

**DISTRIBUTIVE JUSTICE AND THE MANAGEMENT
OF ORTHOPAEDIC TRAUMA**

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ABSTRACT

Distributive justice is a bioethical principle concerned with the fair distribution of resources and benefits in society. In the context of orthopaedic surgery management, distributive justice is an important consideration in ensuring that all patients have equal access to the resources and care in the treatment of their injuries. The literature well documents demographic and socioeconomic factors in the allocation of elective orthopaedic surgeries, but unfortunately a similar analysis is lacking when it comes to orthopaedic trauma surgeries. This study examines fundamental philosophical perspectives that underly healthcare delivery specifically pertaining to orthopaedic trauma. In doing so, the influence of race, socioeconomic status, insurance status and other factors on access to care and allocation of resources are described. Findings for various orthopaedic trauma surgery cases suggest decreased allotment to those of black race, lower socioeconomic, educational, and non-insurance status. Although the reason is multifactorial and complex, I suggest a shift in focus to the equity and fair distribution of surgical resources by considering the role of population health, understanding multidisciplinary interactions, improving research methodology, and community partnership.

To my future patients.

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CHAPTER 1: INTRODUCTION

Compared to other countries, the United States underperforms in healthcare delivery, despite being one of the most significant contributors to the countries' capita. Improving healthcare delivery in the United States is vital for several reasons and was described in 2002 by the Institute of Medicine (US) Committee on Assuring the Health of the Public in the 21st Century. Firstly, it can improve the overall health and well-being of the population, leading to increased productivity and quality of life. It can also reduce healthcare costs by preventing and managing chronic diseases, which can be expensive to treat. Additionally, improving healthcare delivery can increase access to care for underserved populations, such as those living in rural areas or low-income communities. This can help to reduce health disparities and promote equity in healthcare. Finally, improving healthcare delivery can also further contribute to the country's economic growth by creating jobs in the healthcare industry and fostering innovation in medical technology and research. After discussing the importance of healthcare delivery, the rest of the thesis will describe rationing and distributive justice in managing orthopaedic trauma while focusing on the influence of race and several socioeconomic factors.

Rationing

An essential part of healthcare delivery is rationing. Due to limitations, rationing means restricting some people's access to valuable or potentially useful health services (Keliddar et al., 2017). It is no news that an unlimited supply of healthcare resources does not exist. The reason is that attempting to meet all healthcare needs of everyone would likely overwhelm the system's capacity to supply essential elements of other social goods,

such as public safety, education, and defense. Therefore, whether one likes it or not, rationing these resources occurs for society's well-being. Rationing is integral to healthcare delivery because it involves making decisions about allocating resources, such as medical staff, equipment, and medications. Healthcare providers often prioritize certain patients or treatments over others based on medical needs, expected outcomes, and available resources. This can involve making difficult decisions about which patients to treat first or which treatments are most likely adequate.

Rationing can also occur at a broader level, such as allocating healthcare funding or developing healthcare policies. For example, policymakers may need to decide which healthcare programs to fund or which populations to prioritize for specific treatments or services. While rationing can be controversial and raise ethical concerns, discussing it in healthcare delivery is often necessary due to the finite nature of resources and the need to balance competing demands for care. Overall, rationing looks different in various settings, but what remains the same is the determination of who gets what when it comes to multiple resources such as physician time, medical devices, operating time, among many other conditions—also known as distribution. In addition, demand, time limits, scarcity, behavior, and urgency can further amplify rationing.

This thesis will focus on rationing, specifically in orthopaedic surgery. As with other medical specialties, orthopaedic surgery, and its large patient population are not immune to rationing, especially when limited resources are available, such as hospital beds, equipment, or medical professionals. The COVID-19 pandemic has significantly impacted every part of the healthcare system, including orthopaedic surgery. During the early stages of the pandemic, many hospitals and healthcare facilities postponed or

canceled elective surgeries, including many orthopaedic surgeries, to conserve resources and reduce the risk of COVID-19 transmission. Unfortunately, this led to significant delays in care for many patients with musculoskeletal conditions, particularly those with non-urgent or elective procedures.

Overall, the COVID-19 pandemic highlighted the importance of flexibility, adaptability, and innovation in orthopaedic surgery and the need for continued research and development of new treatments and techniques that can help improve patient management and outcomes and reduce the impact of future pandemics. First, however, assessing how the field is currently doing is critical to take that next step.

Orthopaedic Surgery

Orthopaedic surgery is a branch of medicine focused on diagnosing, treating, and preventing musculoskeletal system conditions. The musculoskeletal system comprises the body's bones, cartilage, ligaments, joints, muscles, and tendons. According to the World Health Organization, musculoskeletal conditions are the leading contributor to disability worldwide. This makes approximately 1.71 billion people with musculoskeletal conditions worldwide. In the United States, it is well documented in the literature that racial and socioeconomic disparities exist in managing musculoskeletal conditions requiring elective orthopaedic care. Elective surgery, according to the American Academy of Orthopaedic Surgeons (AAOS), is classified as surgery to treat chronic musculoskeletal problems, where if the option were to delay the surgical procedure, there would not be significant harm to the patient or the eventual outcome (Guy et al., 2020). The disparities in the rationing and availability of these surgeries are intensified by

underlying factors such as patient willingness to undergo surgery, access to high-volume surgical centers, and cost (Zelle et al., 2019).

On the other hand, the analysis of these disparities existing outside of elective orthopaedic surgeries and within orthopaedic trauma surgeries are still limited in the literature. Orthopaedic trauma is an injury caused by an external force that affects the musculoskeletal system, most often from a fall or car accident. Surgeries to treat trauma are not elective because if not obtained by the patient, the results will surely be detrimental to the patient. In the United States, the burden of orthopaedic trauma cases is high. A total of 7,214,915 patients were diagnosed with orthopaedic injury in 2013-2014, resulting in 1,167,656 emergency orthopaedic surgical procedures. Within this type of musculoskeletal injury classification, fall-related injuries accounted for 51% of healthcare encounters and 61% of emergency orthopaedic surgical procedures (Jarman et al., 2021). With this high volume comes a demand for resources to care for these patients. As stated, demand, time limits, scarcity, behavior, and urgency amplify resource rationing. Therefore, it is crucial to analyze the distribution of these resources and discuss the basis on which it occurs, especially with the projected rise in the need for orthopaedic surgeries outpacing the orthopaedic surgeon's capacity.

Physicians, in this case, orthopaedic surgeons, have a role to play in equitable healthcare delivery. Orthopaedic surgeons must deliver equitable care because every patient deserves the same level of care and attention, regardless of race, ethnicity, gender, socioeconomic status, or any other personal characteristic. Equitable healthcare results in a more efficient system, more access to care, better patient health outcomes, and the elimination of disparities. This paper aims to discuss bioethical principles in healthcare

delivery and the effect of race and socioeconomic factors such as income, insurance, geographic location, educational level, and occupation on the management of musculoskeletal injuries, specifically orthopaedic trauma.

CHAPTER 2: PRINCIPLES AND VALUES

Through the course work with the Urban Bioethics Program, we have been given tools to advocate for our patients. We have also practiced putting these tools into place through community engagement. My next aim is to use the tools learned to analyze my future field of practice, orthopaedic surgery, with hopes of bringing awareness and suggestions for improvements for the benefit of our patients and communities.

In 1979 *The Principles of Biomedical Ethics* by Beauchamp and Childress were created. From this birthed four key bioethical concepts: autonomy, non-maleficence, beneficence, and justice. Autonomy puts the power in the patient's hands and is known as the right to decide without the coercion or influence of others. Non-maleficence, in the simplest terms, is the act of not harming. Beneficence is the moral obligation to do what suits the patient's benefit and keeps their best interest in mind. Both non-maleficence and beneficence are at the will of the medical provider. Justice denotes the fair and equitable distribution of health resources. Justice is also still at the medical provider's will but also encompasses a broader task force behind it.

Justice can further be subdivided into multiple parts. Restorative justice tries to reinstitute relationships to their rightness by addressing harm and conflict (Wenzel et al., 2008). In orthopaedics, this may look like operating on the wrong limb and the surgeon accepting full responsibility for what has happened, doing their best to repair the harm to the patient, and working to reduce repeat offenses. This is all completed while aiming to strengthen the bond with the patient. Retributive justice is based on punishment for doing something wrong equal to the initial offense (Wenzel et al., 2008). Using the same

example above, retributive justice for operating on the wrong limb would look like the dismissal of the surgeon from their job at the hospital instead of receiving a warning or even no consequence. Procedural justice is focused on how fairly people are treated. It would be the same retributions for every patient anytime that circumstance happens. For the example above, it would be the same punishment for every surgeon in that situation. Finally, distributive justice is the determination of who gets what. Healthcare provides services based on needs and resources (Ambrose et al., 2005). Although a perfect plan for deciding who gets what is yet to be achieved, several philosophical perspectives can influence decision-making within distributive justice.

The Egalitarian theory is based on the idea that everyone should be treated the same because all people are equal. This equality in the distribution of resources spans all persons, regardless of race, gender, religion, economic status, and political belief (Scheffler, 2003). The Utilitarian theory believes that resources should be partitioned based on what produces the most benefit for society. It is deciding on the grounds of doing a tremendous amount of good for the most significant amount of people (Scarre, 1996). The Libertarian theory emphasizes rights to social and economic liberty. In other words, it removes government control and values individual freedom (Watner, 1982). This means the people decide themselves—a free for all. The Communitarian theory stresses principles and practices of justice that evolve through tradition in a community (Bell, 2001). In this case, justice is not determined by the individual's idea of what resources are needed but is made on the common good of the community and what they value. John Rawls was a prominent political philosopher who proposed a theory of justice in his 1971 book "A Theory of Justice." Rawls believed that every person is

subjected to a fair opportunity to receive a resource. In other words, this is justice conditioned on equality and not equity. Of all these philosophical perspectives, the Egalitarian theory, Rawls's theory of justice, and equality underpin distributive justice.

The American Academy of Orthopaedic Surgeons (AAOS) was founded in 1933. It is the governing body of orthopaedic practices across the country, and its mission is "serving our profession to provide the highest quality musculoskeletal care." Providing the highest quality of care should be accessible to every patient, every time. Individuals' right to healthcare resources should not be affected by who they are. Since it is the orthopaedic profession's mission, it is critical to evaluate performance in achieving this goal under the core philosophical perspectives underlying distributive justice.

CHAPTER 3: DISTRIBUTIVE JUSTICE, EQUITY AND THE MANAGEMENT OF ORTHOPAEDIC TRAUMA

A 2002 Institute of Medicine report revealed that across healthcare, minorities receive fewer procedures and lower quality medical care than their White counterparts (Smedley et al., 2003). What exactly does this look like specifically in orthopaedic surgery? The literature has been forthcoming when discussing these topics in certain parts of orthopaedic surgery compared to others. Specifically, the effects and causes of these variances in elective orthopaedic surgeries have been well documented.

Both socioeconomic and demographic factors have been suggested to contribute to differences in healthcare utilization for elective orthopaedic procedures. Once again, elective surgeries are subject to one's choice. This can be at the discretion of the patient or the doctor. In orthopaedics, examples of elective surgeries include arthroplasty, also known as a joint replacement, upper and lower extremity, and spinal surgeries. Within the umbrella of these types of surgeries, multiple disparities have been identified around managing patients and how it affects their access to care.

These have been described in multiple cases, such as the procedure involving elective femoral implant removal in pediatric populations. This is one of the most common procedures pediatric orthopaedic surgeons perform after the initial fixation of the fracture. Although there is not a specific criterion established for implant removal in pediatric populations, it is often due to concern with the interference of growth of the child or from complications such as infection or pain. Despite the reason for the removal of the implant, there was a higher likelihood of surgery for patients that fall within the

group of white race and a higher socioeconomic status. Although this relationship is specifically evident within this elective orthopaedic procedure, the exact cause is yet to be pinpointed. Some suspected reasons include a lack of evidence-based guidelines for implant removal, surgeon bias, variations in reimbursement, or disparities in access to care (Dodwell et al., 2016).

Another set of elective cases where these disparities are well described is shoulder arthroplasties, also known as shoulder replacement surgeries. Over time from normal wear and tear, the shoulder becomes damaged, and arthritis develops. Non-surgical treatment is initially used to reduce pain, while persistent pain and limited mobility necessitate the surgical intervention of replacing the joint. Regarding total shoulder arthroplasties, there is evidence supporting disparities in surgical utilization. From 1998-2011, it was recorded from a US Nationwide Inpatient Sample that 176,141 Whites and 7694 Blacks underwent a total shoulder arthroplasty. Compared to Whites, Blacks had a much lower total shoulder arthroplasty utilization rate in 1998 (2.97 vs. 0.83; $p < 0.0001$) and in 2011 (12.27 vs. 3.33; $p < 0.0001$); racial disparities increased from 1998 to 2011 ($p < 0.0001$) (Singh et al., 2015). The gap in utilization did not stop there. In 2011 a continuation study revealed that from 2011-2017, 91.4% of the patients undergoing any shoulder arthroplasty procedure were White, 4.75% were Black, and 3.85% were Hispanic (Farley et al., 2022). In this study, the differences in utilization rates found persisted despite the prevalence of arthritis being equivalent between Whites and Blacks, even though Blacks had higher arthritis-attributable limitations. These gaps in management and disparities have also been seen in other arthroplasties, such as knee and

hip. Still, the reason for the observed disparities is unclear, and the mechanism is likely both complex and multifactorial.

In efforts to address health equity and the implementation of distributive justice within the surgical management of orthopaedic trauma it is essential to analyze disparities in care regarding various social and racial determinants of health. Particularly when this comes to trauma surgery, history has shown that Black patients have an increased risk of mortality. This relationship is genuine even after factoring in injury severity and mechanism. Therefore, in the next chapter, I will start by discussing the influence of race.

CHAPTER 4: RACE

Race and its partner racism are significant influences within the United States health system and contribute to the never-ending whirlwind of problems within it. Its influence within the health systems stems from its effect on the clinical decision-making process, its indifference to the plight of the minority health crises, its maintenance of discriminatory barriers and access to care, to the unfair and biased treatment of black and brown healthcare professionals. However, first, it is essential to define what race is.

The definition of race has evolved since the 16th century. The initial definition of race was used to classify human beings, i.e., type, kind, or sort. However, with scientific findings providing evidence of the evolution of the Homo sapiens and the unity of genetic and DNA data among human beings, race has expanded to be defined as a sociocultural concept. This is represented as people who share the same religion, language, etc. Racism, on the other hand, is when a group of people who share these things is treated differently. This differential treatment is often based on stereotypical thinking, discriminatory institutions, social structures, and myths.

The origins of Critical Theory were established by Max Horkheimer in 1937 in his essay "Traditional and Critical Theory." There he hoped to challenge society to critique and make changes about humanity rather than to describe them. Decades later arose Critical Race Theory, initially coined in Law to dismantle colorblindness. Legal scholars following the Civil Rights Movement through Critical Race Theory portrayed that racism is embedded within our society and still exists within the laws, policies, and institutions. Moreover, in calling these matters out, the aim was to dismantle these

structural inequities and systemic racism. Critical Race Theory is now used in the contribution of the following: a comprehensive framework for connecting these research endeavors, a vocabulary for advancing understandings of racial constructs and phenomena, critical analyses of knowledge production processes, and praxis that builds on community-based participatory approaches linking research, practice, and communities (Ford et al., 2015). Critical Race Theory can shed light on race-based clinical decision-making in its application. Furthermore, as stated before, the recent COVID-19 pandemic further exposed such matters.

During the COVID-19 pandemic, the country's long history of healthcare inequities was put on the front stage. Healthcare inequities, such as access to healthcare, were further exacerbated in many ways. Specifically, access to healthcare was limited due to social distancing measures, lockdowns, and overwhelming healthcare systems. People in low-income and marginalized communities had even less access to healthcare facilities, doctors, and other resources, making them more vulnerable to the disease. Of course, these inequities in the rationing of medical care during this time were not exempt from existing within the realm of orthopaedics. Furthermore, a national US survey in 2017 noted that approximately 22% of Black adults avoided seeking medical care during this time out of fear of discrimination (Robert Wood Foundation, 2017).

It is apparent in the orthopaedic trauma literature that the minority and Black race has been associated with a lower likelihood of operative management than the White race. For example, Chung et al. in 2011 described that although there was a total increase in Medicare populations being treated with open reduction internal fixation (ORIF) of distal radius fractures, Black patients were less likely to be treated with ORIF compared

to Whites. The authors in this study suggest that this discrepancy is likely due to the belief that Black patients have a lower risk of osteoporosis, making them more likely to tolerate non-surgical management better. This same relationship was observed in the 2019 Zelle et al. study on calcaneal fractures. For patients undergoing management of calcaneal fractures, race, and ethnicity were significantly different between the non-operative and the operative group ($p < 0.001$), whereby the rates of surgical fixation were lower among African American and Hispanic patients.

Overall, the bioethical implications of race in healthcare delivery are numerous and complex. This chapter describes the history of race and its emergence as a social construct. Race has also been used to create and maintain health disparities recently exacerbated by the COVID-19 pandemic. People of color are more likely to have less access to healthcare resources than White people, particularly in managing orthopaedic trauma and surgery. This has been due to structural racism, discrimination, and implicit bias in healthcare delivery. Therefore, healthcare providers must be aware of these implications and work to ensure that all patients receive equitable and high-quality care, regardless of their race or ethnicity. In the next chapter, I will comb through the influence of several socioeconomic factors.

CHAPTER 5: SOCIOECONOMIC STATUS

Income and Occupation

In 2023, the Department of Health and Human Services lists the federal poverty level for individuals as an annual income of \$13,590. Moreover, according to the United States Census, 12.8% of Americans live in poverty or with incomes below the federal poverty level. Poverty often occurs in concentrated areas and exists for a multitude of time as well as its effect. To discuss the cause of poverty is to address systemic factors that lead to the unequal social and economic opportunities that result. Nonetheless, lower incomes and poverty are the tip of the iceberg of many considerable complications created in one's health.

Low-income Americans face more significant barriers and hardships in accessing medical care than higher-income Americans. In 2019 Zelle et al. published about the decreased utilization of open reduction internal fixation for the management of closed calcaneal fractures in minority patients from lower-income zip codes. In addition, the authors also found that median zip code income significantly influenced the type of treatment. Income status is significant from both the view of the surgeon and their decision strategy, but also the view of the patient in terms of location and access. Low income does not act alone; it also interplays with other socioeconomic factors. For example, low-income people are more likely to be uninsured, struggling with food insecurities, shelter, safe neighborhoods, etc. The following section aims to identify how insurance status leads to the misdistribution of orthopaedic surgical procedures.

Insurance

Insurance can significantly impact access to healthcare and the type of treatment one receives. According to the United States Census Bureau, in 2019, approximately 26.1 million Americans, or 8% of the population, did not have health insurance coverage. Moreover, even so, this number is likely to have increased due to the COVID-19 pandemic and its economic impacts. Individuals with insurance are typically more likely to access healthcare services than those without insurance. This is because insurance can help to reduce the financial barriers to accessing healthcare services. For example, individuals with insurance are more likely to be able to afford preventive care, such as regular check-ups and screenings, which can help to identify and treat health issues before they become more serious. Additionally, insurance can help to cover the costs of more expensive medical services, such as surgeries or hospitalizations, which may be unaffordable for those without insurance. For example, Zelle et al. published a study in 2019 on the decreased utilization of open reduction internal fixation in minority patients without private insurance to manage closed calcaneal fractures.

However, it is essential to note that despite having insurance, it does not guarantee access to care. Some insurance plans may have high deductibles or copays, making it difficult for individuals to afford necessary medical care. Also, not all healthcare providers accept all types of insurance, which can limit an individual's choice of providers. Additionally, insurance status showed a significant influence on the type of treatment. This was especially seen in the traumatic management of clavicle fractures. Congiusta et al. in 2019 found more effective use of surgery among adult patients with clavicle fractures who have private insurance than those with nonprivate or no insurance.

Patients without insurance were the least likely to undergo surgery and had lower odds (OR, 0.63; 95% CI, 0.60-0.66; $p < 0.001$), followed by those with Medicare (OR, 0.73; 95% CI, 0.70-0.78; $p < 0.001$) and those with Medicaid (OR, 0.74; 95% CI, 0.69-0.78; $p < 0.001$). They attribute this difference to underlying healthcare disparities in the inpatient population and implicit bias in a surgeon's decision-making based on the insurance status or type. Based on these studies, it is evident that insurance status can influence the allocation of healthcare resources and rationing; and surgeons should allocate surgeries based on need, not on insurance. After discussing how insurance status can impact access to healthcare and make people more vulnerable in the management of orthopaedic trauma, next, I will discuss the impact of geographic location.

Geographic Location

Geographic location discusses access, supply, diversity, and distribution of services. Therefore, it is evident that geographic location directly impacts patient care. It can affect the management options and physical access to care because physicians and surgeons often reside in the wealthiest neighborhoods and cities. Nearly 20% of the American population resides in rural communities, but only 9% of the physician workforce serves these areas. This trend is exacerbated among specialist physicians, including orthopaedic surgeons (Fu et al., 2013; Rosenblatt et al., 2000). This, therefore, lends many patients in poorer neighborhoods and rural areas access to the same type of care. This is not to say that care within these areas is always substandard, but it speaks of the limitations of having access compared to other geographical locations.

The same dichotomy exists within the realm of the management of orthopaedic trauma. Notably, the incidence of orthopaedic injury and the volume of injury patients per orthopaedic surgeon varies substantially across the United States. Specifically, this has been reported in the literature about using open reduction and internal fixation of distal radius fractures. Furthermore, the use of this operative management has varied in the country. Clusters of high use are noted to be concentrated in the upper Midwest, the West, southern Texas, and portions of the Southeast. Clusters of the low use of open reduction and internal fixation were reported mainly in the Northeast. These variations were noted from patient and physician factors—particularly the access to hand specialists within that region. Hand specialists are also more likely to implement new and expensive innovations in treating these fractures (Chung et al., 2011). Furthermore, as stated before, income and surgery costs limit access to such technologically advanced care.

It is impossible to discuss the impact of geographic location in the distribution and management of orthopaedic care without discussing it from an urban bioethical lens. Urban bioethics examines density, diversity, and disparity, how it affects urban populations' health, and the ethical concerns that manifest because of them. This field then goes further to create interventions to affect change within this population. It is essential to distinguish that although two cities are never the same in terms of size, physical layout, population density, ethnocultural composition, and so forth, a city can still be defined in the words of Wirth in 1938, a member of the famed Chicago school of urban sociology, as a "relatively large, dense, and permanent settlement of socially heterogeneous individuals." Urban Bioethics also works to develop and implement health policy for a culturally, ethnically, and religiously diverse society. It also provides the

framework to educate and propel culturally competent providers in treating a diverse and unique group of individuals (Bluestein et al., 2004).

Education

Everyone is not afforded the same level of education. With variations in education comes an inevitable divide between people when it comes to understanding various topics and how one might come to see and experience them. Therefore, this influences not only the patient-physician relationship but the management they receive as well. It is no news that education impacts health literacy, meaning high levels of education are often associated with higher health literacy. Conversely, poor health literacy has been associated with inadequate comprehension of surgical procedures, conflict in weighing options/risks and benefits in surgical management, and compliance with preoperative protocols.

In 2015 De Oliveria et al. published a review of 10 studies on health literacy. They found low health literacy in specific surgical populations such as transplant and orthopaedic patients. Low health literacy was associated with nonadherence to preoperative or discharge instructions and poor comprehension of surgical procedures within these selected populations. This is a defined problem, but unfortunately, much of the orthopaedic literature still lacks on how these things impact patients. The ethical principle of distributive justice stems from initial education properties and surgical allotment—educational interventions to promote health literacy within populations.

CHAPTER 6: CONCLUSION

Health disparities exist before all our eyes, and the management of orthopaedic trauma is very complex. This intricate decision-making process is undoubtedly influenced by patients' preferences as well as surgeons' preferences, which potentially may be associated with the risk of introducing bias based on the patient's socioeconomic status and demographics. Why does this matter? It matters because these vulnerable populations are subjected to health conditions exacerbated by inadequate management of their initial disease.

After documenting the existing inequities, ways to address these disparities remain. The focus now is on equity and fair distribution. The U.S. Department of Health and Human Services and Healthy People in 2020 defined health equity as the "attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities." In 2014, Srinivasan et al., in "Transitioning from Health Disparities to a Health Equity Research Agenda: The Time Is Now," describe methods for making this shift. This involves considering the role of population health in research and interventions. This means not only acknowledging individual variables but investigating the broader environmental factors as well. An example is the Shape Up Somerville Project. This citywide program in Massachusetts aimed to promote healthier eating habits and increased physical activity. They achieved this by targeting not only individual factors such as education and behaviors towards a healthier lifestyle but

environmental factors by changing schools, community and civic organizations, public safety, and food policies.

The authors also propose the importance of understanding complex, multidisciplinary, multilevel, and multifactorial interactions. Specifically, the interactions between genetic, biological, behavioral, and environmental factors. This involves understanding the manifestation of medical conditions from the molecular to the societal level. The National Institute of Health (NIH) Centers for Population Health and Health Disparities (CPPHD) has already started implementing this in its research for cardiovascular and cancer outcomes by attacking this at multiple levels—social, behavioral, biological, and genetic. Another step on the agenda is to improve research methodologies and statistical analytical techniques. This was proposed by working together in unison for intervention strategies and implementation. This is important because these disparate groups are often isolated and scattered. Another part of the proposed framework is to build on community resiliency and partnership. This highlight focuses on the strength and resources of the community instead of the deficit and empowers members to inform policies and be actively involved in the change. Finally, the authors emphasize the importance of continuing to develop the research around the topic and the professional workforce. Not only is multidisciplinary involvement vital, but also who is on the team—in other words, partnering with federal agencies, universities, healthcare systems, and community organizations to create a diverse workforce. For example, the Health Resources and Service Administration (HRSA) workforce training program aims to minimize inequities in care and promote health equity by training a task

force from those marginalized and underrepresented groups and increasing their numbers in the health profession.

Therefore, I propose the best way to address this problem on three levels: local, institutional, and national, using the previously established framework. Local and national levels with the American Academy of Orthopaedic Surgeons (AAOS) and Orthopaedic Trauma Association (OTA). Although it is ambitious to try and combine these large groups, initially, it is reasonable to start with funding smaller-scale projects and to link them together through common themes, metrics, and measures that could ultimately achieve the goal of addressing these disparities and promoting equity. At the national level, there are also groups such as Nth Dimensions and Ruth Jackson Orthopaedic Society (RJOS) that aim to support minority students that are interested in the orthopaedic surgery field. However, more must be done to support these other communities. An example would be targeting rural communities and having initiatives to keep doctors in those regions. Specifically, regions with high patient volume and average patient-to-provider ratios may be ideal settings for orthopaedic trauma training programs or post-fellowship professional opportunities. Another initiative is to start early and recruit community members into the health profession and, eventually, the field of orthopaedics. Currently, only 2% of orthopaedic surgeons in the United States are Black or African American. This number does not reflect the population that is treated. Especially the population that is seen in these orthopaedic trauma cases. Therefore, considering these things above, the hope is to overall improve patient health delivery and curb the effects of misdistribution.

BIBLIOGRAPHY

- AAOS Board of Directors. (2018). *AAOS Strategic Plan: 2019-2023*. AAOS. <https://www.aaos.org/about/meet-the-aaos/aaos-strategic-plan-2019-2023/>
- Ambrose, M. L., & Arnaud, A. (2005). Are Procedural Justice and Distributive Justice Conceptually Distinct? In J. Greenberg & J. A. Colquitt (Eds.), *Handbook of organizational justice* (pp. 59–84). Lawrence Erlbaum Associates Publishers.
- Beauchamp, T. L., & Childress, J. F. (1979). *Principles of Biomedical Ethics*. Oxford: Oxford University Press.
- Bell, D. (2001). Communitarianism. *The Stanford Encyclopedia of Philosophy*. Edited by Zalta EN.
- Blustein, J., & Fleischman, A. R. (2004). Urban bioethics: adapting bioethics to the urban context. *Academic medicine: Journal of the Association of American Medical Colleges*, 79(12), 1198–1202. <https://doi.org/10.1097/00001888-200412000>
- Congiusta, D. V., Amer, K. M., Merchant, A. M., Vosbikian, M. M., & Ahmed, I. H. (2019). Is Insurance Status Associated with the Likelihood of Operative Treatment of Clavicle Fractures? *Clinical orthopaedics and related research*, 477(12), 2620–2628. <https://doi.org/10.1097/CORR.0000000000000836>
- Chung, K. C., Shauver, M. J., Yin, H., Kim, H. M., Baser, O., & Birkmeyer, J. D. (2011). Variations in the use of internal fixation for distal radial fracture in the United States Medicare population. *The Journal of Bone and joint surgery. American Volume*, 93(23), 2154–2162. <https://doi.org/10.2106/JBJS.J.012802>
- De Oliveira, G. S., Jr, McCarthy, R. J., Wolf, M. S., & Holl, J. (2015). The impact of health literacy in the care of surgical patients: a qualitative systematic review. *BMC surgery*, pp. 15, 86. <https://doi.org/10.1186/s12893-015-0073-6>
- Department of Health and Human Services. (2023). Annual Update of the HHS Poverty Guidelines. In *Federal Register* (88 FR 3424). <https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines>
- Dickman, S. L., Himmelstein, D. U., & Woolhandler, S. (2017). Inequality and the healthcare system in the USA. *Lancet (London, England)*, 389(10077), 1431–1441. [https://doi.org/10.1016/S0140-6736\(17\)30398-7](https://doi.org/10.1016/S0140-6736(17)30398-7)

- Dodwell, E., Wright, J., Widmann, R., Edobor-Osula, F., Pan, T. J., & Lyman, S. (2016). Socioeconomic Factors Are Associated With Trends in Treatment of Pediatric Femoral Shaft Fractures, and Subsequent Implant Removal in New York State. *Journal of pediatric orthopedics*, 36(5), 459–464. <https://doi.org/10.1097/BPO.0000000000000494>
- Farley, K. X., Dawes, A. M., Wilson, J. M., Toston, R. J., Hurt, J. T., Gottschalk, M. B., Navarro, R. A., & Wagner, E. R. (2022). Racial Disparities in the Utilization of Shoulder Arthroplasty in the United States: Trends from 2011 to 2017. *JB & JS open access*, 7(2), e21.00144. <https://doi.org/10.2106/JBJS.OA.21.00144>
- Ford, C. L., & Airhihenbuwa, C. O. (2010). Critical Race Theory, race equity, and public health: toward antiracism praxis. *American journal of public health*, 100 Suppl 1(Suppl 1), S30–S35. <https://doi.org/10.2105/AJPH.2009.171058>
- Fu, M. C., Buerba, R. A., Gruskay, J., & Grauer, J. N. (2013). Longitudinal urban-rural discrepancies in the US orthopaedic surgeon workforce. *Clinical orthopaedics and related research*, 471(10), 3074–3081. <https://doi.org/10.1007/s11999-013-3131-3>
- Guy, D. K., Bosco, J.A., Savoie, H. A. (2020). *AAOS Guidelines for Elective Surgery During the COVID-19 Pandemic*. The American Academy of Orthopaedic Surgeons. <https://www.aaos.org/about/covid-19-information-for-our-members/aaos-guidelines-for-elective-surgery/>.
- Institute of Medicine (US) Committee on Assuring the Health of the Public in the 21st Century. (2002). *The Future of the Public's Health in the 21st Century*. National Academies Press (US).
- Institute of Medicine (US) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, Smedley, B. D., Stith, A. Y., & Nelson, A. R. (Eds.). (2003). *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. National Academies Press (US).
- Jarman, M. P., Weaver, M. J., Haider, A. H., Salim, A., & Harris, M. B. (2021). Geographic Distribution of Orthopaedic Trauma Resources and Service Use in the United States: A Cross Sectional Analysis. *The Journal of surgical research*, 267, 328–335. <https://doi.org/10.1016/j.jss.2021.05.042>
- Jarman, M. P., Weaver, M. J., Haider, A. H., Salim, A., & Harris, M. B. (2020). The National Burden of Orthopedic Injury: Cross-Sectional Estimates for Trauma System Planning and Optimization. *The Journal of surgical research*, 249, 197–204. <https://doi.org/10.1016/j.jss.2019.12.023>

- Johnson, C. T., Tran, A., Preslar, J., Bussey-Jones, J., & Schenker, M. L. (2022). Racial Disparities in the Operative Management of Orthopedic Trauma: A Systematic Review and Meta-Analysis. *The American surgeon*, 31348221121561. Advance online publication. <https://doi.org/10.1177/00031348221121561>
- Keliddar, I., Mosadeghrad, A. M., & Jafari-Sirizi, M. (2017). Rationing in health systems: A critical review. *Medical journal of the Islamic Republic of Iran*, 31, 47. <https://doi.org/10.14196/mjiri.31.47>
- Robert Wood Johnson Foundation. (2017). *Discrimination in America: Experiences and Views of African Americans*.
- Rosenblatt, R. A., & Hart, L. G. (2000). Physicians and rural America. *The Western journal of medicine*, 173(5), 348–351. <https://doi.org/10.1136/ewjm.173.5.348>
- Singh, J. A., & Ramachandran, R. (2015). Persisting Racial Disparities in Total Shoulder Arthroplasty Utilization and Outcomes. *Journal of racial and ethnic health disparities*, 2015, 1–8. <https://doi.org/10.1007/s40615-015-0138-3>
- van Ryn, M., & Burke, J. (2000). The effect of patient race and socioeconomic status on physicians' perceptions of patients. *Social science & medicine* (1982), 50(6), 813–828. [https://doi.org/10.1016/s0277-9536\(99\)00338-x](https://doi.org/10.1016/s0277-9536(99)00338-x)
- Rawls, J. (1971). *A Theory of Justice: Original Edition*. Harvard University Press. <https://doi.org/10.2307/j.ctvjf9z6v>
- Scarre, G. (1996). *Utilitarianism*. Psychology Press.
- Scheffler, S. (2003). What is egalitarianism?. *Philosophy & public affairs*, 31(1), 5-39.
- Singh, J. A., & Ramachandran, R. (2015). Persisting Racial Disparities in Total Shoulder Arthroplasty Utilization and Outcomes. *Journal of racial and ethnic health disparities*, 2015, 1–8. <https://doi.org/10.1007/s40615-015-0138-3>
- Srinivasan, S., & Williams, S. D. (2014). Transitioning from health disparities to a health equity research agenda: the time is now. *Public health reports (Washington, D.C. : 1974)*, 129 Suppl 2(Suppl 2), pp. 71–76. <https://doi.org/10.1177/00333549141291S213>
- U.S. Census Bureau (2019). Health Insurance Coverage in the United States: 2019. Retrieved from [<https://www.census.gov/library/publications/2020/demo/p60-271.html#:~:text=Highlights&text=In%202019%2C%208.0%20percent%20of,of%202019%20was%2092.0%20percent>].
- Watner, C. (1982). The Proprietary Theory of Justice in the Libertarian Tradition. *Journal of Libertarian Studies*, 6(3-4), 289-316.

Wenzel, M., Okimoto, T. G., Feather, N. T., & Platow, M. J. (2008). Retributive and restorative justice. *Law and human behavior*, 32(5), 375.

Wirth, L. (1938). Urbanism as a Way of Life. *American Journal of Sociology*, 44(1), 1-24. <http://www.jstor.org/stable/2768119>

Zelle, B. A., Morton-Gonzaba, N. A., Adcock, C. F., Lacci, J. V., Dang, K. H., & Seifi, A. (2019). Healthcare disparities among orthopedic trauma patients in the USA: socio-demographic factors influence the management of calcaneus fractures. *Journal of orthopaedic surgery and research*, 14(1), 359. <https://doi.org/10.1186/s13018-019-1402-8>