



**DOWNSTATE**  
HEALTH SCIENCES UNIVERSITY

# Decolonizing Neurosurgery in Black Communities: *A Brooklyn Haitian-American Perspective*

**Wednesday, February 22, 2023**

**Ernest J. Barthélemy, MD, MPH, MA**

**Chief, Division of Neurosurgery**

**Assistant Professor of Surgery, Neurology, Orthopedic  
Surgery and Public Health**

***SUNY Downstate Health Sciences University***



# No Disclosures

# Son of Haitian Immigrants

CERTIFICATE OF BIRTH

156-80-326622

Birth No.

First Name: Ernest Middle Name: Joseph Last Name: Barthelemy

1. NUMBER OF CHILDREN born in this pregnancy more than one, or of this child or of birth: 1

4a. DATE OF CHILD'S BIRTH: September 9, [redacted] 7:42AM

b. NAME OF HOSPITAL, if not in hospital, street address: The Brookdale Hospital Medical Center

c. TYPE OF PLACE:  Hospital  Home  Other

6b. MOTHER'S AGE at time of this birth: [redacted]

6c. MOTHER'S BIRTHPLACE, State or foreign country: Haiti

c. City, town or location: Brooklyn

d. Street and house number: 1633 Brooklyn Avenue

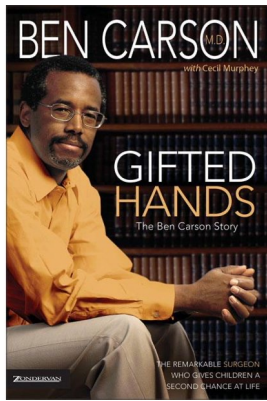
e. Inside city limits of 7c? Yes  No

8b. FATHER'S AGE at time of this birth: [redacted]

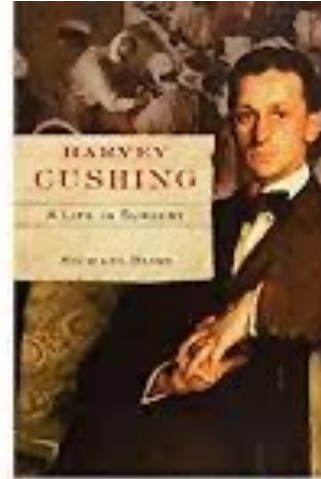
8c. FATHER'S BIRTHPLACE, State or foreign country: Haiti

LIVE





~2005-2007  
Medicine? Biomedical Research?  
**Neurosurgery???**



**NO MAN  
ALONE**  
*A Neurosurgeon's Life*

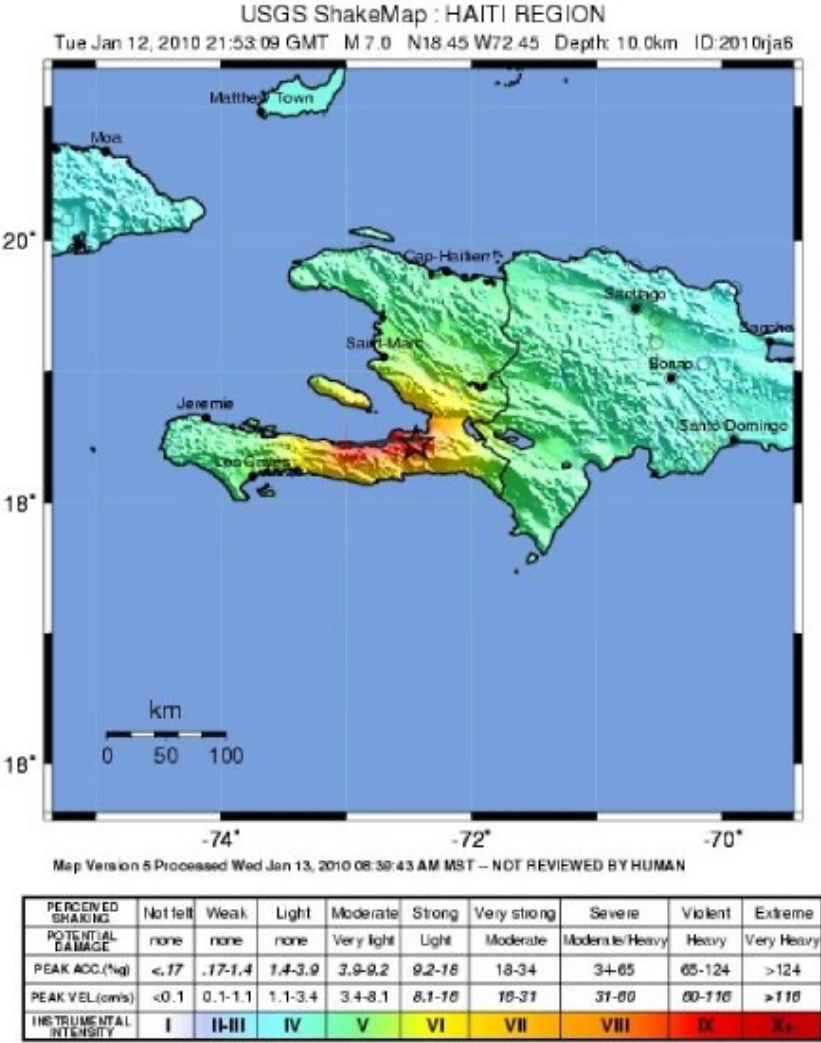


**WILDER  
PENFIELD**



# Global Health...

January 12, 2010



# Global Health... and Neurosurgery

*Service in Haiti:*  
2010



*Research in Haiti :*  
2012-2013

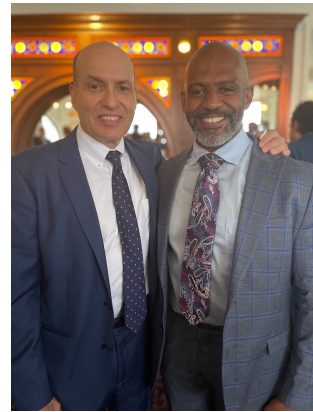


*Medical School:*  
2008-2014



# ...Neurosurgery Residency...

2014-2021



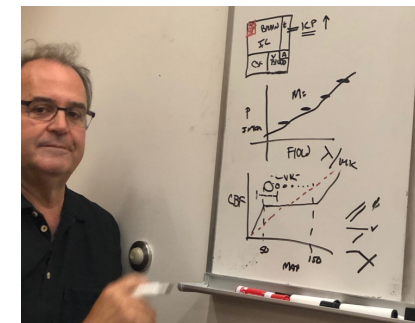
# ...Global Surgery Fellowships...

2017-2019; 2021-2022

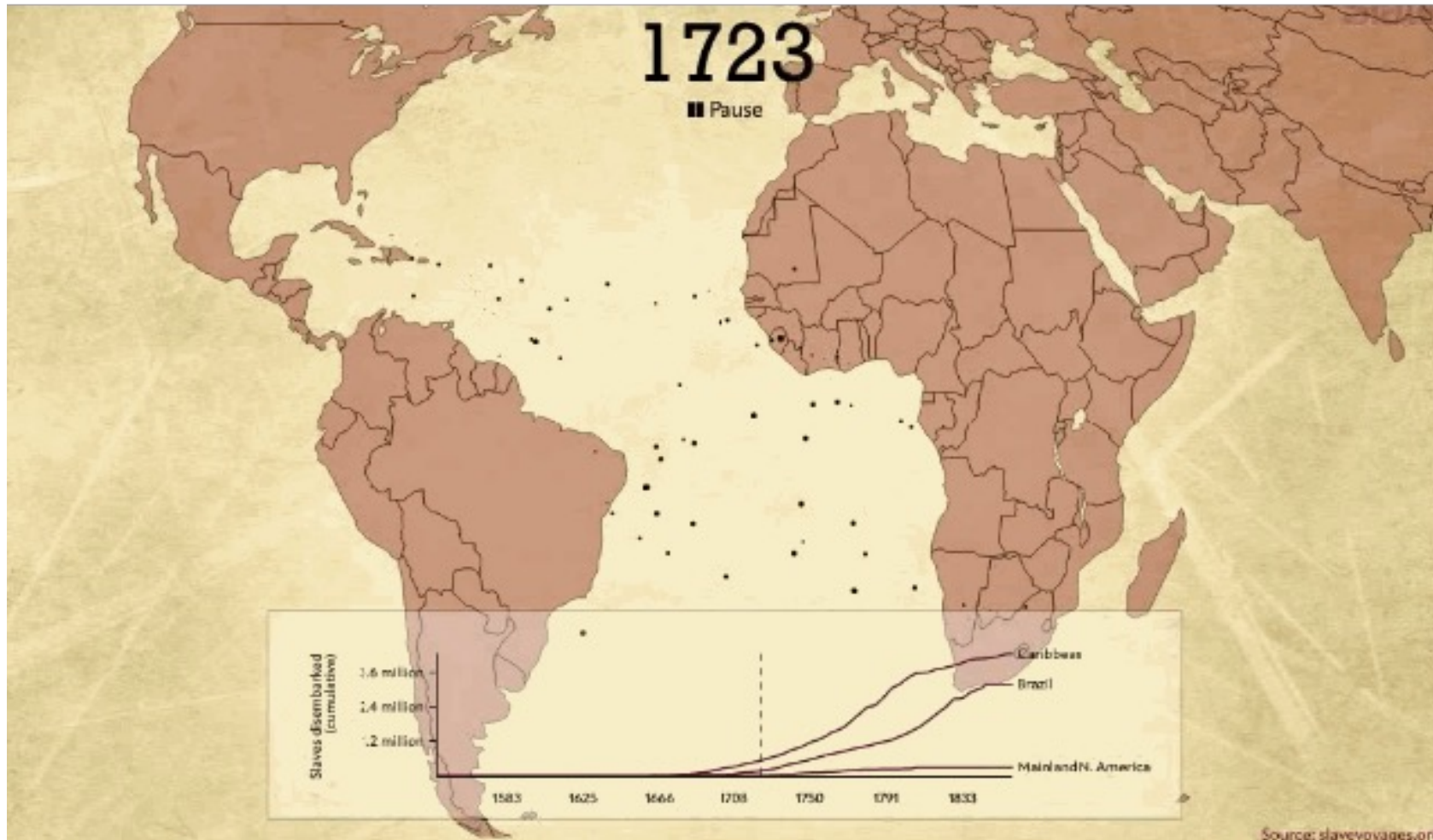


# Neurotrauma Fellowship

2021-2022



<https://www.SlaveVoyages.org/>

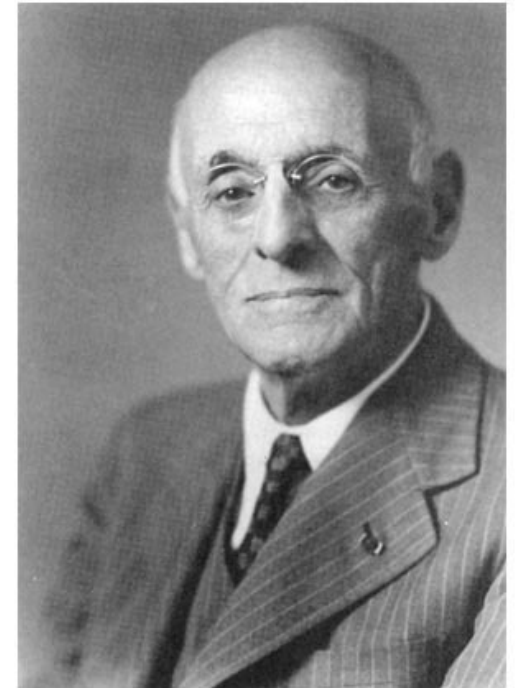




# The Flexner Report

- 1910 Report – Addressed to public
  - Changed face of Medicine
  - Scientific Focus
  - Comprehensive Nature
  - Criticized Mediocrity; Profit Motive
  - Praise for University-based medical education of Germany
  - **Fueled a popular and political movement that convinced state legislatures across the country to undertake thorough reforms of medical education and licensure along the lines of Flexner's model.**

**Abraham Flexner**  
**1866-1959**



MEDICAL EDUCATION  
IN THE  
UNITED STATES AND CANADA

A REPORT TO  
THE CARNEGIE FOUNDATION  
FOR THE ADVANCEMENT OF TEACHING

BY  
ABRAHAM FLEXNER

WITH AN INTRODUCTION BY  
HENRY S. PRITCHETT  
PRESIDENT OF THE FOUNDATION

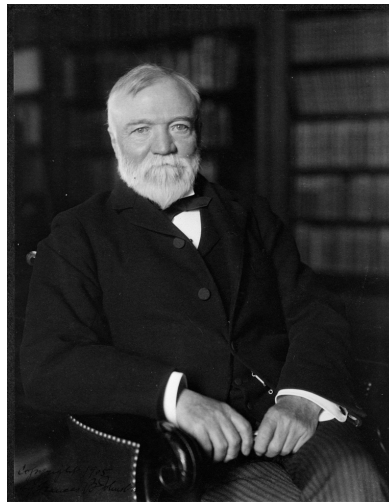
# The Flexner Report

“The negro must be educated not only for his sake, but for ours. He is, as far as human eye can see, a permanent factor in the nation. He has his rights and due and value as an individual; but he has, besides, the tremendous importance that **belongs to a potential source of infection and contagion.**”

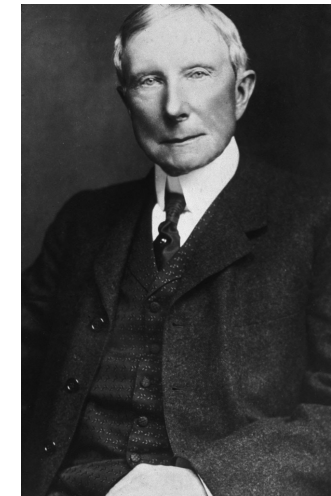
“The negro needs Good schools rather than many schools, -- schools to which the more promising of the race can be sent to receive a **substantial education in which hygiene rather than surgery, for example, is strongly accentuated.**”

# The Flexner Report: Structural Power

- **Commissioned (Financed) by the Carnegie Foundation**
  - Published in “Bulletin Number Four” of the Carnegie Foundation for the Advancement of Teaching
- **Reinforced by Rockefeller**
  - General Education Board - \$180M
- **Supported and Advanced by the AMA**
  - Embraced Recommendations
  - Annual evaluations of medical education reform (JAMA)
  - 40% of US medical schools closed (including 5/7 African American Medical Colleges)



MEDICAL EDUCATION  
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# Harvey Cushing, MD

## 1869 - 1939

Opposition to hiring black nurses in municipal hospitals:

- **“I am sure that colored women would often make excellent trained nurses... But this will mean that colored men who are their friends... will have to appear at the nurses’ parties and receptions and this would be absolutely disastrous to the whole social status of your training school.”**
  - Message to Cleveland’s Director of Public Health

Message to his father about a gorilla in the laboratory of Charles Sherrington:

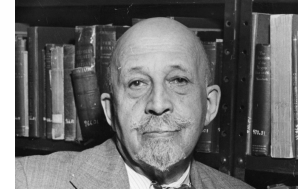
- **“...Coal-black — I don’t believe you could have distinguished his ear from a darkies [sic]. He smelled just like a dirty Negro — behaved like one.”**

Bliss, M. (2007). *Harvey Cushing: a life in surgery*. Oxford University Press.



# African American Historical Context

- 1896: Separate but Equal (Plessy v. Ferguson) is constitutional (segregation is legalized).
- 1903: **February 1:** [W.E.B. Du Bois](#) publishes "The Souls of Black Folks."
  - Collection of essays
  - Explores racial equality
  - Seminal work in the history of sociology; cornerstone of Black literature
  - One of the greatest works of nonfiction, of any type, in the English language



*"Herein lie buried many things which if read with patience may show the strange meaning of being Black here at the dawning of the Twentieth Century. This meaning is not without interest to you, Gentle Reader; for **the problem of the Twentieth Century is the problem of the color line**. I pray you, then, receive my little book in all charity, studying my words with me, forgiving mistake and foible for sake of the faith and passion that is in me, and seeking the grain of truth hidden there."*

- **1908 (August 14): The Springfield Race Riot begins in Springfield, Illinois. It is considered the first of its kind in a Northern city in more than 50 years.**
- **1909 (February 12):** In response to the Springfield Riot and a number of other incidents, the [NAACP](#) is founded to end inequality.
- 1912: More than 60 Black Americans are lynched this year, part of a larger violent trend in the U.S., as there are nearly **5,000 lynchings throughout the country between 1882 and 1968, mainly of Black men.**



# Plessy vs. Ferguson Reversed: *Brown vs. Board of Education of Topeka* 1954

Landmark decision of US Supreme Court

Ruled that **US state laws establishing racial segregation in public schools are unconstitutional, even if the segregated schools are otherwise equal in quality.**

**Partially overruled Plessy vs. Ferguson**, declaring that the "separate but equal" notion was unconstitutional for American public schools and educational facilities.

Paved the way for integration.

Major Civil rights movement victory.

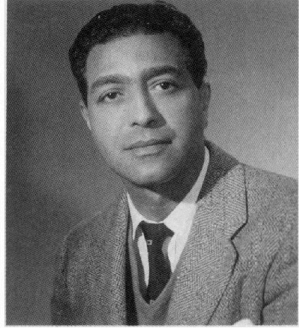


Rev. Oliver Brown

# **African American Representation in Neurosurgery**

Clarence S. Greene Sr., MD,  
FACS  
1901-1957

Figure 1. Clarence S. Greene Sr., MD, FACS, the first African-American neurosurgeon



Courtesy of the American Board of Neurological Surgery

E. Latunde Odeku, MD, FACS  
1927-1974

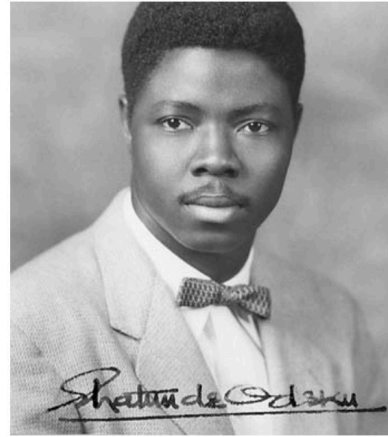


FIGURE 1. Photograph of E. Latunde Odeku, M.D., F.A.C.S., the first African-American neurosurgeon trained in the United States and the Father of Neurosurgery in Black Africa. Courtesy of the American Board of Neurological Surgery.

Alexa Irene Canady., MD  
b. 1950



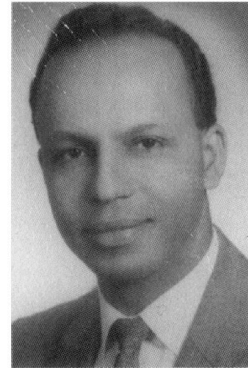
Jesse B. Barber Jr., MD, FACS  
1924-2002

Figure 4. Jesse B. Barber Jr., MD, FACS



Courtesy of the American Board of Neurological Surgery.

Figure 5. Lloyd A. Dayes, MD, PhD, FACS



Courtesy of the American Board of Neurological Surgery

M. Deborah Hyde., MD, MS, FACS  
b. 1949



Lloyd Dayes., MD, PhD, FICS, FACS  
(Dmin, DNB, LMCC, FICA, FRSM, FOANS, DTh,  
DRE, DrST, DD, CMI FACFE, DABFM, MBA  
DABFE, DRS, FRCS, FRCP)  
1929-2022



# Global Neurosurgery in Brooklyn: Demographics

- **Population: 2.74 million people in 70 neighborhoods – most populous and fastest growing borough**
- **2<sup>nd</sup> largest Black Population of any North American City (730K; larger than Atlanta and Detroit Combined)**
- **Over 1/3 of Residents born in Another Country**
- **Speakers of >200 Languages (~50% Households Speak a Language other than English)**
- **1/5 Residents living in Poverty**
- **Most Children in NYC living in Poverty**
- **Most Public Housing Units in New York City (Brownsville: Highest Concentration in the Nation)**



# Global Neurosurgery in Brooklyn: Epidemiology

Leading Causes of All Deaths for Total Population  
Selected Counties: Kings

Top 5 Causes

		Number of deaths and age-adjusted death rate					
		Total Deaths	#1 Cause of Death	#2 Cause of Death	#3 Cause of Death	#4 Cause of Death	#5 Cause of Death
Kings	2019	Total Deaths 15,990 560.0 per 100,000	Heart Disease 5,717 196.6 per 100,000	Cancer 3,357 119.3 per 100,000	Unintentional Injury 640 23.3 per 100,000	Diabetes 628 22.3 per 100,000	Cerebrovascular Disease 544 19.0 per 100,000
	2018	Total Deaths 16,139 565.4 per 100,000	Heart Disease 5,688 195.8 per 100,000	Cancer 3,569 126.5 per 100,000	Diabetes 682 24.3 per 100,000	Pneumonia and Influenza 657 22.6 per 100,000	Unintentional Injury 587 21.7 per 100,000
	2017	Total Deaths 16,206 574.5 per 100,000	Heart Disease 5,437 189.4 per 100,000	Cancer 3,848 138.7 per 100,000	Diabetes 673 23.9 per 100,000	Unintentional Injury 662 24.4 per 100,000	Pneumonia and Influenza 662 23.2 per 100,000
	2016	Total Deaths 15,978 574.6 per 100,000	Heart Disease 5,384 191.5 per 100,000	Cancer 3,677 133.5 per 100,000	Pneumonia and Influenza 649 22.9 per 100,000	Unintentional Injury 624 22.8 per 100,000	Diabetes 607 22.5 per 100,000
	2015	Total Deaths 15,903 579.9 per 100,000	Heart Disease 5,349 193.3 per 100,000	Cancer 3,699 136.8 per 100,000	Pneumonia and Influenza 697 25.1 per 100,000	Diabetes 615 22.8 per 100,000	Unintentional Injury 579 21.6 per 100,000

# Global Neurosurgery in Brooklyn:

## Burden of Disease

- Stroke
- Brain Trauma
- Spine Trauma
- Brain Tumors
- Spine Tumors
- Neurodegenerative Diseases
- Spinal Disorders

–

## Care Capacity

- Neuroendosvascular/Thrombectomy
- Neurocritical Care
- Trauma Center Diagnostics
- Precision Care/Centers of Excellence
- Radiation/Adjuvant Therapies
- Functional Neurosurgery Access
- Comprehensive Spine Care

–

## Determinants

- Race – History
- Policy – Structure
- SES – Insurance Status
- Immigration Status
- Language
- Education – Health Literacy
- Zip Code
- Diet
- Primary Care



# Challenges of Caring for the Underserved

Subspecialty	Lead author <sup>a</sup>	Summary of findings (compared with White patients, Black patients have...)
<b>Stroke</b>		
<b>Access</b>	Otite <sup>e1</sup>	Less access to acute treatments such as thrombolysis and thrombectomy
	Levine <sup>e2</sup>	Poorer poststroke access to medications and physician care
<b>Outcomes</b>	Esenwa <sup>e3</sup>	Higher rates of stroke
	Elkind <sup>e4</sup>	Higher stroke mortality
<b>Parkinson disease</b>		
<b>Access</b>	Chan <sup>e9</sup>	Less access to deep brain stimulation
<b>Outcomes</b>	Xie <sup>e10</sup>	Increased mortality and less likely to receive treatment
	Hemming <sup>e11</sup>	Delays in diagnosis and greater disease severity
<b>Epilepsy</b>		
<b>Access</b>	Begley <sup>e5</sup>	Poorer access to epileptologists
	Thompson <sup>e6</sup>	Poorer access to surgical treatment
<b>Outcomes</b>	Bautista <sup>e7</sup>	Lower rates of antiseizure medication adherence
	Wilson <sup>e8</sup>	Increased mortality from epilepsy

**Robbins et al, 2022**

# Challenges and Opportunities for Diversity in Neurosurgery

# Diversity in Neurosurgery- Trends in Gender and Racial/Ethnic Representation Among Applicants and Residents from U.S. Neurological Surgery Residency Programs

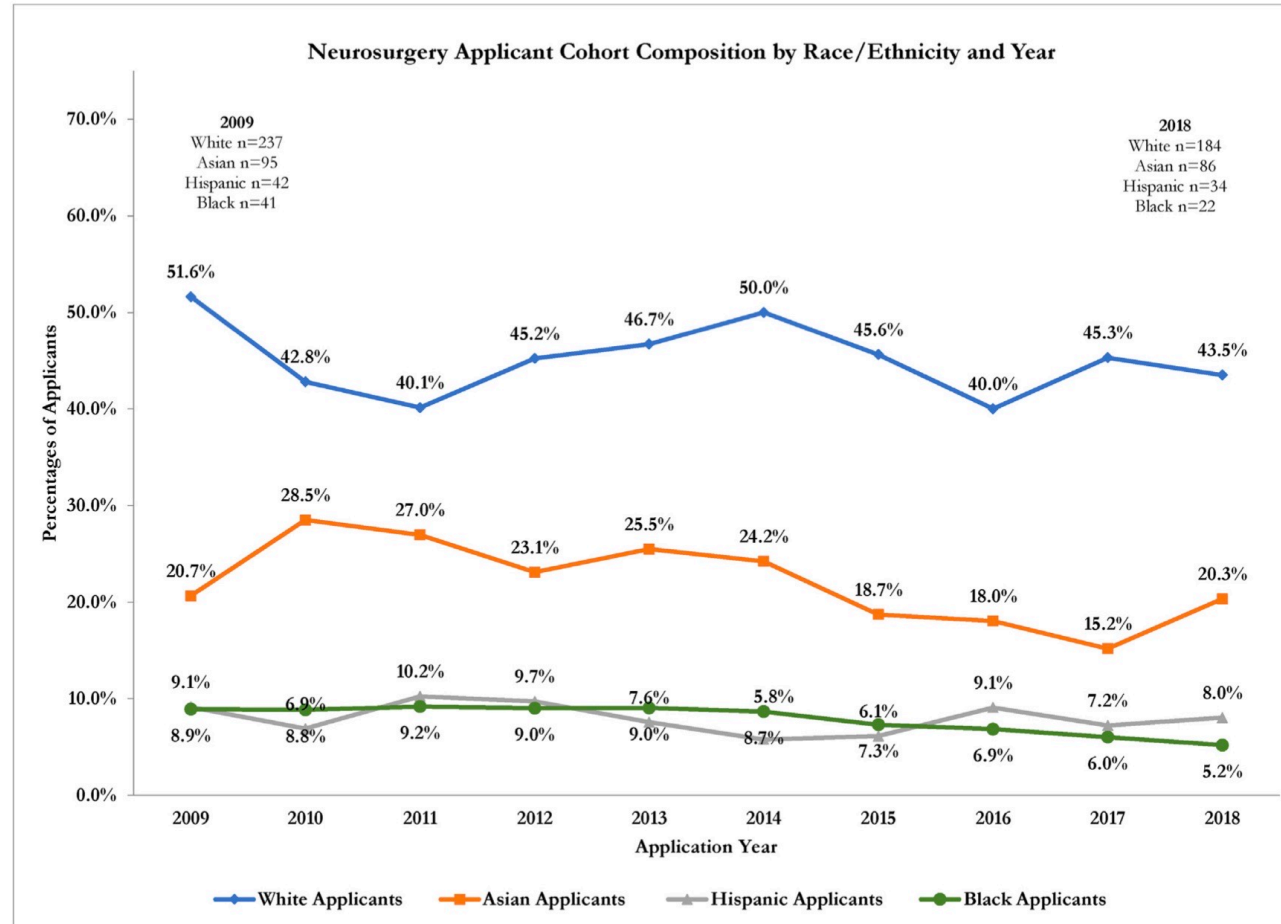


Figure 2. Racial/ethnic distribution and composition of neurosurgery applicant cohorts from 2009 to 2018.

Gabriel et al 2021

# OPPORTUNITIES

- Pathway/Pipeline Programs
  - E.g. DR MMEN (McNeill et al., 2022)
- Diversity Initiatives (AANS, CNS)



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[Join Us](#)

“...enriching the equity and integrity of  
neurosurgical care”



POINTS OF VIEW

## The Death of Daniel Prude — Reflections of a Black Neurosurgeon

The email message's first words — “Daniel Prude. Say his Name.” — seemed to tell me all I needed to know. Then, my heart racing, I learned that Prude was murdered in my city, where he'd been admitted to my hospital and seen by my colleagues the day before he died.

His death hit me hard: another Black victim of police brutality, he was also a patient harmed

address both disparities in mental health care and police brutality, we are all responsible for my cousin's death. These incidents are not caused by a “few bad apples”: the problem is baked into every facet of our society. When 13% of our population but only 2% of psychiatrists and 3% of health service psychologists identify as Black or African American, there is a bigger problem.<sup>1</sup>



Paul DA. N Engl J Med. 2020 Dec 10;383(24):e135



# Advocacy



**“As a society, we can elect leaders committed to dismantling systemic factors that...”**

*Normalize the abnormal...justify the unjust*

**“We can advocate for more resources...”**

**“We can hold health care systems... accountable...”**

**“As a Black community, we can encourage our children to pursue careers in...”**

**(medicine... surgery... neurosurgery...)**

**“Medical and graduate schools can promote a more diverse workforce and build bridges with the community.”**

**“When we march in the streets, we should also march in the halls of the academy...”**


Paul DA. N Engl J Med. 2020 Dec 10;383(24):e135



OPEN ACCESS

REVIEW

## Historical determinants of neurosurgical inequities in Africa and the African diaspora: A review and analysis of coloniality

Ernest J. Barthélemy , Sylviane A. Diouf, Ana Cristina Veiga Silva, Nancy Abu-Bonsrah, Isabella Assunção Santos de Souza, Ulrick Sidney Kanmounye, Phabinly Gabriel, Kwadwo Sarpong, Edjah K. Nduom, Jean Wilguens Lartigue, Ignatius Esene, Claire Karekezi

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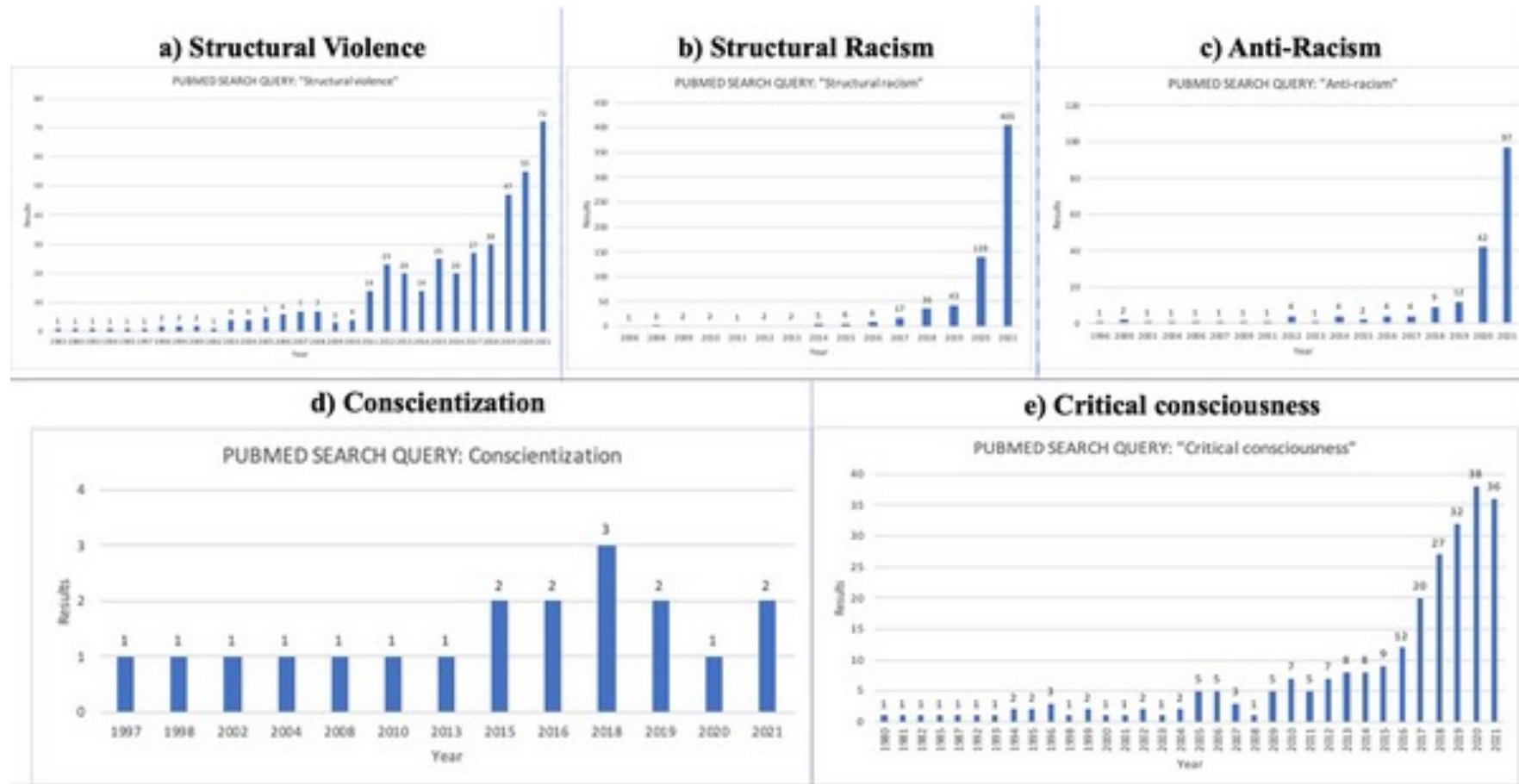
**Table 1. Comparison of current neurosurgical workforce.**

Former Colonial Power/Current HIC					Former Colony/Current LMIC				
Nation	Pop (x1M)	#NS	NWD	YTS	Nation	Pop (x1M)	#NS	NWD	YTS
France	66-496	443	0-666	1938 [14]	Haiti	11-198 [15]	3	0-028	2016 [16]
United Kingdom	67-081 [18]	389 [19]	0-580	1933 [20]	Cameroon	24 [17]	26 [17]	0-108	2010 [17]
					Ghana	30-1 [17]	24 [17]	0-080	1989 [21]
Belgium	11-231	158	1-406	1948 [22]	Rwanda	12-956 [23]	6	0-046	2012 [24]
Germany	80-983	1285	1-586	1934 [25]					
Portugal	10-401	168	1-615	1955 [26]	Cape Verde	0-514	2	0-389	N/A
					Brazil	212-559 [27]	3682 [28]	1-73	1970 [29]

Comparison of current neurosurgical workforce: Former colonial power vs. former colony. Former colonial metropolises which are currently High-Income Countries (HIC) are matched to their former colonies which are currently low- and middle-income countries (LMIC). Where an HIC historically colonized more than one nation, its row intersects with both former colonies, e.g., France and Portugal. Where LMIC has been colonized by more than one HIC, it has been positioned so that its row appears at the intersection of its corresponding former metropolises, e.g., Cameroon and Rwanda. Legend: Pop (x1M) = Population in millions. #NS = quantity of neurosurgeons. NWD = Neurosurgeon Workforce Density per 100,000-population. YTS = Year neurosurgery training began. Data is from the 2016 WFNS Neurosurgery Workforce map except where indicated.

<https://doi.org/10.1371/journal.pgph.0001550.t001>

Fig 1.



**Table 3. A decolonial lexicon for global neurosurgery.**

Term	Definition/Description
<b>Structural Violence</b>	Structural violence refers to harm that comes to people who, by virtue of social structures, governments, economies, religions, laws or policies, face significant barriers to having their basic needs met. Examples of these barriers include institutional or structural racism, elitism, ethnocentrism or nationalism [93]. It is therefore distinguished from other forms of violence by (1) the relative invisibility of its source and (2) the absence of one or more identifiable aggressor(s).
<b>Structural Racism</b>	Structural racism refers to legislation, policies and societal norms that are based on facilitating economic advantage and prosperity for members of a favoured race, such as people of “fair” or “lighter” skin colour who appear to descend from Western Europe, while codifying barriers to prosperity and access for people of darker skin colour who appear to descend from Sub-Saharan Africa [11, 94].
<b>Anti-Racism</b>	As the term implies, anti-racism refers to approaches that expose discriminatory perspectives, policies, practices and behaviours that are based on racial differences. Anti-racist approaches advance health equity by prioritizing solutions that favour groups of people who suffer most because of their racial background or identity [34].
<b>Conscientization and Critical Consciousness</b>	The related terms “conscientization” and “critical consciousness” are concepts from the field of adult education advanced by the late Brazilian philosopher and educator, Paulo Freire, in <i>Pedagogy of the Oppressed</i> , and related work on transformative education. Critical consciousness refers to a reflective awareness of the differential power dynamics and privileges that underlie societal inequities [95] The development of this form of awareness is a process that Freire calls, “conscientization,” and is distinguished as an approach to education that liberates participants in the educational process rather than perpetuating the “oppressor/oppressed” dichotomy in traditional forms of education [30].

A Decolonial Lexicon for Global Neurosurgery. Terms were selected by the authors based on their recurrence in relevant literature as emerging themes in the decolonization movement [9, 11, 30–38].

<https://doi.org/10.1371/journal.pgph.0001550.t003>

**Table 4. A guide for reflection, dialogue and project analysis to decolonize global neurosurgery.**

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**In scientific endeavours:**

- Will authorship order and work distribution empower the team members who represent the marginalized population?
- Is the research question primarily shaped by local priorities?
- What impact will publications have on the local culture and society versus the careers and home institutions of HIC stakeholders?
- Does the publication plan accommodate the local language and accessibility requirements that maximize the usefulness of the publication to LMIC partners and stakeholders?
- Are there disparities in research capacity that would be addressed with initiatives that prioritize the advancement of scientific equity?
- Do local IRBs exist? Have local IRBs reviewed the ethical soundness of the research plan?

---

**In clinical educational initiatives:**

- What neo-colonial dynamics are introduced into new international educational relationships and partnerships?
- Have local leaders in existing clinical education initiatives been identified and engaged in educational processes?
- Have local needs and preferences been comprehensively solicited, fully understood, and authentically prioritized in the development of educational programs?
- What is/are the language(s) of instruction and how are they being used?
- How are institutional partnerships being generated, and what pathways for bidirectional education have been explored?
- Examine underlying assumptions of the power dynamics in international education partnerships (teacher/student, attending/resident, mentor/mentee): Are HIC practitioners or experts explicitly, or implicitly assumed to be “superior” to LMIC practitioners or experts?
- What steps can be taken to dismantle neo-colonial power structures of the project or initiative?

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A practical guide for GN partnerships to support reflection, dialogue and project analysis that prioritizes decolonial humanism in GN and GH.

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<https://doi.org/10.1371/journal.pgph.0001550.t004>

# Bibliography

- Harley EH. The forgotten history of defunct black medical schools in the 19th and 20th centuries and the impact of the Flexner Report. *J Natl Med Assoc.* 2006 Sep;98(9):1425-9. PMID: 17019907; PMCID: PMC2569729.
- Campbell KM, Corral I, Infante Linares JL, Tumin D. Projected Estimates of African American Medical Graduates of Closed Historically Black Medical Schools. *JAMA Netw Open.* 2020 Aug 3;3(8):e2015220. doi: 10.1001/jamanetworkopen.2020.15220. PMID: 32816033; PMCID: PMC7441360.
- Steinecke A, Terrell C. Progress for whose future? The impact of the Flexner Report on medical education for racial and ethnic minority physicians in the United States. *Acad Med.* 2010 Feb;85(2):236-45. doi: 10.1097/ACM.0b013e3181c885be. PMID: 20107348.
- Baker RB, Washington HA, Olakanmi O, Savitt TL, Jacobs EA, Hoover E, Wynia MK; Writing Group on the History of African Americans and the Medical Profession; Blanchard J, Boulware LE, Braddock C, Corbie-Smith G, Crawley L, LaVeist TA, Maxey R, Mills C, Moseley KL, Williams DR. Creating a segregated medical profession: African American physicians and organized medicine, 1846-1910. *J Natl Med Assoc.* 2009 Jun;101(6):501-12. doi: 10.1016/s0027-9684(15)30935-4. PMID: 19585918.
- Duffy TP. The Flexner Report--100 years later. *Yale J Biol Med.* 2011 Sep;84(3):269-76. PMID: 21966046; PMCID: PMC3178858.
- Cooke M, Irby DM, Sullivan W, Ludmerer KM. American medical education 100 years after the Flexner report. *N Engl J Med.* 2006 Sep 28;355(13):1339-44. doi: 10.1056/NEJMra055445. PMID: 17005951.
- Flexner, Abraham (1910), *Medical Education in the United States and Canada: A Report to the Carnegie Foundation for the Advancement of Teaching (PDF)*, Bulletin No. 4., New York City: Carnegie Foundation for the Advancement of Teaching, p. 346, OCLC 9795002, retrieved August 22, 2021
- Paul DA. The Death of Daniel Prude - Reflections of a Black Neurosurgeon. *N Engl J Med.* 2020 Dec 10;383(24):e135. doi: 10.1056/NEJMp2030234. Epub 2020 Nov 18. PMID: 33207088.
- Gabriel PJ, Alexander J, Kärkliņa A. Diversity in Neurosurgery: Trends in Gender and Racial/Ethnic Representation Among Applicants and Residents from U.S. Neurological Surgery Residency Programs. *World Neurosurg.* 2021 Jun;150:e305-e315. doi: 10.1016/j.wneu.2021.02.127. Epub 2021 Mar 5. PMID: 33684577.
- Bryant JP, Nwokoye DI, Cox MF, Mbabuike NS. The progression of diversity: Black women in neurosurgery. *Neurosurg Focus.* 2021 Mar;50(3):E9. doi:
- McClelland S 3rd. The Montreal Neurological Institute: training of the first African-American neurosurgeons. *J Natl Med Assoc.* 2007 Sep;99(9):1071-3. PMID: 17913121; PMCID: PMC2575875. 10.3171/2020.12.FOCUS20945. PMID: 33789225.
- <https://www.aansneurosurgeon.org/feature/racial-background-in-neurosurgerys-eco-system/>

# Bibliography (cont'd)

- <https://www.thoughtco.com/african-american-history-timeline-1910-1919-45426>
- <https://www.thoughtco.com/african-american-history-timeline-1900-1909-45430>
- <https://onlineexhibits.library.yale.edu/s/harvey-cushing/page/home>
- <https://www.viewfromthecrownsnest.com/home/2018/2/5/dr-clarence-sumner-greene-sr-first-board-certified-black-neurosurgeon-in-the-united-states#:~:text=Clarence%20Sumner%20Greene%2C%20Sr.,he%20lived%20with%20his%20Aunt.>
- <http://www.faqs.org/health/bios/15/Jesse-B-Barber-Jr.html>
- Doyle NM, Doyle JF, Walter EJ. The life and work of Harvey Cushing 1869-1939: A pioneer of neurosurgery. J Intensive Care Soc. 2017 May;18(2):157-158. doi: 10.1177/1751143716673076. Epub 2016 Oct 24. PMID: 28979564; PMCID: PMC5606407.
- <https://www.science.org/content/article/two-reports-and-worlds-they-made>
- Griffen WO Jr. Jacob: the other Flexner. Ann Surg. 2004 Jun;239(6):808-17. doi: 10.1097/01.sla.0000128684.67062.39. PMID: 15166960; PMCID: PMC1356289.
- <http://t3.gstatic.com/licensed-image?q=tbn:ANd9GcSfCqdlqh-Nx1PrCd4F7VF9ThkdUFd6LK0s0409wbLauxqvp84dD5VlrxhRAXZhBSKDFcQDneHFVHFxuvU>
- [http://t3.gstatic.com/licensed-image?q=tbn:ANd9GcSrsrD341M945unSXp26gUDn9YliFUcJZyjOcCPywP\\_PTZa\\_fZnO0GITSt8JOF0GXCvocceo4JwffJ3dMk](http://t3.gstatic.com/licensed-image?q=tbn:ANd9GcSrsrD341M945unSXp26gUDn9YliFUcJZyjOcCPywP_PTZa_fZnO0GITSt8JOF0GXCvocceo4JwffJ3dMk)
- [https://en.wikipedia.org/wiki/General\\_Education\\_Board](https://en.wikipedia.org/wiki/General_Education_Board)





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