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Editorial

# The Drive for Health Equity - The Need to Use Technology to Reduce Healthcare Disparities in Orthopedics

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Health and healthcare disparities occur across a range of dimensions—including socioeconomic status, age, geographical location, language, and gender—and are reflected in variable rates of disease, disability, and death, as well as life expectancy. Members of disadvantaged groups are more likely to have poor health status in addition to more limited means and ability to access healthcare services.

Within orthopedic care, existing literature has long identified various health and healthcare disparities, including significantly lower rates of total hip arthroplasty (THA) and total knee arthroplasty (TKA) among Black and Hispanic patients, as well as higher amputation rates among Black and Mexican American diabetic patients. While such studies have for decades identified the presence and impact of healthcare disparities among minority and disadvantaged populations, action to improve health equity in orthopedics has been scarce.

To make meaningful progress on health equity, health systems and Ambulatory Surgery Centers will first need to identify existing barriers to care that impact their own patient populations, particularly as new legislation will require organizations to document how they screen patients for social determinants of health, analyze patient data, and address healthcare disparities. Digital care management, remote monitoring, and messaging platforms can help health systems and ASCs improve the quality, consistency, and availability of the care they deliver.

As orthopedic care can potentially improve the health and well-being of so many Americans, it is crucial that we commit to resolving disparities in orthopedic care access, utilization, and outcomes for disadvantaged populations. With greater knowledge of each patient's challenges, risks, and motivations, providers can more easily address barriers to care and support the best possible outcomes for each and every patient.

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In her 20+ years of clinical experience, working with thousands of patients across multiple practice settings, Ms. Spira developed a deep understanding of patients' challenges with recovery from injury and surgery. Ms. Spira founded Force Therapeutics in 2010 to help patients and providers connect digitally to speed patients recovery to superior outcomes and a positive patient experience. Her focus has always been to empower patients to be educated and successful with their own care. She built FORCE Therapeutics to deliver on this mission through a robust digital health platform that hosts personalized digital care plans including instructional/educational video content, outcomes collection and remote patient monitoring. Ms. Spira is considered a mobile health care expert and a leader in creating and delivering prescriptive care plans via digital health. Ms. Spira is originally from South Africa and now lives in Connecticut with her husband and two children.

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Conflicts of Interest Statement for Ms. Spira

## INTRODUCTION

Health and healthcare disparities occur across a range of dimensions—including socioeconomic status, age, geographical location, language, and gender—and are reflected in variable rates of disease, disability, and death, as well as life expectancy.

Members of disadvantaged groups are more likely to have poor health status in addition to more limited means and ability to access healthcare services. Detailed definitions of these disparities are as follows:

1. **Health disparities** can be defined as preventable differences in the burden of disease, injury, or violence which are experienced by socially, economically, or environmentally disadvantaged populations.
2. **Healthcare disparities** refer to population-level differences in the availability of accessible healthcare services, the use and quality of those services, and the ability to pay for those services.
3. **Health equity** refers to the elimination of health and healthcare disparities to achieve a state in which all individuals have equal opportunities to attain their full health potential.

Three of the primary social determinants of health that impact healthcare accessibility are income, geographic location, and limited medical transportation (Heath, n.d.). Even before the COVID-19 pandemic, The Commonwealth Fund found that 50% of low-income adults (Doty et al. 2021) in the U.S. skipped a medical visit, test, treatment, or prescription within the past year due to its cost. In fact, income-related healthcare disparities are higher in the U.S. than in any other developed nation.

Within orthopedic care, existing literature has long identified various health and healthcare disparities, including significantly lower rates of total hip arthroplasty (THA) and total knee arthroplasty (TKA) among Black (McBean and Gornick 1994) and Hispanic (Escalante et al. 2002) patients, as well as higher amputation rates among Black (Leggetter et al. 2002) and Mexican American (Lavery et al. 2003) diabetic patients. While such studies have for decades identified the presence and impact of healthcare disparities among minority and disadvantaged populations, action to improve health equity in orthopedics has been scarce.

## LEGISLATIVE DEVELOPMENTS

Nonetheless, the national conversation on improving health equity is gathering momentum, accelerated in part by the COVID-19 pandemic, which had an outsized impact on racial and ethnic minority groups (Hill and Artiga 2022) and rural populations (Marema 2022) and brought to fore the full extent of our nation's healthcare disparities.

In spring 2022, the Centers for Medicare & Medicaid Services published a Framework for Health Equity (U.S. Centers for Medicare & Medicaid Services 2022a) to guide its next decade of policy-making, and subsequently issued a proposed payment rule for inpatient and long-term care hospitals which includes three health equity-focused measures (U.S. Centers for Medicare & Medicaid Services 2022b). The first assesses a hospital's commitment to delivering more equitable healthcare, while the remaining measures ensure that hospitals are screening patients for social determinants of health, such as food insecurity and housing instability.

As healthcare stakeholders prepare for coming legislation and seek out means of improving health equity, they will need to identify processes and digital tools to help reduce barriers to care in the communities they serve. In the field of orthopedics, eliminating healthcare disparities requires careful consideration of how an orthopedic practice engages with patients from disadvantaged populations, and an intentional decision to prioritize health equity by instituting progressive policies and adopting digital healthcare tools that can eliminate barriers to care.

## RECOGNIZING THE SCOPE OF HEALTHCARE DISPARITIES IN ORTHOPEDICS

### LOWER UTILIZATION AND REFERRALS, HIGHER READMISSION AND COMPLICATION RATES

In orthopedics, disparities in care manifest primarily as lower utilization rates among minority and lower-income populations. Although the prevalence of knee and hip osteoarthritis does not vary greatly by race or ethnicity, the data shows that Black patients are more than 30% less likely to receive a total hip or knee replacement (Katz 2020) than white patients, even after adjustments are made for age, sex, and income (Medicaid-eligible vs. Medicaid-ineligible patients).

Independent of race, lower-income populations are also far less likely to have orthopedic surgery, due in part to healthcare accessibility challenges. Patients with state-funded Medicaid and federally funded Medicare plans encounter numerous barriers to securing musculoskeletal care, including lower referral rates to orthopedic surgeons. A survey of Medicaid and Medicare acceptance rates found that less than 50% of orthopedic surgery practices accepted Medicaid insurance (Hawkins 2017); in five metropolitan markets, acceptance rates were 25% or less.

Dr. Richard Iorio, an orthopedic surgeon at Brigham and Women's Hospital, highlights the role technology can play in advancing health equity when he says, *"Access to care is limited by many factors, including insurance coverage, payment paradigms, healthcare awareness, and provider accessibility. Technology in general can provide the digital bridge to healthcare access and can help break down the barriers of implicit and explicit bias by standardizing the delivery of the appropriate intervention for each individual patient. We need healthcare providers and patients to make use of these tools in a more universal fashion."*

Disadvantaged populations also experience increased complication and readmission rates. After total knee replacement, racial and ethnic minority groups are at a higher risk for early complications (Nwachukwu et al. 2010) within the first 90 days. Minority ethnic groups have higher failure rates than white patients after initial total joint arthroplasty, but are less likely to have revision surgery; Black and Hispanic patients who do complete a revision arthroplasty are at a significantly higher risk for postoperative infection (Klemt et al. 2021) and inferior postoperative outcomes.

## POOR COMMUNICATION AND ENGAGEMENT

Several studies have found that Black patients experienced poorer communication quality and more limited participatory decision-making (Shen et al. 2018) in comparison to white patients.

A randomized clinical trial (Ibrahim et al. 2017) conducted in Philadelphia, PA showed that eligible Black patients with end-stage osteoarthritis were 70% more likely to receive a total knee replacement than a control group after watching a 40-minute video that explained the risks, benefits, and alternatives to surgery. The study suggests that clinicians were not effectively communicating the availability of total knee replacement to their Black patients.

## DIGITAL ACCESS CHALLENGES

In many rural and low-income communities across the nation, an inadequate broadband infrastructure hinders the use of virtual care and telehealth solutions.

More than one-third of rural Americans (Bailey, n.d.) report that the lack of high-speed internet and/or access to a computer are obstacles to their use of telehealth services, and 43% of lower-income adults do not have broadband services at home (Vogels 2021). According to the Pew Research Center, 27% of American adults living in households earning less than $30,000 a year are smartphone-only internet users (Vogels 2021), a percentage which has more than doubled since 2013.

## TECHNOLOGICAL AND HEALTH LITERACY

For decades, the popular wisdom has held that seniors are far less likely to adopt or engage in new technology, despite the fact that older individuals are more likely to use EHR portal technologies than younger individuals (Tavares and Oliveira 2016). In 2019, a Rock Health survey found that only 20% of adults 65 and older (Hans, Stotz, and Zweig 2020) had ever used a healthcare app, as compared to almost 60% of those under age 55. Without thoughtful design

and accessibility features, this can lead to limited engagement in telehealth services among seniors.

In addition, more than one-third of Americans (36%) have low health literacy (Vernon et al., n.d.), which the Health Resources & Services Administration defines as "the degree to which individuals can obtain, process, and understand the basic health information and services they need to make appropriate health decisions." Older age, minority membership, and low socioeconomic status are disproportionately correlated with poor functional health literacy in both urban and rural populations.

### LANGUAGE BARRIERS

In addition to health literacy, a lack of fluency in English can substantially impact both the quality and accessibility of care. More than 13% of the American population speaks Spanish at home, and 8% of the population has limited proficiency in English (Wooldridge 2021).

A multi-year study on healthcare utilization among Hispanic adults found that limited English proficiency functions as a major barrier to care (Himmelstein et al. 2021), resulting in the underuse of medical services.

### THE CONSEQUENCES OF DELAYED OR MISSED CARE

For many patients living with daily pain, the cost of delaying or not having surgery can be tremendous. Disparities in medical access can lead to significant functional impairment for those living with a chronic condition. In one national study of more than 7,000 individuals with arthritis, the incidence rates of developing disabilities in Activities of Daily Living (ADL) (Song et al. 2007) over a six-year period was significantly higher for Blacks (28%) and Spanish-speaking Hispanics (28.5%) as compared to whites (16.2%), even though the prevalence of knee and hip osteoarthritis does not vary greatly by race or ethnicity.

An untreated musculoskeletal condition can also result in sedentary behavior that leads to or worsens co-morbidities, including diabetes, obesity, depression, and opioid misuse. In addition to negatively impacting patients' lives and well-being, insufficient access to orthopedic surgery also presents a cost burden to the overall healthcare system.

*Bronwyn Spira, founder and CEO of the VPT platform explains that "We must work together to address the issue of insufficient orthopedic access for socioeconomically disadvantaged populations. While standardized care paths and digital tools can bring us part of the way to health equity, we must also consciously address social factors that impact outcomes, including patients' native language, education level, income, and home support systems. By designing systems and processes that extend patient access across diverse communities, we can make great strides in ensuring that no patient suffers needlessly from untreated musculoskeletal issues."*

## ADVANCING HEALTH EQUITY IN ORTHOPEDICS

### USING VIRTUAL TOOLS TO EXPAND ACCESS TO ORTHOPEDIC CARE

Health equity begins with improving patients' access to care. New federal legislation and evolving reimbursement policies, particularly incentives to provide accessible digital care management tools, have the potential to remove barriers to care for lower-income patients.

Implementing remote care management, monitoring, and messaging tools can eliminate the need for patients to attend in-person appointments, saving patients considerable time and expense. In-person preoperative appointments can be replaced with virtual education classes, while the option of virtual physical therapy (PT) can supplement or in some instances replace traditional outpatient PT, saving patients co-pays and transportation costs.

Offering clinically validated remote education and therapy to patients in the comfort of their own homes can improve access to specific, relevant information for vulnerable populations, including:

- Patients in rural communities, who live far away from brick-and-mortar care facilities
- Patients who cannot afford copays for doctor or outpatient PT appointments
- Patients in urban communities, who may have mobility issues, such as crutches or walkers, that make leaving their home difficult or impossible
- Patients who lack transportation to medical appointments
- Patients who cannot schedule in-person appointments due to an inability to take time off work or secure childcare
- Patients who need to avoid potential COVID-19 exposure due to their health status
- Patients who speak English as a second language
- Patients impacted by natural and environmental factors, such as inclement weather

Northside Hospital System conducted a study to determine if formal physical therapy was necessary for those undergoing outpatient total knee arthroplasties (McGrath et al. 2022). Patients were assigned to either outpatient physical therapy (OPT), or a virtual physical therapy program (VPT).

Results showed that not only did VPT patients experience equivalent outcomes at in-person functional assessments 6 weeks postoperatively, but they also achieved equivalent scores for the VR-12 (both physical and mental component scores), KOOS Jr., NRS Pain, and patient satisfaction questionnaires at 6 weeks, 12 weeks and 1 year postoperatively.

VPT patients also were able to save $169.93 as well as approximately 2 hours and 20 minutes in travel time (based on an average of 11.62 OPT sessions) as compared to patients completing a standard course of OPT.

## NURTURING HEALTHCARE ENGAGEMENT IN DISADVANTAGED POPULATIONS

To enable better outcomes for all populations, orthopedic teams must intentionally seek ways to build stronger relationships with their patients, especially members of disadvantaged populations who are likely to need additional support. Through episode-of-care management platforms, implementing standardized protocols for specific care paths and procedures can help practices correct against implicit bias and ensure consistent communication with all patient populations.

Digital tools that enable shared decision-making, patient-centered counseling, and educational intervention may help address disparities in orthopedic surgery utilization. One method of fostering stronger patient/provider relationships is enabling the setting and ongoing monitoring of patient-centered goals, which is one of The Joint Commission's requirements for various orthopedic Disease-Specific Care Certification programs (The Joint Commission 2022).

According to the National Committee for Quality Assurance, patients who are engaged in the goal-setting process (The National Committee for Quality Assurance 2018) and invested in the outcomes are more likely to adhere to their plan of care and treatment. Remote care management tools can help orthopedic practices track established patient goals, engage in shared decision-making, and follow-up with patients throughout their recovery, leading to better outcomes for disadvantaged patients.

Dr. Kevin McGuire, an orthopedic surgeon at Dartmouth Health, emphasizes this point when he says, "Goal-setting helps our physicians see patients as individuals. If I talk to my patient about why taking a walk with their grandchild is an important milestone for them, that knowledge motivates me as well as the patient. When we understand the patient's preferences, values, and aspirations—and can see their progress toward their goal—we are better equipped to help them achieve the best possible outcomes."

## ENABLING TARGETED INTERVENTIONS TO IMPROVE OUTCOMES

Remote care management tools can also help orthopedic practices identify disadvantaged and high-risk patients—as determined by patients' social determinants of health data, as well as their responses to the standardized Risk Assessment and Prediction Tool (RAPT) form—and actively monitor their progress to ensure equitable care.

Active remote monitoring helps practices determine when to provide targeted in-person intervention, as the steady influx of outcomes reporting and patient progression data reveals which patients are struggling with their recovery. Direct physician/patient messaging tools can also help to reduce unnecessary postoperative ER or urgent care visits. Establishing an open line of communication has been proven to prevent patients with a low degree of health literacy, who are unlikely to research their symptoms online, from heading immediately to the ER with a non-emergent issue.

A retrospective review of readmission data (Force Therapeutics 2021) before and after the implementation of the VPT platform at the Community Hospital of the Monterey Peninsula revealed a 26.3% decrease in readmissions across a variety of musculoskeletal procedures. Total hip arthroplasty patients who were highly engaged with the VPT platform were 40% to 76% less likely to be readmitted within 90 days of their procedure.

## COMBATTING DIGITAL ACCESS DISPARITIES

The technological infrastructure of any care management or remote monitoring platform must support all patient populations, particularly those with digital access challenges.

Many platforms and applications intentionally compensate for the digital divide in their system design, using architecture that allows users to watch videos without streaming them, for example. System design must also be mobile-friendly, as disadvantaged populations are less likely to own a tablet, laptop, or desktop computer.

An example of a health system with patients who could benefit from telehealth solutions is Geisinger Health System, whose knee and hip surgery patients live in predominantly rural areas, some two hours or more from their anchor hospital. Geisinger found a strong correlation between its patients' geographic location and their digital use, as patients who live 15 km or more from their anchor hospital have higher levels of engagement with the VPT platform than patients who live closer, including a significantly higher number of logins, hourly sessions spent on the platform, and postoperative video views (Kim and Suk 2019).

Short message service (SMS)-enabled platforms, which allow patients to opt into receiving and sending texts, can be a smart alternative to web-based technology. Research shows that two-way interactive text messaging between patients and clinicians can be a successful health intervention tool (Marko-Holguin et al. 2019), as it engages patients with complex healthcare needs and is user-friendly for clinical staff. Compared with other means of communication, text messaging has the highest reach with open rates of 95% or above and response rates more than 200% higher than for email (Weiner 2021).

## EXPANDING PATIENTS' TECHNOLOGICAL COMFORT ZONE

Digital care management tools must also be user-friendly and accessible for patients with varying degrees of technological literacy.

Since the start of the pandemic, telemedicine use increased 340% (Landi 2020) among Medicare-eligible seniors, and nearly one-third of those 64 and older use a wearable health monitoring device. For remote care monitoring and management tools, research indicates that simple user interface design and accessibility features—such as larger text size, bold fonts, fewer buttons, and speech-activated tools—are essential for usability.

Bronwyn Spira, founder and CEO of the VPT platform, explains that superusers are most frequently between the

ages of 51 and 80. She says, "As the research shows, a user's online habits, self-perception, and need are key to digital tech adoption. When development is guided by the principles of behavioral design and the digital tool delivers real value to the user's life, it is not difficult to encourage adoption and sustain engagement".

### RESPECTING HEALTH LITERACY AND LANGUAGE NEEDS

To be effective, the content provided by a remote care management application must respect patients' health literacy and satisfy their communication preferences. The National Institutes of Health recommends that healthcare-specific materials be written no higher than a sixth to seventh grade reading level (National Institute of Health, n.d.), with supportive visual aids to ensure the meaning is clear.

Any remote monitoring or digital care management tool should be available in Spanish, as well as other common native languages whenever possible.

According to Surgical Care Affiliates Total Joint Nurse Navigator Stephanie Velekie, the significance of such offerings cannot be overstated: "We serve a large Hispanic population, and for years we've had various workarounds for those who are non-native English speakers. Since we've been able to provide our Spanish-speaking patients with educational content, care instructions, and virtual therapy sessions in Spanish, the difference has been profound. When patients fully understand what we're asking them to do throughout their course of care, outcomes improve along with physician/patient relationships. While so many means of broadening patient access depend upon larger initiatives, like changing policies or reimbursement agreements, empowering Spanish speakers to achieve their best outcomes is now within our reach. To my mind, it's one of the easiest ways to support greater health equity."

## ENSURING GREATER HEALTH EQUITY FOR ALL

To make meaningful progress on health equity, health systems and ASCs will first need to identify existing barriers to care that impact their own patient populations. New legislation will require organizations to document how they screen patients for social determinants of health, analyze patient data, and address healthcare disparities.

As orthopedic care can potentially improve the health and well-being of so many Americans, it is crucial that we commit to resolving disparities in orthopedic care access, utilization, and outcomes for disadvantaged populations. Digital care management, remote monitoring, and messaging platforms can help health systems and ASCs improve the quality, consistency, and availability of the care they deliver.

When selecting patient-facing digital tools, health systems should evaluate platforms on their ability to engage all patient populations. A well-designed digital application should be accessible to all individuals, regardless of their location, socioeconomic status, native language, or internet connectivity. Remote monitoring tools that encourage shared decision-making and goal-centered engagement in the recovery process can counterbalance the health disparities experienced by socially and economically disadvantaged populations.

With greater knowledge of each patient's challenges, risks, and motivations, providers can more easily address barriers to care and support the best possible outcomes for each and every patient.

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