity of the rib shaft that according to the postmortem CT scan is located 1.28 cm lateral to the spine - the fracture is not present in the short piece of bone attached to the rib head. The rib periosteum in the region of the break is also interrupted in a linear fashion and disrupted separate aggregates of hematopoietic elements and small pieces of bone tissue (“bone dust”) are displaced into the neighboring soft tissues at a significant distance from the rib surfaces. There is osteocyte dropout in the bone adjacent to the fracture line and although it is present elsewhere in the specimen, it is most prominent in the fracture site. There is no evidence of hemorrhage or fibrin deposition, and there are no hemosiderin deposits or other types of reaction to the break in the bone and periosteum. There is no morphological evidence of a metabolic bone disease or sickle cell disease. I do not have experience in interpreting the glycophorin A immunohistochemical slide in decomposed tissue so I do not provide an interpretation of them.

**Correlative Findings:**

No fractures are identified in the skeletal survey. At the initial autopsy on May 4, 2015, according to the report, no rib fractures or hemorrhage associated with the anterior or posterior surfaces of the left first and second ribs are noted, and the pleural fluid is described as straw colored (normal) and not tinged with blood. It is unclear what date the rib tissue was removed from the body, and during re-examination of the body several weeks after death when the ribs were removed a “possible soft tissue hemorrhage measuring 0.5 cm in diameter” was found beneath removed soft tissue overlying the left first rib and the underlying rib was broken and no injury to the second rib was identified. The gross photograph of the presumed anterior surface of the removed left first and second ribs shows disrupted fat and no obvious hemorrhage or break in the sampled bones. There is no photograph of the thoracic cavities after the lungs have been removed at the time of autopsy to further determine the presence or absence of hemorrhage or injury. Also, there are no injuries to the skin or soft tissue overlying the posterior left first and second ribs described in the external examination or in the photographs of the body. Regardless, the postmortem CT scan shows an irregular linear fracture through the posterior medial first and second ribs confirmed by the histological examination of the first rib with no evidence of hemorrhage or healing.

**Answers to Inquires Posed by Assistant Solicitor [REDACTED] :**

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- 1) Mechanism and Timing of Rib Fracture: Based on the autopsy and histological findings I feel that the left first rib fracture is antemortem and is less than 24 hours of age. Based on the records it may have been caused by the fall when first being subdued the police officers. Infrequently first rib fractures have been described when falling on an outstretched upper extremity. This would explain the lack of skin, soft tissue, and peri-rib hemorrhage noted at the initial autopsy. The lack of hemorrhage and fibrin deposition at the break histologically, is likely the result of post mortem autolysis.
- 2) Role of Manual CPR: CPR did not cause the fracture. The vast majority of fractures related to vigorous CPR are located in the anterior portions of the ribs, not posterior, and the first rib is rarely affected. Also, CPR associated fractures are typically multiple and bilateral. Notably, no anterior rib fractures were noted at autopsy or in the radiological studies.
- 3) Significance of Sickle Cell Trait: None in relationship to the pathological changes in the rib or the cause of death.

If there are any questions concerning my evaluation, please contact me.

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