New Horizons -Addressing Healthcare Disparities in Endocrine Disease:

Bias, Science, and Patient Care

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Abstract

Unacceptable healthcare disparities in endocrine disease have persisted for decades, and 2021 presents a difficult evolving environment. The COVID-19 pandemic has highlighted the gross structural inequities that drive health disparities, and anti-racism demonstrations remind us that the struggle for human rights continues. Increased public awareness and discussion of disparities present an urgent opportunity to advance health equity. However, it is more complicated to change the behavior of individuals and reform systems because societies are polarized into different factions that increasingly believe, accept, and live different realities.

Key words: equity, disparities, quality of care, outcomes, endocrinology

To reduce health disparities, clinicians must: 1) Truly commit to advancing health equity and intentionally act to reduce health disparities; 2) Create a culture of equity by looking inwards for personal bias and outwards for the systemic biases built into their everyday work processes; 3) Implement practical individual, organizational, and community interventions that address the root causes of the disparities; 4) Consider their roles in addressing social determinants of health and influencing health care payment policy to advance health equity.

To care for diverse populations in 2021, clinicians must have self-insight and true understanding of heterogeneous patients, knowledge of evidence-based interventions, ability to adapt messaging and approaches, and facility with systems change and advocacy. Advancing health equity requires both science and art; evidence-based roadmaps and stories that guide the journey to better outcomes, judgment that informs how to change the behavior of patients, providers, communities, organizations, and policymakers, and passion and a moral mission to serve humanity.

Rashomon (1950)[1]

Priest*: If men don't trust each other, this earth might as well be hell.*

Commoner*: Right. The world's a kind of hell.*

Priest*: No! I don't want to believe that!*

Unacceptable health disparities in care and outcomes have persisted across factors such as race/ethnicity, socioeconomic status, sexual orientation/gender identity, and geographic location, and 2021 presents an evolving environment with difficult challenges and new opportunities. In 2012 the Endocrine Society published a detailed health disparities scientific review in *The Journal of Clinical Endocrinology and Metabolism*.[2] The review documented population differences in prevalence and outcomes of common endocrine conditions and

concluded: “Compared to non-Hispanic whites, non-Hispanic blacks have worse outcomes and higher mortality from certain disorders....“ The review recommended “basic science, population-based, translational and health services studies to explore underlying mechanisms contributing to endocrine health disparities.”

Since the 2012 review, several frameworks and roadmaps have outlined how to reduce health disparities based upon the substantial evidence base about effective interventions.[3-8] A comprehensive, holistic approach is critical for addressing disparities in disease prevalence, quality of care, and outcomes. As exemplified by diabetes, one of the model diseases for understanding health inequities, reducing health disparities requires addressing health issues and underlying social drivers of health such as food insecurity, safe neighborhoods for walking and physical activity, stable housing, and living wages.[9] In its definition of health equity, the World Health Organization (WHO) emphasizes providing access to high-quality care and addressing social drivers of health within a human rights and social justice lens: “*Equity* is the absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, or geographically. *Health inequities* therefore involve more than inequality with respect to health determinants, access to the resources needed to improve and maintain health or health outcomes. They also entail a failure to avoid or overcome inequalities that infringe on fairness and human rights norms.”[10]

In light of these ideals, 2020 was challenging. COVID-19, systemic racism,[11] and political discord have exhausted many people. I was recently on a video call with rural clinicians my team collaborates with to improve diabetes care and outcomes. They were concerned with the surge of COVID-19 cases in their area, and even more disheartened with the resistance of many of the public to wear masks and social distance in favor of “fighting for freedom.” And

yet, hope is present with vaccines being distributed for COVID-19, tens of millions of people denouncing racism, and many at the ballot box yearning for civility and communal spirit.

In this New Horizons paper, I take the perspective of the typical clinician who is motivated to provide the best care to all their patients and is asking themselves what should I do to reduce health disparities in today's environment. I take a realistic view of the practical challenges clinicians face and what is required for them to succeed in today's world. I will discuss what we can do as individual clinicians taking care of our patients, as members of health care organizations delivering a system of care, and as persons in society. It is critical not to be locked into the past nor to bring a switchblade to a gun fight. We can build upon a strong foundation of clinical skills and surround them with complementary capabilities to most effectively reduce health disparities. Advancing health equity requires both science and art; evidence-based roadmaps and stories that guide the journey to better outcomes, judgment that informs how to change the behavior of patients, providers, communities, organizations, and policymakers, and passion and a moral mission to serve humanity.

Great art and humanities elucidate the essence of the human experience, and thus I will share quotes from movies that introduce and highlight key issues clinicians face in reducing health disparities.[12] Like many over the past year, my family has streamed movies at home as we limit outside activities because of the COVID-19 pandemic. Both niche art films and movies geared for mass general audiences have captured human epiphanies and appealed to our heads and hearts.

Total Recall (1990)[13]

Lori Quaid: *No wonder you're having nightmares. You're always watching the news.*

Rashomon (1950)[1]

Commoner*: But is there anyone who's really good? Maybe goodness is just make-believe.*

Priest*: What a frightening…*

Commoner*: Man just wants to forget the bad stuff, and believe in the made-up good stuff. It's easier that way.*

We live in difficult, contentious times

Worldwide 2020 was a difficult year, with many people in need of a cathartic scream as depicted in the iconic painting by Edvard Munch or Arnold Schwarzenegger as Douglas Quaid waking up from a nightmare suffocating to death on Mars in *Total Recall*.[14] The COVID-19 pandemic has highlighted the gross structural inequities that drive health disparities,[15] and anti-racism demonstrations remind us that the struggle for human rights continues. COVID-19 has disproportionately harmed Black, Indigenous, and People of Color (BIPOC) and poor people, reflecting higher baseline comorbidity from diseases caused by health disparities, worse access to high-quality care, and higher exposure to COVID-19 from jobs as essential workers and crowded housing.[16] Increased awareness and public discussion of systemic racism has been spurred by police brutality against BIPOC and the Black Lives Matter movement.[17] The societal call to action to address inequities is high because of COVID-19 and the movements against systemic racism.[18]

However, impeding this call to address inequities is the heightened polarization of society over the past 40 years. BIPOC have frequently had their trust violated by the medical and scientific establishment because of egregious ethical abuses such as the Tuskegee Experiment and contemporary racist actions and policies that perpetuate inequities,[19-21] and the persistence of the anti-vaccination movement shows how the arguments of traditional science have not been compelling to some.[22] Resistance to scientific evidence is important because it impedes behavioral change and health promotion in individuals and encourages opposition to public health and health care policies grounded in objective facts.

In the United States, much of the public has resisted evidence-based public health measures to contain COVID such as wearing masks and social distancing.[23] A key underlying driver of this rejection of science, facts, and evidence is politicians manipulating the public to expand their power. Thus, clinicians and scientists working to reduce health disparities are confronted with two competing megatrends: increased public awareness and discussion of disparities present an urgent opportunity to advance health equity. However, persons in polarized societies increasingly believe, accept, and live different realities, spurred by politicians and media outlets seeking to expand their power and influence.

***Trouble With the Curve (2012)*[24]**

***Gus Lobel**: Anybody who uses computers doesn't know a damn thing about this game [baseball].*

Clinicians must integrate science, judgment, and leadership to advance health equity

In *Trouble With the Curve*, Clint Eastwood starred as curmudgeonly baseball scout Gus Lobel who complained that new age scouts over-relied on advanced statistical data analytics rather than their judgment to assess prospective major league players. Traditionally clinicians have been taught: Apply the principles of evidence-based, patient-centered care to all, and

your patients will do fine. Clinicians have also generally been told to stick to the scientific evidence and do not get involved in politics. For example, Dr. Anthony Fauci, Director of the National Institute of Allergy and Infectious Diseases, believes he has survived seven Republican and Democratic Presidential administrations partly because he is grounded in scientific evidence. In 2018, a debate erupted in the United States when the American College of Physicians advocated for gun control legislation.[25] The National Rifle Association tweeted: "Someone should tell self-important anti-gun doctors to stay in their lane."[26] Physicians pushed back hard stating that gun control policy was their lane (Twitter hashtag #ThisIsMyLane) given that guns led to trauma they had seen in their emergency departments. *Annals of Internal Medicine* editor Dr. Christine Laine stated: "*Annals of Internal Medicine* is not anti-gun; we are anti-bullet holes in people….And if we are biased, the bias is toward counseling our patients to reduce their risk of firearm injury and toward evidence-based solutions to the public health crisis that firearm injury has become."[27]

Statements that objective decisions can be divorced from value judgments and that science can be separated from politics have appeared in other complex fields. For example, U.S. Chief Justice of the Supreme Court John Roberts famously said at his confirmation hearings that his job was to "call balls and strikes" rather than insert his political views into legal deliberations, as if a robotic camera calling balls and strikes in a baseball game could be used to interpret the law.[28]

The days of only calling balls and strikes are over for clinicians, and probably never actually existed. Models of the clinician-patient relationship and shared decision making have covered a spectrum of styles ranging from the paternalistic "clinician knows best" model to the clinician as automaton merely spitting out facts and letting the patient decide the treatment.[29] The reality is that most clinician-patient interactions incorporate shared decision

making with mutual give and take, and it is rare for clinicians to be truly unbiased and in equipoise when providing information. Clinicians often frame information in ways they think will lead the patient to choose the clinician's preferred option for the patient. Similarly, the idea of calling balls and strikes for a topic as complicated as health equity is a fallacy to begin with. Expecting objective scientific information alone ("staying in your lane") to change behavior of patients and organizations is wishful thinking, and in fact implicit biases by clinicians and health care administrators are a significant driver of health disparities and need to be confronted head on. Caring for diverse populations in 2021 requires knowledge of evidence, self-insight and true understanding of heterogeneous patients, ability to adapt messaging and approaches, and facility with systems change and advocacy.

A Clockwork Orange (1971)[30]

Alex DeLarge: *You needn't take it any further, sir. You've proved to me that all this ultraviolence and killing is wrong, wrong, and terribly wrong. I've learned me lesson, sir. I've seen now what I've never seen before. I'm cured! Praise god!*

Dr. Brodsky: *You're not cured yet, boy.*

Now is the time to address health disparities, but no easy solution exists

2020 jolted the world, and many clinicians are more motivated than ever to advance health equity. However, no quick solution or magic bullet cure exists. In Stanley Kubrick's *A Clockwork Orange*, incarcerated gangster Alex DeLarge opted for experimental aversion therapy to cure him of his violence so he would qualify for early discharge from prison in two weeks. Dr. Brodsky informed Alex that his early nauseated reactions to violent images was just the start on his road to recovery. Similarly, clinicians are likely to experience more discomfort addressing structural inequities and

racism before they feel better advancing health equity if they have honest discussions around racism.[31] Clinicians working to advance health equity must simultaneously work in multiple areas:[32] 1) Truly committing to advancing health equity and intentionally acting to reduce health disparities; 2) Creating a culture of equity by looking inwards for bias and outwards for the systemic biases built into their everyday work processes; 3) Implementing practical interventions to reduce disparities; 4) Considering their roles in addressing social determinants of health and influencing health care payment policy to advance health equity.

A key insight for advancing health equity reflected in the World Health Organization definition is that research must study both health and social factors impacting care, and address both individual and structural drivers of health.[10,33] For example, from a medical perspective, individual clinicians can prescribe the appropriate medications to control glucose, blood pressure, and lipids for patients with diabetes. Clinicians can also help create systems of team care that provide patients counseling and assistance with lifestyle change around diet and physical activity, and close longitudinal follow-up and monitoring otherwise impossible during a few 15-minute appointments throughout the year with the primary care provider. Similarly on the social determinants side, clinicians can screen a patient with diabetes for food insecurity to help that individual patient, and health care organizations can partner with community organizations to address the structural problem of food deserts to help a community reduce their diabetes disparities. The National Institute on Minority Health and Health Disparities Research Framework indicates that research must span Levels of Influence (Individual, Interpersonal, Community, Societal) and Domains of Influence (Biological, Behavioral, Physical/Built Environment, Sociocultural Environment, Health Care System) to reduce health disparities.[7] In 2021, the American Diabetes Association published a detailed scientific review in *Diabetes Care* of how social determinants of health impact diabetes outcomes and what interventions can reduce health disparities.[34]

Silence of the Lambs (1991)[35]

Dr. Hannibal Lecter: *You know what you look like to me, with your good bag and your cheap shoes? You look like a rube. A well scrubbed, hustling rube with a little taste. Good nutrition's given you some length of bone, but you're not more than one generation from poor white trash, are you, Agent Starling? And that accent you've tried so desperately to shed: pure West Virginia. What is your father, dear? Is he a coal miner? Does he stink of the lamp?…..*

Clarice Starling: *You see a lot, Doctor. But are you strong enough to point that high-powered perception at yourself? What about it? Why don't you - why don't you look at yourself and write down what you see? Or maybe you're afraid to.*

Look in the mirror and take the hard look inwards

It is not threatening to clinicians to look outwards and identify patient characteristics such as limited ability to understand health information and cultural beliefs as causes of health disparities. It is much more troubling to look in the mirror and clearly see our own implicit biases as root causes of disparities,[5,36] and acknowledge structural biases in how we organize and deliver care in our clinics and hospitals,[37] and allocate research funding and prioritize journal topics. If the racial/ethnic demographic profiles of persons with type 1 diabetes and sickle cell anemia were flipped, would the relative amounts of research funding for each remain unchanged?[38] Why is our investment in and insurance coverage of new medications much more generous than interventions that address social factors impacting care?

The corollary of not recognizing our implicit biases is not fully understanding the lived experiences of others. I am currently completing a project that aims to improve shared decision making between clinicians and lesbian, gay, bisexual, transgender, and queer (LGBTQ) people of color across multiple conditions including diabetes.[32] Analyzing the interviews and stories of over 200 persons, I realized

that I previously had limited knowledge of their complex intersectional challenges.[39] For example, too often transgender people of color face transphobia in heterosexual communities and racism in LGBTQ communities.[40] I similarly had only a basic understanding of the harsh effects of colonialism until I collaborated with Māori colleagues on a project comparing the approaches to health equity of Aotearoa/New Zealand and the United States.[41] While many of us are concerned and troubled by the COVID-19 pandemic, police brutality against BIPOC, and systemic racism, many of my African American and Latinx friends and colleagues are utterly exhausted, basically reliving trauma on a daily basis as racist examples come to light and are discussed in the media and routine conversations.[42,43] Thus, both our implicit biases and the limits of our own experiences impede our ability to work most effectively with diverse patients and understand the structural issues that drive health disparities.

Table 1 describes core knowledge, insights, and skills for advancing health equity that enable us to address personal implicit biases and systemic structural biases.[44] Active experiential training is critical for learners to safely assess their own personal beliefs and biases and understand the lived experiences of others. It is also important to recognize the bidirectional biases between clinician and patient, and gain self-insight into how others perceive you. Training should use mostly discussion, experiential exercises, and self-reflection rather than passive lecturing. A less explored area is how to identify and eliminate the structural biases built into our daily operating systems. I have previously described how systematic biases were unintentionally built into the way University of Chicago Medicine developed predictive machine learning algorithms to decrease hospital length of stay and how these biases were subsequently remedied.[45,46] Checks for biases should be standard operating procedure in the development, implementation, and monitoring of care delivery systems. Leadership requires honesty, truth telling, courage, vulnerability, boldness, and accountability.

Gallipoli (1981)[47]

Colonel Robinson*: Your orders are to attack and you'll do so immediately. The British at Suvla must be allowed to get ashore. Is that clear? You are to push on.*

Major Barton*: It's cold blooded murder.*

Colonel Robinson*: I said push on.*

Major Barton*: Yes sir.*

Do not repeat what has not worked. Intentionally design interventions to reduce health disparities.

The classic Australian movie *Gallipoli* starring a very young Mel Gibson, as well as a 2015 mini-series of the same title,[48] depicts Australia's ill-fated military engagement of Turkey at the Gallipoli Peninsula during World War I. The British General Ian Hamilton committed the folly of trying the same failed battle strategy again and again, at the cost of thousands of Australian soldiers' lives. The most powerful scene in each film is when four waves of Australian soldiers are sequentially ordered to leave their trenches to attack the Turkish front lines. Each wave is wiped out within 30 seconds of going over the top by machine gun fire, killed by poor strategy and tactics, and underlying hubris. I wonder what it must have been like to be one of the young men ready to go over the top, knowing your death was imminent once the whistle blew. Every system is perfectly set up to get the outcome we see.

The secret sauce of successful disparities interventions is that they are tailored to address the underlying drivers of health disparities in a particular population of patients in their specific context.[3,6,49] General patient centered approaches – "Just treat everyone with the same good care" –

are insufficient. Thus, off-the-shelf interventions might not work without adaptation to context. Too often systems of patient care have not been intentionally designed to reduce health disparities, nor have patients and their communities been meaningfully part of their development, implementation, and evaluation. Thus, perhaps not surprisingly many disparities have persisted. Several systematic reviews have been published of interventions to reduce disparities, including for diabetes.[50-52] Disparities interventions have most commonly focused on changing the patient and have underexamined the health care delivery system and health policy as levers for reform, thus limiting improvement.[53] Table 2 shows major themes of those reviews. Across multiple conditions, successful interventions include multifactorial interventions that address the underlying causes of the disparities, culturally tailored rather than generic interventions, and team-based care often with substantial roles for nurses. Effective interventions employ community health workers, involve families and communities in care plans, and engage patients in interactive experiential education rather than passive didactive teaching.[3,54] Examples of successful interventions for reducing diabetes disparities include chronic care management with team-based care, population health management, quality improvement using performance data stratified by risk factors, culturally tailored patient self-management education, virtual health, health care-community partnerships, and place-based interventions that recognize the importance of the built and social environments. For many endocrinology conditions, few interventions have been tested to reduce health disparities.[2] However, the general quality improvement literature for conditions such as osteoporosis have similarities to that of diabetes,[55] and thus the lessons from interventions to reduce diabetes disparities and the wider disparities intervention literature are likely to apply.

Advancing health equity requires a process of individualization: Identifying disparities in our patient populations and settings, determining the causes of the disparities for our specific contexts, and tailoring solutions to meet these needs in collaboration with patients and communities.[5,56] Menus of evidence-based interventions can be helpful, but must be adapted for our patients and contexts. Science and art are integrated together.

Goodfellas (1990)[57]

Henry Hill: *Whenever we needed money, we'd rob the airport. To us, it was better than Citibank.*

Payment policy heavily influences the organization and delivery of health care. We need to design payment systems to support and incentivize advancing health equity.

Like any other private industry, health care needs to pay for itself to be sustainable. Reducing health disparities may save society money.[58] However, the U.S. payment system, including most current value based payment and alternative payment models,[59,60] does not have a sufficiently compelling business case to reduce disparities from the perspective of the individual clinician, clinic, hospital, and health insurance plan.[61] Thus, not surprisingly inequities persist. Payment systems and broader social policy can be changed to address social determinants of health and advance health equity more effectively (Tables 3 and 4).[60,62-64] Each clinician needs to consider what role they should have in impacting those broader social and payment factors. When I was a medical student, I did my obstetrics-gynecology rotation at a safety net hospital in the Central Valley of California and delivered 20 babies during my six-week assignment.[65] While fun and rewarding, halfway through the rotation I realized that all of the new mothers I had delivered to that point were teenagers who would likely have difficult challenges ahead of them. I suddenly felt like a mechanical tool trying to patch a crack in a dam while a tsunami was about to crash unless the wider social issues surrounding teenage pregnancy were addressed.[66] I did not want to feel like a helpless cog in a machine.[67]

Do the Right Thing (1989)[68]

Da Mayor*: Doctor.*

Mookie*: C'mon, what? What?*

Da Mayor*: Always do the right thing.*

Mookie*: That's it?*

Da Mayor*: That's it.*

Mookie*: I got it. I'm gone.*

All clinicians are advocates, whether for their patients, their communities, or for themselves

Some clinicians feel uncomfortable viewing themselves as advocates. They feel they must remain objective, politically nonpartisan, and based in science. The reality is all clinicians are advocates, and in fact the Accreditation Council for Graduate Medical Education requires residency programs to teach trainees skills in "advocating for quality patient care and optimal patient care systems."[69] Advocacy exists along a spectrum with a comfortable landing spot for everyone (Table 5).[70-73] I have yet to meet a clinician who did not think it was their professional and moral responsibility to advocate for their patients. Beyond individual patient care, clinicians can help transform their clinics and hospital systems to provide more equitable care.[3,54] Clinicians can also encourage their health care organizations to become anchor institutions that treat their employees right with fair wages and benefits and expand economic opportunity in their communities by using local vendors.[74,75] Clinicians should also understand the basics of health care policy and decide if it feels right to them to advocate for reforms that advance health equity, whether as citizens, members of professional societies, or as clinicians who can influence their employer's advocacy efforts.[70,76-78] Clinicians can advocate for public policy reform to align payment with advancing health equity and addressing social determinants of health. They can educate the public about reducing disparities through talks and writing. They can support calls for social justice and human rights, and create constructive tension as advocated by Dr. Martin Luther King, Jr., to further the dialogue about anti-racism.[76] In

2021, the U.S. National Academies of Sciences, Engineering, and Medicine will publish a consensus report *The Future of Nursing 2020-2030: Charting a Path to Achieve Health Equity* that identifies equity and social factors as the key issues of the decade. The report will call for health care organizations, payers, and policymakers to support nurses in their fundamental roles caring for patients, addressing social determinants of health, and advancing health equity.[59]

Do the Right Thing (1989)[79]

Radio Raheem*: Let me tell you the story of Right Hand, Left Hand. It's a tale of good and evil. Hate: it was with this hand that Cane iced his brother. Love: these five fingers, they go straight to the soul of man. The right hand: the hand of love.*

Advancing health equity is an inspiring moral imperative connected with professional values. Progress is dependent upon the good in our patients, the public, and ourselves.

When I see my patients in my general internal medicine clinic, I often have a third-year medical student with me. When I orient the student to the outpatient rotation on day 1, I explain that clinical medicine is storytelling. It is critical to listen to the patient's story to get information and make diagnoses, and resist the temptation to immediately turn on the close-ended directed medical script. And good care fits health promotion and treatment into the patient's overall life story. University of Chicago medical students are extremely bright, motivated, and socially skilled, yet most students take three or four clinic sessions before they become comfortable communicating effectively with patients and their families. Part of this adjustment period is the stress and challenge of a new rotation, clinical area, and preceptor. However, I think another key barrier is that students' minds are cluttered with medical script, which of course is important but not at the expense of truly understanding the patient, their lived experience, and their world view. I now usually start my new patient visits by saying: "Hi, I'm Dr. Chin. How would you like to be called? I like to hear about my patients' life stories. We'll get to your medical issues in a moment. Please tell me about your life story, starting way back."

Ultimately we must rely on people's moral judgment and communal spirit for progress.[80] If those are gone, we are in deep trouble. As part of their orientation of new employees, St. Mary's and Clearwater Valley Hospital and Clinics in frontier Idaho have their new workers create a personal mission statement which is laminated and placed on a second card that is attached to their employee identification card. Chief Medical Officer Kelly McGrath's card reads:

Passion & Purpose

Health and Harmony

With Compassion, Gratitude,

Integrity and Joy,

I guide myself and others

to treasure the beauty and

goodness in our world,

and to discover and achieve

the unique ways in which

we are called to

make it even better.

Pediatricians discussing childhood vaccination with anti-vaccination parents, and clinicians explaining public health measures to prevent COVID-19 like wearing masks with libertarian patients have discovered that facts alone are insufficient to drive behavioral change.[81] A culture of equity

encompasses understanding the essence of people and communities, communicating effectively with them,[82-84] and possessing the technical skills of caring for diverse patients and building systems of care delivery that can reduce health disparities. I do not have easy solutions for how to bridge the partisan divide in world views and cultures. However, I believe that the public must perceive that policies and interventions are fair and benefit them. And a crucial initial step is effective communication that encompasses intense listening, active engagement, "Yes, and" ways of acknowledging the patient's starting point on the way to an aspirational goal,[85] true respect and curiosity to understand the lived experience, and a belief that the vast majority of people are inherently good and that we must appeal to people's inner moral sense and yearning for justice and human rights.[86] Ultimately such faith is what we have left in our armamentarium of caring for patients, and what inspires us to keep going as healers and humans.

Billy Elliot the Musical Live (2014)[87]

Auditioner Woman*: Can I just ask you, Billy*

What does it feel like when you're dancing?

Billy Elliott*: ….It's like that there's a music playing in your ear*

And I'm listening, and I'm listening and then I disappear

And then I feel a change

Like a fire deep inside

Something bursting me wide open impossible to hide

And suddenly I'm flying, flying like a bird

Like electricity, electricity

Sparks inside of me

And I'm free I'm free.

Data Availability: Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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Table 1. Core Knowledge, Insights, and Skills for Advancing Health Equity

Self-Insight

Implicit bias[88,89]

Unconscious biases affect how we view and treat patients.

Bidirectional biases between clinician and patient[36,85]

Clinicians' biases towards patients and patients' biases towards specific clinicians impact clinician-patient communication and relationships.

Cultural humility[90]

Unending aspiration for awareness and reflection interacting with diverse individuals.

Race and racism[20,21,31,37,91,92]

Racism occurs at multiple levels including: Intrapersonal (stigma and self-hatred from negative societal stereotypes), interpersonal (between people), and structural (systemic inequities built into societal structures).

Communication and Clinical Skills

Active listening[85]

Identifying patient's true concerns and issues. Understanding patient's belief system.

Building relationships[85]

Establishing trusting relationship based on mutual respect.

Patient empowerment[93]

Supporting patient's active participation and control of their care.

Shared decision making[94,95]

Inform patient about medical condition and treatment options. Elicit patient preferences, discuss possibilities, and collaborate with patient to decide on management. Recognize heterogeneous ways patients communicate; for example, disempowered, distrusting patients who are uncomfortable disagreeing verbally with clinicians may express their preferences through nonadherence.

Communicating about disparities with the public, media, and policymakers[82,83]

Trauma-informed care[42]

Many patients, especially those with health disparities, have experienced trauma. Trauma-informed care inquires about trauma and emphasizes principles such as empathy, safety, support, collaboration, and empowerment.

History, Systems of Oppression, and Ethics

Historical perspective[19-21,41]

Today's reality has been shaped by the history of how we got here. Racism and colonialism have devastating longterm cultural and financial effects.

Critical consciousness and systems of oppression[96,97]

Understanding and taking action against systems of oppression.

Intersectionality[39,98]

Combination of intersecting systems of oppression that perpetuate discrimination and disadvantage based on factors such as race, class, sex, and gender identity.

Ethics and distributive justice[99,100]

Understand ethical frameworks for advancing health equity including the socially just allocation of resources.

Roadmaps and Policies

Roadmap to Reduce Disparities[3,54]

Process of reducing disparities through identifying disparities, doing root cause analysis of drivers of those disparities, designing and implementing interventions that address those drivers. The process requires a culture of equity and intentionality in actions to reduce disparities. The Roadmap applies to all health care organizations ranging from individual practices to large systems.

Health policy[41]

Understanding organizational and governmental policies and regulations that impact access, quality, and cost of care, and possible reforms and alternatives.

Understanding policies that impact health[78,101]

Table 2. Care Delivery Interventions to Reduce Disparities

General Principles of Successful Interventions[3,54]

Multifactorial interventions that address the different drivers of disparities

Culturally tailored interventions rather than generic interventions

Team-based care, often with substantial roles for nurses

Community health workers, patient navigators, lay health workers including *promotoras*

Involving families and communities

Interactive, experiential patient education rather than passive didactic teaching

Diabetes Interventions[50,102]

Team-based care, care coordination, care management, interprofessional collaboration[50]

Community health workers, patient navigators, lay health workers including *promotoras*[103]

Population health management[104,105]

Risk stratification by medical and social factors[106]

Tailoring of interventions to risk strata

Outreach to persons who have not sought care

Quality improvement[102,107]

Patient self-management education[108-110]

Virtual health, ehealth, telehealth[111]

mHealth[112,113]

Text messaging[114-116]

Technology[110,117,118]

Electronic medical record-based interventions

Stratified performance data, audit and feedback

Community interventions[119]

Community partnerships[120]

Place-based interventions[121,122]

Examples From Other Endocrine Diseases

Access to thyroid and parathyroid surgery and close follow-up[123-125]

Table 3. Published Reviews and Recommendations

to Address Social Determinants of Health

World Health Organization Definition of Social Determinants of Health:[126] "Non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems." Examples include: income and social protection, education, unemployment and job security, working life conditions, food insecurity, housing, environment, early childhood development, social support and inclusion.

Levels of Action

Individual patients: Screen patients for social needs and refer patients to community resources; Develop feedback loops for information with community partners and coordinate care.

Systems: Partner with community and social service agencies/organizations to address the underlying social factors.

American Diabetes Association Social Determinants of Health Review for Diabetes[34]

Neighborhood and Physical Environment

Housing

Moving to Opportunity: Moving from high-poverty to low-poverty census tract reduces risk of developing Hgb A1c > 6.5% and body mass index $\geq$ 35 kg/m^2.[127]

Increased access to diabetes care.[128]

Built environment

Food regulations improved food and obesity-related outcomes.[129-131]

Improved infrastructure for active transport improved physical activity and obesity-related outcomes.[129-131]

Toxic environmental exposures

Smoke-free legislation reduced diabetes risk.[132]

Food environment[133]

Food bank and pantry (Pre/Post study design: improved Hgb A1c;[134] Randomized controlled trial: improved food security, food stability, fruit and vegetable intake[135])

Supermarket loss worsened Hgb A1c.[136]

Supermarket gain decreased food insecurity[137]

Social Context

Social support improves Hgb A1c, blood pressure, and lipids[138]

Linkages of Health Care and Community to Address Social Determinants of Health[56]

Interventions and evaluations in process (e.g. – Accountable Health Communities)[139,140]

National Academy of Medicine *Integrating Social Care into the Delivery of Health Care: Moving Upstream to Improve the Nation's Health* (2019) report[141]

5 A's – Health Care System Activities that Strengthen Social Care Integration:

Awareness – Identify social risks and assets

Activities focused on individuals

Adjustment – Alter clinical care to address social barriers

Assistance – Connect patients with social care resources

Activities focused on communities

Alignment – Align health care systems with community social care assets

Advocacy – Advocate for policies that address health and social needs

Mechanisms

Care redesign

Workforce

Digital infrastructure

Financing

Research

Table 4. Payment Reform that Supports Care Transformation to Advance Health Equity[59-62,142]

Paying for Care Transformation Infrastructure (See Table 2): Upfront Payments

Global payment / Capitation - Total care paid upfront with aggregate payment as opposed to piecemeal based on services provided

Bundled payment[143] - Episode of care (e.g. – surgical bundle [pre-surgery, surgery, post-surgical follow-up]) paid for with lump sum payment

Per member per month – Health care organizations receive monthly payment based on number of beneficiaries under contract

Accountable care organizations[144] – Providers held accountable for the quality of care and costs of an attributed population

Health and human services integration such as accountable health communities[139,140] - Programs and payment mechanisms designed to integrate medical and social services

Incentivizing Care that Reduces Health Disparities

Performance metrics[4]

Reducing disparities between more and less advantaged populations

Improvement in own performance

Reaching absolute performance standard target level

Population health metrics that incorporate addressing social determinants of health (SDOH)

Process and structural measures that address SDOH (e.g. - team-based care, data infrastructure for SDOH, avoidable hospitalizations)

Paying for Medical and Social Services

Blending medical and social funds[145] - Merge funding from multiple sources into one flexible pool

Braiding medical and social funds[145] - Coordinate funding from multiple sources with each source keeping its own rules

Social impact bonds / Pay-for-success financing[146,147] – Investors provide upfront capital that is paid back when target health and/or social outcomes are achieved

Social determinants as public goods[148] – Payment ("Taxation") based on relative benefits to each entity

Functional Payment Questions[59,62,142]

Which patients and communities are the health care organization responsible for?

What costs are the health care organization accountable for (e.g. primary care, specialty care, hospital care, all care)?

How much money is at risk?

Do quality metrics need to be met to share in financial savings?

How will payment be adjusted for patients' social risk so health care organizations do not have a disincentive to care for more vulnerable populations nor provide them suboptimal care?[106]

Table 5. Suggestions for Advancing Health Equity Advocacy

Advocacy Skills to Develop[70,73]

Public speaking

Writing concisely for lay audiences

Integrating storytelling and quantitative data

Leading

Organizing and mobilizing

Developing and fostering community partnerships

Coalition building[149]

Navigating political systems and communicating with policymakers

Types of Advocacy

Individual patients

- Advocating for patients within the system

Health care organizations

- Improving systems of care
- Identifying and eliminating biases in policies, regulations, and structures

Professional societies

- Guidelines and policy statements

- Coalition work across organizations

Public opinion

- Op eds[150]
- Commentaries
- Blogs[151]
- Lay talks
- Community outreach
- Working with the media[152,153]
- Social media[154,155]

Public policy

- Educating policymakers[156]
  - In-person meetings
  - Written communication – correspondence and fact/recommendation sheets

Medical education

- Teaching trainees about equity issues
  - Didactic lectures
  - Discussions on rounds: case-based and general
  - Role modeling