

**UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA**

IN RE: NATIONAL HOCKEY LEAGUE)
PLAYERS' CONCUSSION INJURY)
LITIGATION)
) MDL No. 14-2551 (SRN/JSM)
This Document Relates to: ALL ACTIONS)
)
_____)

**DECLARATION OF RUDY CASTELLANI, MD IN SUPPORT OF DEFENDANT
NATIONAL HOCKEY LEAGUE'S MOTION TO COMPEL PRODUCTION OF
DOCUMENTS FROM THE BOSTON UNIVERSITY CTE CENTER**

I, RUDY CASTELLANI, MD, declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the following is true and correct:

1. I submit this declaration in support of the NHL's Motion to Compel Production of Documents From the Boston University CTE Center ("BU CTE Center" or the "Center"). I have information relevant to this motion, and I have personal knowledge of each statement made in this declaration.

Professional Background

2. I am a neuropathologist at and Director of the Western Michigan University Center for Neuropathology. I am clinical neuropathologist who provides neuropathologic diagnoses at autopsy for several hundred cases every year, including forensic pathology cases, dementia cases, pediatric head trauma cases, and hospital-based cases that span a large spectrum of neurologic diseases. I also study the pathology and pathogenesis of neurodegenerative disease and neurotrauma, both acute pathology and long term

sequelae. I have examined the brains of collegiate and professional football players and boxers.

3. I obtained a Bachelor of Science in Physiology from Michigan State University in 1986. I received my medical degree from Wayne State University in 1990, after which I trained in anatomic pathology at Wayne State University's Detroit Medical Center, followed by a neuropathology fellowship at Case Western Reserve University and University Hospitals of Cleveland, under the mentorship of Drs. Pierluigi Gambetti, MD, Mark Cohen, MD, and Uros Roessmann, MD.

4. I am licensed by the American Board of Pathology in Anatomic Pathology and Neuropathology.

5. I have held faculty positions at Case Western Reserve University, Michigan State University, and the University of Maryland School of Medicine. Since March 2016, I have been on the faculty at Western Michigan University, where I am currently a professor of pathology, Director of the Center of Neuropathology, and Director of the Research Histology laboratory. I am also have a part time role as a clinical professor of pathology at the University of Maryland School of Medicine, where I examine autopsy specimens as well as biopsies of brain, spinal cord, nerve, muscle, and eye from living patients.

Relevance of Materials Sought in Subpoena to the BU CTE Center

6. I understand that the BU CTE Center has objected to the NHL's requests for pathology photographs and copies of slides for athletes examined by the Center in connection with research related to Chronic Traumatic Encephalopathy ("CTE").

7. The typical autopsy neuropathological examination includes review of available clinical data and brain removal. Dura mater and the pituitary gland are often included in the examination. Spinal cord examination may also be included, particularly if the brain examination is accompanied by a complete autopsy. The prefixation brain weight is usually obtained. At research centers, the brain is often divided midsagittally, with one half or otherwise some portions immediately frozen, and the other half or other portions placed in fixative, typically neutral buffered formalin.

8. The following regions may be sampled for histological examination, although sampling protocols vary according to research interests or as deemed necessary by the neuropathologist for case evaluation: Superior and middle frontal gyrus, orbital cortex, Brodmann areas 4, 3, 1, 2 in the ACA/MCA arterial border zone (watershed territories, basal ganglia with basal forebrain, amygdala, hippocampus (rostral and caudal levels with adjacent amygdala, parahippocampal gyrus, and inferior temporal cortex), superior temporal gyrus, parietal cortex (angular gyrus), calcarine cortex, hypothalamus with mammillary bodies, thalamus, midbrain, pons, medulla, cerebellar vermis, and lateral cerebellar hemisphere).

9. Sections of the brain then may be stained using any or all, but not limited to, the following methods/stains: hematoxylin and eosin, modified Bielschowsky, modified thioflavin S, anti-amyloid, anti-abnormally phosphorylated tau, anti-TDP-43, anti-ubiquitin, and -synuclein.

10. Accordingly, as part of the neuropathological evaluation of any brain for dementia or other conditions, numerous slides are created. Slides may be digitized for

virtual microscopy. Numerous photographs may also be created. Using copies of these images and slides, a neuropathologist can independently assess the gross and microscopic findings, along with the clinical history, and provide an independent neuropathological diagnosis and interpretation according to scientific principles and the evidence base.

11. For example, I analyzed the index case of CTE in a football player, which is described in a 2005 paper published by Dr. Bennet Omalu. *See* Omalu, Bennet I. et al., “Chronic traumatic encephalopathy in a National Football League player.” *Neurosurgery* 57.1 (2005): 128-134. As part of my review, I examined the clinical data provided in the narrative, and the limited set of pathological images included in the paper. From even this cursory review, it was unambiguous that the limited amount and cellular localization of phosphorylated tau would not remotely qualify for any neurodegenerative process, and was well within the range of normal for a 50 year old man. As such, there was no evidence whatsoever that the decedent described in this paper had a progressive neurodegenerative condition, and I disagree that the material provided by Omalu et al. in that paper permits the diagnosis of any neurodegenerative disease, including so-called “CTE.” Not indicated in this paper, and in papers in general, is the extent of sampling, the number of immunostains performed, and whether the pathology depicted was representative of data overall, notwithstanding the scant pathology.

12. I also have reviewed other publicly available materials related to case series purporting to identify CTE pathology in the brains of deceased athletes, including papers published by researchers at the BU CTE Center. These publications often include pathology photomicrographs of various immunohistochemical preparations, and whole

mount photographs of phospho-tau immunostains prepared via freezing-sliding microtomy and free-floating thick (~50 micron) immunohistochemistry. Like the Omalu et al. publication, however, these publications only depict microscopic pathology deemed “representative” or most illustrative in support of the case and the hypothesis, and provide no data in terms of scale, extent of sampling, numbers of brain regions examined via immunohistochemistry, extent of immunostaining via freezing-sliding microtomy, or variability, if any, in extent of these studies performed within and between athletes, athlete controls, non-athlete controls, and/or other disease controls. This precludes independent assessment. These papers also fail to fully describe the methodology employed by researchers at the Center.

13. If I had access to copies of gross pathology photographs, all brain slides, and clinical data, I could verify the accuracy of the reports, evaluate for other pathological processes that may be significant, and conduct a full, independent neuropathological analysis of the cases reported by researchers at the BU CTE Center.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on January 19, 2017 in Kalamazoo, Michigan.

Respectfully submitted,

A handwritten signature in cursive script, reading "Rudy Castellani M.D.", is written above a horizontal line.

Rudy Castellani, M.D.

Yolanda Sherman

From: ecf-notice@mnd.uscourts.gov
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U.S. District Court

U.S. District of Minnesota

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Case Name: IN RE: National Hockey League Players' Concussion Injury Litigation
Case Number: [0:14-md-02551-SRN-JSM](#)
Filer: National Hockey League
Document Number: [671](#)

Docket Text:

Declaration of Rudy Castellani, MD in Support of [666] MOTION to Compel Production of Documents from the Boston University CTE Center filed by National Hockey League. (Connolly, Daniel)

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