Call to Action: Physician Leadership in 2020

CSPL
Canadian Society of
Physician Leaders

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Contents

EDITOR'S NOTE

CSPL celebrates the 25th issue of *CJPL*

Johny Van Aerde, MD, PhD

Our team would like to thank all the authors, reviewers, and members of the editorial board for helping CJPL grow over the last six years. We also thank our small and dedicated team who have tried to deliver a quality product with limited tangible resources, but with many intangibles, such as passion and dedication. Our articles are available to be read online or as pdfs for downloading to your personal device, all at **cjpl.ca**.

In our first six years, we've published 1000 pages. We have applied to SCOPUS to be included in an online e-library, a process that takes 12 months without an intervening pandemic. With this 25th issue, *CJPL* is also very happy to welcome its new co-editor-in-chief, Dr. Sharron Spicer, who has already contributed to the journal as both a reviewer and author. In this issue, we cover many aspects of changes caused by the ongoing pandemic and other crises, what we've learned, and how we can grow as physician leaders. It covers many of the cracks in the system that were evident but not addressed. We hope you will enjoy this issue and that it will stimulate you to reflect on what was "normal" and what part of normal is worth returning to in the future.

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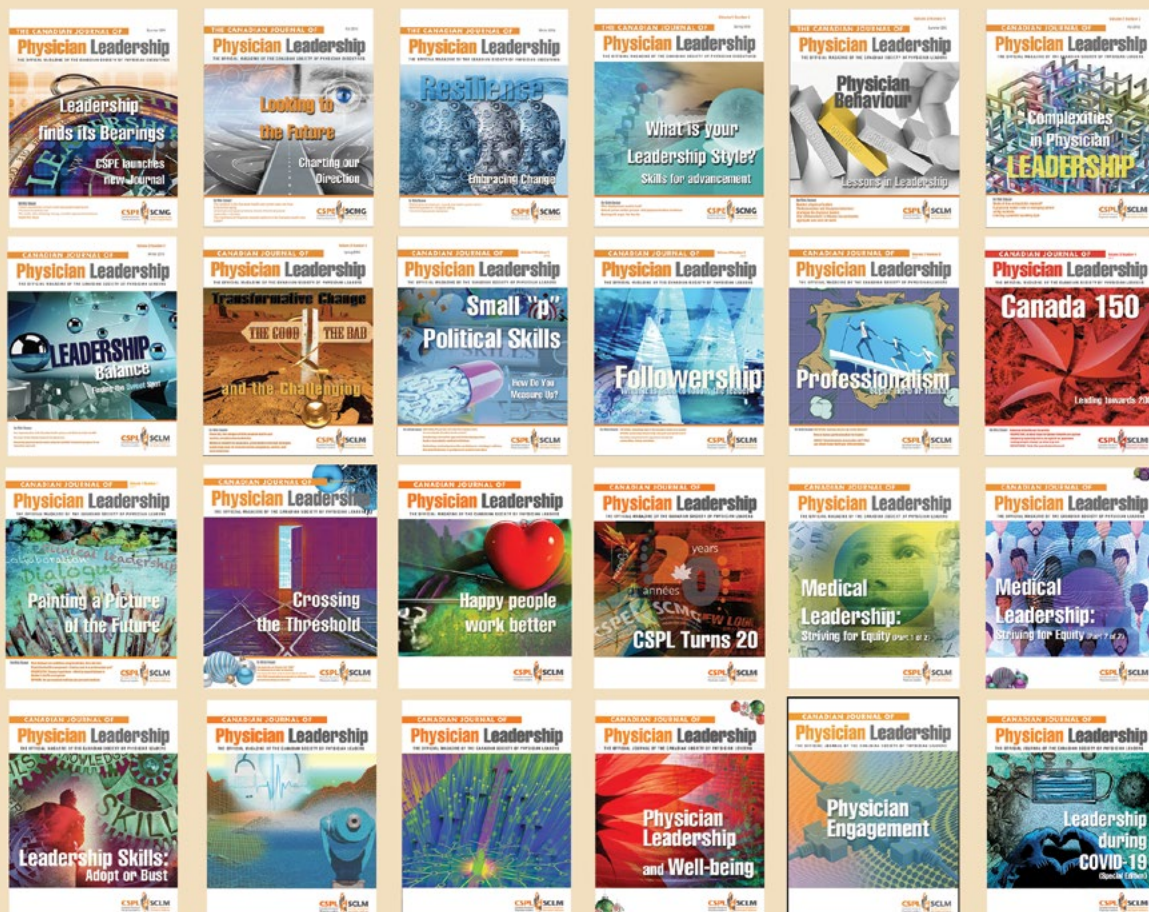
Taking action toward gender diversity and equity in medical leadership

Lina Abouzaid, Ann Brown, Lyne Filiatrault, MD, Neli Remo, Lynn Straatman, MD

In fall 2018, senior women physician leaders at Vancouver Coastal Health sounded the alarm on the lack of gender diversity among physician leaders. An appreciative inquiry was undertaken to look into the barriers women physicians were facing in assuming formal leadership roles. As women physicians, we could wait for the change or make it happen; we chose the latter option. Although our journey is not over, we wish to share our experience in the hope that it will assist others who may be tackling the same challenges.

In British Columbia, the means to strengthen relations and improve collaboration between health authorities and their affiliated physicians were described in a tripartite agreement signed in 2014 by the BC Ministry of Health, Doctors of BC, and the CEOs of six health authorities. Funding for engagement initiatives was provided through the provincial Physician Master Agreement.

One support mechanism for physician engagement was to create or strengthen pre-existing medical staff associations. In our location, the Vancouver Coastal Health Authority (VCH), the Vancouver Physician Staff Association (VPSA) was created in 2016. It includes physicians from three Vancouver hospitals and affiliated community locations, representing approximately 1900 physicians.

Improving gender diversity, equity, and inclusion has been identified as a means to broaden physician engagement. In the past few years, the gender imbalance in medical organization leadership has been called out. In VCH and many health care organizations in Canada,[1-4] women physicians are being left behind when it comes to leadership positions.

In mid-October 2018, an associate medical director within VCH asked the VPSA to look into the barriers women physicians face in assuming formal leadership roles. The request was prompted by a joint meeting where senior women physician leaders sounded the alarm on the lack of gender diversity among physician leaders. At the time, three of the authors (LA, LF, LS) were involved with the VPSA's Facility Engagement Initiative and needed little convincing to take on this challenge. As women physicians, we could wait for change to happen or make it happen; we chose the latter option. Although our journey is not over, we wish to share our experience in the hope that it will assist others who may be tackling the same challenges.

Methods

In November 2018, the VPSA held an exploratory meeting to gauge interest and determine the opinions of physicians about gender diversity in physician leadership in our organization. Attendees included 12 physicians (11 women and one man) representing a broad range of specialties, various career stages, and a mix of formal and informal leadership roles. One of the participants had dedicated their research to documenting gender diversity (or lack thereof) across specialties in medical academia, and two others were members of the Equity Committee

of the University of British Columbia (UBC) Department of Medicine. The participants shared knowledge, experiences, and personal stories to demonstrate some of the existing barriers and potential facilitators to enhancing gender diversity and inclusion in physician leadership in our organization and society at large. Some of the comments included:

I am in the department of orthopedics surgery. My entire career, I have attended meetings where I was the only woman in the room.

If you walk into a meeting of department heads with 90% women, people will stop and notice. Having 90% of men, however, is the norm.

My department head once said at a departmental meeting: "When you have a baby, you must realize the burden it puts on your colleagues."

This last quote, unfortunately, resonated with many of the participants. Along with other comments made throughout the meeting, common themes emerged, such as lack of appreciation for the value of gender diversity in clinical departments and physician leadership teams as well as unconscious bias against pregnant physicians. Several physicians' personal experiences were validated, prompting the realization that "it's not just me." This meeting galvanized the attendees to strive to close the gender gap in physician

Figure 1. The 5-D cycle of appreciative inquiry

Source: Adapted from Cooperrider et al.[5]

leadership ranks. It also highlighted the need for objective baseline demographic data on physician leaders. To create change, an appreciative inquiry (AI) approach was selected, rather than the more familiar problem-solving method.

We hired an AI coach and assembled a core team of nine women physicians and two members of the VCH Physician Relations and Compensation Department. The team led an AI process to identify diversity goals and objectives among physicians and administrative leaders at VCH.

In a future article, we will focus on the AI change process. For now, suffice it to say that "appreciative" starts with a positive mindset; it focuses on finding the existing strengths in the current system and seeks to grow these into a desired future state. Tapping into positive emotions unleashes creative ideas, dreams, hopes, and

possibilities and, thus, powers the change process. "Inquiry" refers to the questioning involved in the five stages of the AI process: define, discovery, dream, design, and deliver (Figure 1).

Two AI sessions were held. The first, in January 2019, focused on "discovery" and "dream." The VCH board chair, Dr. Penny Ballem opened the session by sharing her own experiences from 30 years earlier. She offered her support and hope that we would not be discussing the same issues in ten years. This first session was attended by 20 physicians, 17 women and three men, representing a diverse range of departments and divisions.

In preparation for the second session, the core team reviewed, revised, and affirmed the possibility statement and its essential elements. It then identified some of the work and actions the organization needed

to initiate (or strengthen) and the stakeholders who should be involved.

This information seeded the second AI session in April 2019, which was attended by a growing number of participants. More than 40 physicians, including physician leaders from VCH and UBC Faculty of Medicine, as well as senior executives (including CEOs) from VCH and Providence Health Care, all came together to "design," defining the components of each of the essential elements and identifying strategies and actions required for the next stage: "delivery."

The design session provided additional material to leverage and incorporate into our final report and action plan. This report, *Using All Our Talents: Meaningful Leadership Opportunities for Women Physicians* at Vancouver Coastal Health, was shared with our core team and all AI participants and is accessible on our VPSA website, under resources.[6] It has also been distributed to other organizations actively focusing on diversity, equity, and inclusion, such as Doctors of BC, UBC Faculty of Medicine, and the Canadian Medical Association.

On 26 September 2019, Using *All Our Talents* was presented to the VCH board. The action plan was endorsed, with "diversity" expanded beyond gender to include the many other important facets of diversity, both visible and invisible. The VCH Diversity, Equity and Inclusion Committee was created as a collaboration

between VCH administrative staff and physicians. The committee is accountable to the VCH senior executive team and is responsible for implementation and operationalization of the actions and recommendations made in the final AI report.

Results

Demographics

To move to where you want to be, you need to know where you stand at present. "Numbers? Why would you want numbers?" came the response to our request for data. Nonetheless, thanks to our colleagues in the VCH Physician Relations and Compensation Department, the physician credentialing database was mined. It revealed that, in 2018, women held only 36 of 186 physician leadership positions. Whereas 43% of physicians at VCH were women, only 19% of the medical leadership roles were held by women. This ratio has been stable for the past three years, with an increase of only 1% a year. At this rate, gender parity in our physician leadership ranks will be achieved in 31 years.

Appreciative inquiry

Define: The affirmative topic selected to guide the direction of the AI was "Meaningful leadership experiences and opportunities for women physicians: women and men physicians participating together and equally in strong leadership roles at Vancouver Coastal Health."

Discovery and dream: Through paired interviews and table discussions, the January session

produced a description of a positive future also known as a possibility statement.

We are an organization that values women, in all their diversity, as leaders. There is a supportive corporate culture at VCH for empowered woman physician leadership.

At all stages of their careers, women are actively supported to develop leadership skills and knowledge by a culture that provides learning and experiences, including opportunities to collaborate, network, and lead.

We actively sponsor and mentor women to ensure equal representation in leadership.

Women always have a seat at the table.

Success begets success!

To support VCH in becoming this organization, four essential elements were identified:

- culture and environment – grow a culture that visibly values women physicians in leadership
- talent management and succession planning – make this part of standard practice and include diversity, equity, and inclusion principles
- meaningful metrics – capture the diversity of those in leadership roles and in the leadership pipeline; track the outcomes associated with more diverse physician leaders
- leadership skills – women and men physicians confident and prepared to lead

Design: The conversations around design emphasized the need for organizational culture change with a move away from what is perceived as more "male" attributes, setting the standards for leadership excellence.

There was discussion about how to un-bias the hiring process for physician leaders, from posting, shortlisting, interviewing, through to selection. This was viewed as necessary to ensure transparency and that hiring is truly based on established predetermined criteria rather than proverbial "fit." When recruiting into an existing leadership team, "hiring for diversity" would make sense.

> VCH needs to embrace ALL of its physicians and will benefit greatly from improving engagement with the nearly half of their workforce that is currently culturally excluded from leadership.

Additional participants' comments included addressing the "boys' club" environment, "unconscious bias in current leadership succession" and "implicit bias — assuming women are busy and not interested."

Many participants felt that the organization must value physician leadership more by providing protected time, administrative support, and better compensation. As well, it was noted that too often leaders' activities and meetings are scheduled as bookends to busy clinical days, thus creating logistical issues for those with family responsibilities. Participants' suggestions included:

Figure 2. International Association for Public Participation[7] model of engagement, adapted for physician engagement with Vancouver Coastal Health administrative leaders
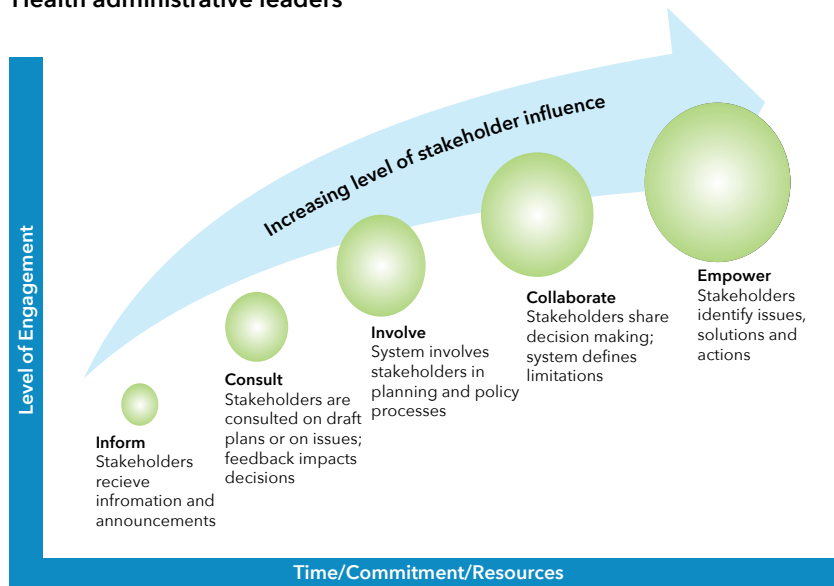
Consider co-leadership roles to increase flexibility.

Fund more positions to create smaller roles that can be taken without a 14-hour day.

Participants recommended early identification and development of future physician leaders. This would avoid the issue of physicians stepping into leadership roles with too little preparation and needing to learn on the job.

When asked what they valued most about the two AI sessions, the attendees consistently mentioned meeting other physicians and the opportunity to interact with leaders, "hearing other's ideas," and "generating ideas for change together." This flies in the face of the common belief that women do not like to "network"; perhaps it's all in the framing.

Deliver: The VCH Diversity, Equity and Inclusion Committee was created and, based on the adapted International Association for Public Participation's[7] engagement spectrum (Figure 2), is a true collaboration between

Figure 3. Vancouver Coastal Health (VCH) Diversity, Equity and Inclusion Committee and subcommittees

VCH administrative staff and physicians. The committee, which is accountable to the VCH senior executive team and responsible for the implementation and operationalization of the recommendations of the final AI report, oversees three working groups (Figure 3), each charged with taking the lead on the tasks and actions required to support and develop their respective essential elements. Two of the original four working groups, Talent Management and Succession Planning and Leadership Skills, were merged into one to ensure that their work is integrated.

The main goal of the Culture and Environment Working Group is to propose processes and structures to grow a culture that visibly values diversity in physician leadership. The Leadership Skills, Talent Management and Succession Planning Working Group is tasked with developing leadership pathways that identify physician leaders early while applying diversity, equity, and inclusion principles, with the ultimate goal of developing confident and competent leaders. The leadership pathways will include both workshops and experiential learning. Physician leaders will be supported through mentorship and sponsorship.

The third working group, Meaningful Metrics, is tasked with developing a formal mechanism to collect and track meaningful quantitative and qualitative metrics on diversity to show impact and change over time. As one

participant expressed, its goal is to "emphasize the value of diversity, showcase the benefits of diversity in composition and how it leads to better outcomes/excellence, so diversity is supported not out of necessity but for its value."

Diversity, equity, and inclusion in medicine and in medical leadership benefit everyone. Ensuring those qualities is everyone's responsibility.

Discussion

Our appreciative inquiry came at an opportune time. For some time now, there has been a clamour for gender diversity in the executive suite and on boards of companies. On 31 December 2014, the Ontario Securities Commission introduced a mandatory disclosure requirement for gender diversity on boards and executive teams of Toronto Stock Exchange listed companies. As of 1 January 2020, all corporations falling under the *Canada Business Corporations* Act are subject to new diversity disclosure rules, including the representation of women, Indigenous peoples, people with disabilities, and members of visible minorities on boards of directors and in senior management.

It was only a matter of time before attention turned to the "house of medicine." Scrutiny came in 2018, thanks to Ontario physicians sounding the alarm on longstanding discriminatory hiring practices of an emergency department chief.[8,9] The conversation continued with the Federation of Medical Women

of Canada and the Canadian Medical Association, which jointly published Addressing Gender Equity and Diversity in Canada's Medical Profession: A Review.[10] In December 2019, the Canadian Medical Association released its Equity and Diversity in Medicine policy.[11]

In the fall of 2019, the BC medical association released its own Diversity and Inclusion Barrier Assessment Report.[12]

All this momentum gives us hope for a more diverse, equitable, and inclusive future in the profession of medicine.

Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.
– Margaret Meade

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Acknowledgements

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Physician burden — not just for physicians anymore

Colleen Grady, DBA

It is well known that physician burnout is reaching epidemic levels, and this should be a critical concern for anyone in health care. Health care leaders are dedicated to environments where compassionate care is provided to patients; however, non-clinical leaders are often unaware of the gravity of physician burnout and the impact it has on patient care. A pilot study to explore strategies to achieve the quadruple aim and to understand leaders' perceptions about physician burnout has provided valuable insights which are informing a larger, national study on this important topic. Through a better understanding of organizational barriers to physician wellness, a more comprehensive approach to addressing the crisis of burnout among physicians is possible.

KEY WORDS: physician burnout, organizational culture, joy at work, compassionate leadership

Autonomy, mastery, and purpose are what motivate us according to Daniel Pink.[1] Nowhere is this more evident than in health care. Health care professionals value their autonomy based on their unique knowledge and position. They are committed to mastery of skills as health care evolves and is driven by a larger purpose – to care for the sick and vulnerable. Creating a workplace that allows people to have significance, to feel joy in their profession, and to fulfill their sense of purpose is increasingly compromised as the speed of change coupled with escalating expectations is putting unprecedented demands on health care professionals.[2] Physicians are particularly affected, with burnout rates at an all-time high.[3] The consequences of physician burnout are plentiful; in addition to the huge personal toll, there are issues related to patient safety and access to care.[4] Leaders in health care are uniquely challenged to care for the carers and to foster workplaces that are meaningful, engaging, and built around a culture of wellness that can keep burnout to a minimum.[5] A workforce that is engaged and feels part of the team is critical to organizational effectiveness.[6]

Care for providers is the fourth pillar of the "quadruple aim," added to Berwick's triple aim[7] –better health, better care experience for patients, and better value for health care dollars. Bodenheimer and Sinsky[8] posit that the absence of focus on the fourth aim "imperils the triple aim" and the Ontario Medical Association[9] terms the fourth goal the "foundational element," necessary for the first three objectives to be achieved. Leaders in health care are dedicated to environments where compassionate care is provided to patients; however, their awareness of the gravity of physician burnout and priorities to address it are largely unknown. Although an integral part of health care organizations, physicians are often not considered employees and have their own culture as professionals. They are accustomed to working long hours and putting high demands

on themselves which can lead to burnout, high attrition rates, and even suicide.[10]

A pilot study to explore strategies to address the fourth pillar of the quadruple aim and understand leader perceptions about physician burnout is informing a larger, national study on this important topic. Eleven administrative leaders from health care organizations in southeastern Ontario, from family health teams, community health centres, and hospitals, participated in semi-structured interviews followed by inductive analysis. This study was approved by Queen's University Health Sciences Research Ethics Board.

Leaders define the culture

From front-line leaders to boards, the value of investing in development and ensuring a collaborative team is crucial to influencing culture. Two-thirds of participants acknowledged that disruptive change challenges our ability to feel joy at work. Recognizing accomplishments, measuring satisfaction regularly, and prioritizing healthy workplace strategies were identified as very important by all leaders, but only three of them indicated that these applied to the physicians in their organization.

References to physician culture indicated a distinct separateness and the division increased in reference to strategies to achieve the quadruple aim. While acknowledged for commitment to patient care and admired when they interact well with staff, physicians were seen as autonomous professionals who were often approached "with kid gloves." Factors related to physician burnout were not viewed in an organizational context, but seen as relative to systemic pressures and, in some cases, the fault of the physician themselves. Their inability to say no, their insistence on taking on more than one job, and, for physicians of advanced age, the lack of education about work-life balance were seen to be contributing to higher stress levels.

Burnout — the visible and the invisible

Burnout is described as a work-related syndrome that includes three elements: emotional exhaustion, depersonalization, and a decreased sense of accomplishment.[11] Physicians are especially vulnerable to burnout as shifting priorities of government and productivity expectations
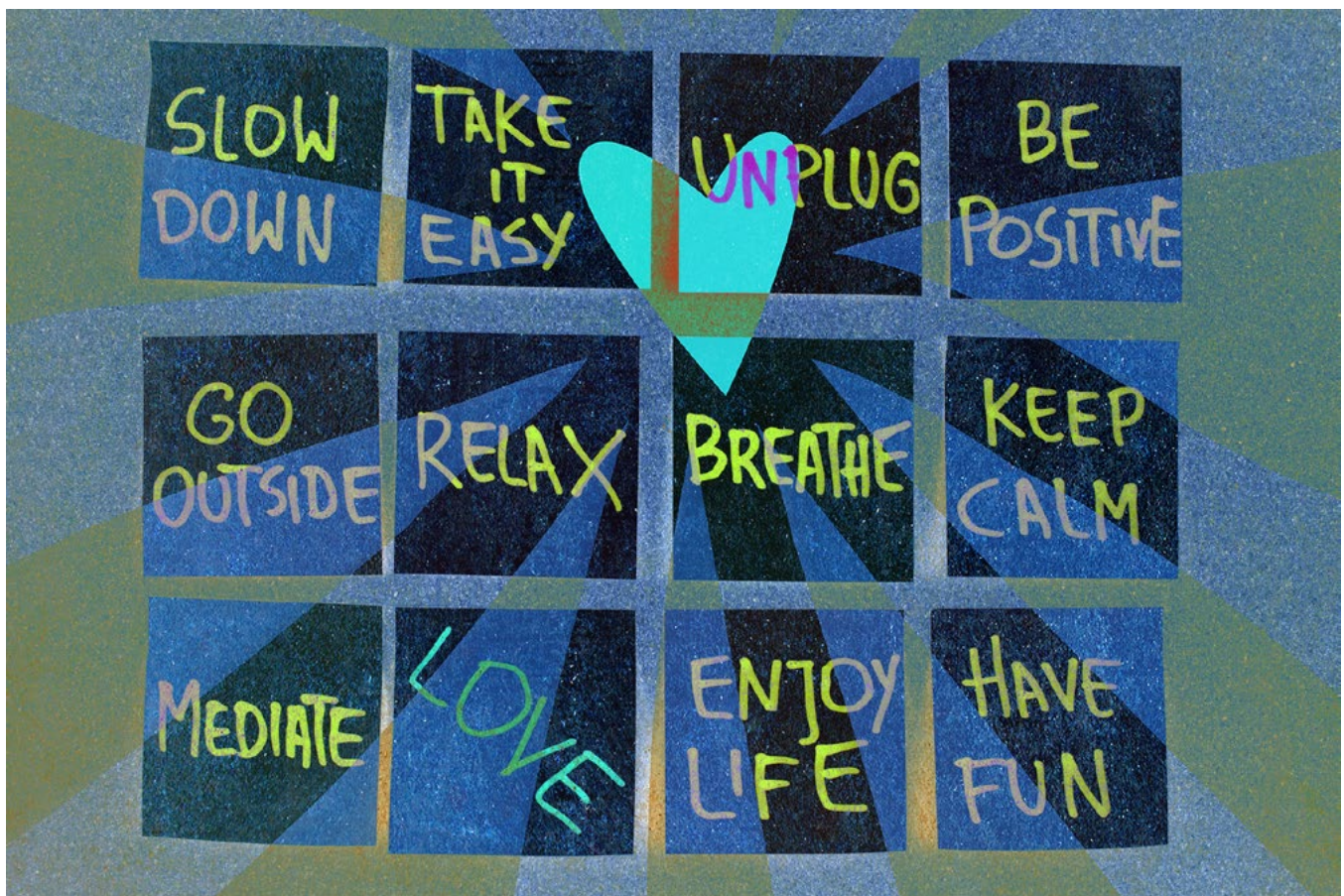
have led to a work life filled with higher administrative demands. This leaves less time with patients, which was their purpose in choosing this profession.

Physicians are often viewed by the public as well paid, despite being expected to work long days, be constantly available, possess the most current knowledge, and remain healthy and competent to provide outstanding patient care. For those who admit to burnout, the stigma attached is far greater than for others in health care, with much of the literature suggesting that resilience and self-care are the obligation of the physician. Physicians are held to a different standard, generally expected to heal themselves and blamed for ignoring the signs.[12] Framing wellness as an individual

responsibility only blames the victim.[10]

Participants were able to identify what burnout looks like and knew of its effect on others, although most were not aware of any physician in their organization currently suffering ("those things are really personal"). Increased patient demands and administrative workloads, unrelenting expectations from government, and burdening by peers who ask physicians to cover for them when taking time away from work were seen by the administrative leads as the biggest frustrations for physicians.

Joy in the workplace

Although recruitment of physicians was identified by

each of the participants as the "biggest crisis in this area," no connection to workplace culture was acknowledged. Having a full complement of physicians in the organization was seen as critical, but a lack of focus on joy in the environment where physicians practice was clear. "Recruitment is a challenge. We are sitting at a bit of a melting point, there's not a doubt."

We know that physician burnout is at epidemic proportions, and the consequences of burnout affect not only physicians' health but the health of patients and their access to safe care. The health care system is also impacted as it must deal with high turnover and costly departures from the profession. Another crisis of this magnitude would accelerate the time it takes

for an organization to find the resources necessary to turn this situation around.[4]

Few studies exist that demonstrate the value of reducing physician burnout. One randomized controlled trial demonstrated that providing supports for physicians had significant impact.[13] Results indicated that when physicians were given an hour of protected and paid time biweekly, they experienced fewer symptoms of burnout. Those given an hour of protected and paid time spent in small peer group learning (also biweekly) showed even greater decreases in burnout and an increase in job satisfaction that was sustained for a longer period.

Call to action

Further research related to team environments and the leader role in achieving the quadruple aim for everyone in the organization, physicians included, is needed. Compassionate leadership presents a model that can provide insightful discussion among leaders to encourage making the connection between caring for the carers and caring for the patients. Health care leaders who underestimate the importance of an engaged and supported workforce that includes physicians do so at the expense of patient safety and quality care. Along with external threats to the organization, leaders must consider exhaustion, cynicism, early retirements, and disengagement of physicians, as these internal threats seem abundantly clear. Stemming

the erosion "from the inside"[5] should be a priority for organizational leaders so that physicians can continue to provide compassionate care to the sick and vulnerable. After all, compassion is the essence of health care.

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This article has been peer reviewed.

ADVICE

Coaching competencies for physicians: goals, values, and beliefs

Nancy M. Merrow, MD

In this series of articles on coaching competencies, we have been exploring how the coach approach fits into medical practice and leadership. In coaching, artful questions and deep listening skills are used to identify the person's goals, intentions, and inner resources that will be drawn on to move forward. In this article we explore how a professional coach would use additional tools and techniques to augment the structured conversation.

So far in our series we have explored the basic concepts of coaching[1] including listening at the next level[2] and how to create artful questions.[3] We compared coaching, mentoring, and sponsorship and explored how coaching fits into the toolbox

The professional coach uses tools and techniques in addition to coaching conversation skills.

of the physician in patient care, teaching, and leadership. Other structured conversational techniques and therapies, such as motivational interviewing, solution focused therapy, and cognitive behaviour therapy are familiar to most physicians and each has its place. In this article we explore how a professional coach would use additional tools and techniques to augment the structured conversation. Physicians may wish to consider how these options might fit into their encounters with patients or trainees.

Coaching is not therapy. It is used when a fully competent person asks for help and is willing to be coached, as opposed to seeking advice or a solution. The coach approach draws out the person's own capacity to resolve their issues. The coach suspends their own opinions and judgement about what might work and uses their ability to listen and ask the right questions to help the person reach an insight that they are prepared to act on. Usually, the coach assists by offering to help hold the person accountable to their intentions in some agreed upon fashion.

The coach leverages the relationship with the person being coached by co-creating a safe, trusting environment for conversations that may be intensely personal and challenging. By listening with intent and purpose, the coach will identify beliefs, thought patterns, and assumptions that are held by the person and that may be holding them back from committing to what they say they want. By surfacing the core values and principles that the person lives by, the coach can help design tasks and actions that are more likely to be followed through by the person.

Many physicians have experience in setting realistic goals and helping others to do the same. Various frameworks exist, such as SMART goals (specific,

measurable, achievable, relevant, and time bound).[4] Every coaching conversation is designed to result in the person deciding to act in a specific way toward their stated goal. There is a "nest" of goals in a coaching encounter. Each coaching conversation should result in a next step toward the overall goal and each step requires some action that is SMART. Let us use the example of achieving a desired residency placement and review the roles of the mentor, the sponsor, and the coach for the trainee.

Case study

Ahmed (not a real client) is planning his last two years of medical school by choosing electives and exploring various specialties. He has excelled in all aspects of his learning and training and will be a sought-after resident for multiple programs. His uncle has acted as a mentor for Ahmed for many years. He has introduced him to his physician network, invited him into his practice as an observer, and shared with him the challenges he faced as a trainee and young physician. He has supported him by talking about choices that he made and what he has learned from experience. He imparts knowledge about the path he has traveled so that the same or a similar path will be illuminated for Ahmed if he chooses it. Their relationship is warm and casual, and interactions are candid.

Several of Ahmed's preceptors have identified him as a high potential learner who is self-directed and reflective. One or two

Table 1. Sample list of values

Accomplishment	Excellence	Orderliness
Accuracy	Focus	Participation
Acknowledgement	Forward the action	Partnership
Adventure	Free spirit	Peace
Authenticity	Freedom to choose	Performance
Beauty	Full self-expression	Personal power
Collaboration	Growth	Productivity recognition
Community	Harmony	Risk taking
Comradeship	Honesty	Romance
Connectedness	Humour	Service
Contribution	Independence	Spirituality
Creativity	Integrity	Success
Directness	Joy	To be known
Elegance	Lack of pretense	Tradition
Empowerment	Lightness	Trust
Esthetics	Nurturing	Vitality

of them have acted as sponsors for him without his awareness. Their formal evaluations of him have been thorough and thoughtful, and they have taken steps to ensure that other preceptors know his attributes and that their confidence in him is well placed. Ahmed feels confident that they would provide helpful references for his residency applications. They introduce him as a candidate for leadership or research opportunities and encourage him to stretch himself.

When faced with multiple considerations about the crucial final years of medical school and a choice about what residency to pursue, Ahmed has factors to weigh in addition to a career path. Not all his goals, values, and beliefs have been fully explored, and it just does not seem comfortable to confide everything to his uncle or his preceptors as they have significant roles to play in his eventual success. At a deeply personal level, Ahmed has some doubts about the way his uncle's life has unfolded, as he is divorced and raising a second family and has had some financial setbacks. Similarly, Ahmed feels that his

preceptors should not know all his doubts and fears about the choices before him. He needs a neutral, non-judgemental confidante. He connects with a professional coach recommended by a fellow student.

Ahmed's coach listens to his thoughts and ideas about his residency selection, then asks him the best coaching question of them all: "What do you want?" After some halting dialogue and uncomfortable silences, the coach suggests that they work through a values and beliefs exercise. From a sample list of values (Table 1), she assigns him homework to identify those that are most important to him, grouping some together if there is a theme. His task is to rate how well he is living his values currently, as well as to imagine one action that would improve each rating.

When Ahmed returns for his next coaching session he has identified and organized his values and rated his current ability to live them (Table 2). He has also set a goal for himself for each set of values and stated one action that would move the rating.

Table 2. Grouping and rating values

| Values | Ability to live these values* | | Potential action |
	Current rating 0-10	Desired rating 0-10	
Adventure, Growth, Risk taking	1	7	International mission work
Contribution, Excellence, Service	7	8	Mentor future medical students learn to teach
Community, Peace, Tradition	4	8	Resume faith practices
Creativity, Humour, Participation	3	9	Join the medical student talent show committee

*Ratings range from unable (0) to highly able (10) to live these values.

The coach introduces him to the concept of "limiting beliefs." Ahmed takes home another exercise to reflect and record what he believes about his ability to move forward with planning a residency placement and a career that aligns with his goals and values. His notes include:

1. I believe that my chances of securing a desired residency are at risk if I do not follow my uncle's advice.
2. I believe that my third year of medical school is a make or break time for my ultimate success.
3. I believe that putting my efforts into following a narrow-focused path is the safest way to get ahead.

In a series of three sessions, the coach asks Ahmed numerous clarifying questions about his limiting beliefs and gives him tasks to do, such as fact finding and talking with some of the clerks, residents, and preceptors whom he respects. Ahmed also decides to have a more candid conversation with his uncle about what happened in his professional life that may have impacted his marriage.

On resuming some of the faith practices that he learned as a boy and having an outlet for his creativity and sense of humour with the team organizing the talent show, Ahmed begins to interact with some fellow students who have many different views about the path to success. His limiting beliefs are diminished.

Figure 1. How examining values and beliefs leads to achievement of goals

Values
- Identify and prioritize values
- Take action to align current experience with values

Beliefs
- Reflect on limiting beliefs
- Network and get facts to challenge limiting beliefs

Goals
- Achieve a residency placement
- Live a life more congruent with values
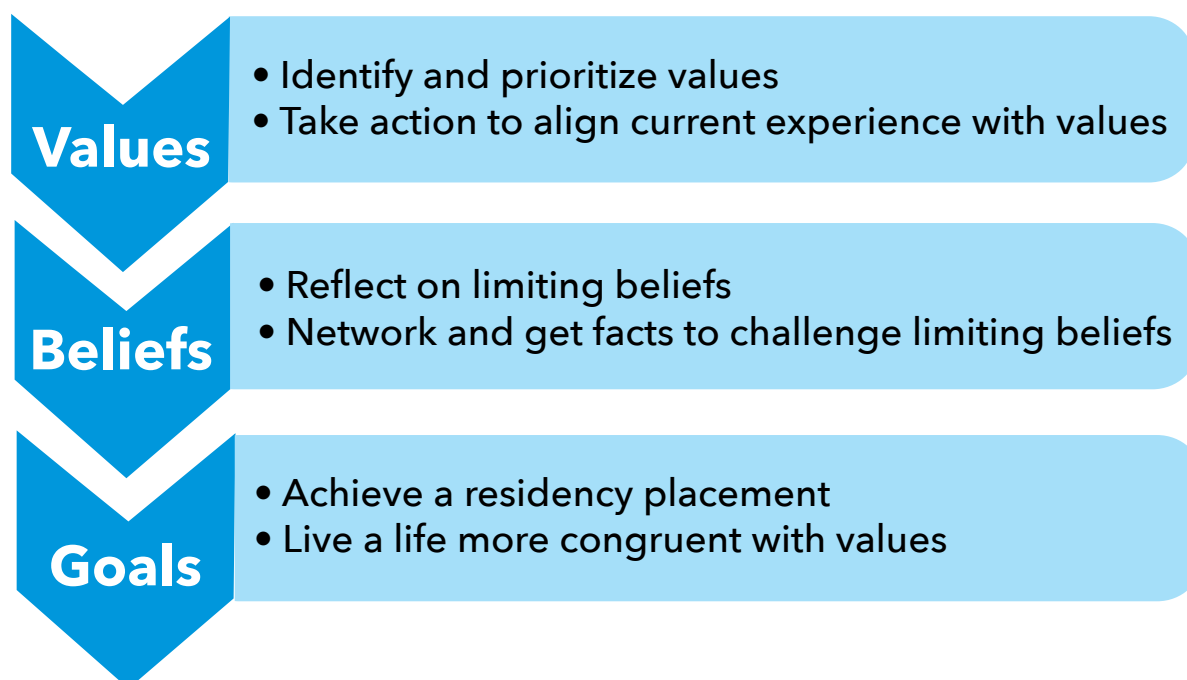
Finally, Ahmed sits down with his parents to talk about the possibility of using some of his elective time to join a mission to an emerging country to build health infrastructure.

While away overseas, Ahmed meets an ophthalmologist who travels three times a year to remote locations to do cataract and corneal surgery that is life altering for her patients. On returning home, Ahmed seeks out electives that lead him into the surgical field and ophthalmology as a specialty. His eventual answer to the question "What do you want?" was illuminated by his own reflection on what really matters to him and what was holding him back. By taking some actions to align his current student experience more closely with his core values, he connected differently with his peers, his mentor, and his family, and that shaped his approach to applications for electives and residency placements.

The nest of goals that led to this outcome of Ahmed's coaching experience is illustrated in Figure 1.

Core competencies for using the coach approach

Coaching fits with the management of situations that are dependent on the patient or person making choices, decisions, and changes. The goals and the solutions are theirs. By acting as a coach when people bring you problems that are within their control, not yours, you build their capacity for problem-solving. Further, the relationship is clarified and strengthened, whether it is doctor–patient, teacher–student, or leader–team member.

In a series of future articles in CJPL, I will continue to adapt the core competencies for the coach approach for physicians and medical leaders (Figure 2) and discuss the specific skills that comprise each. My next article will be about relationships.

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Figure 2. Coaching competencies for physicians
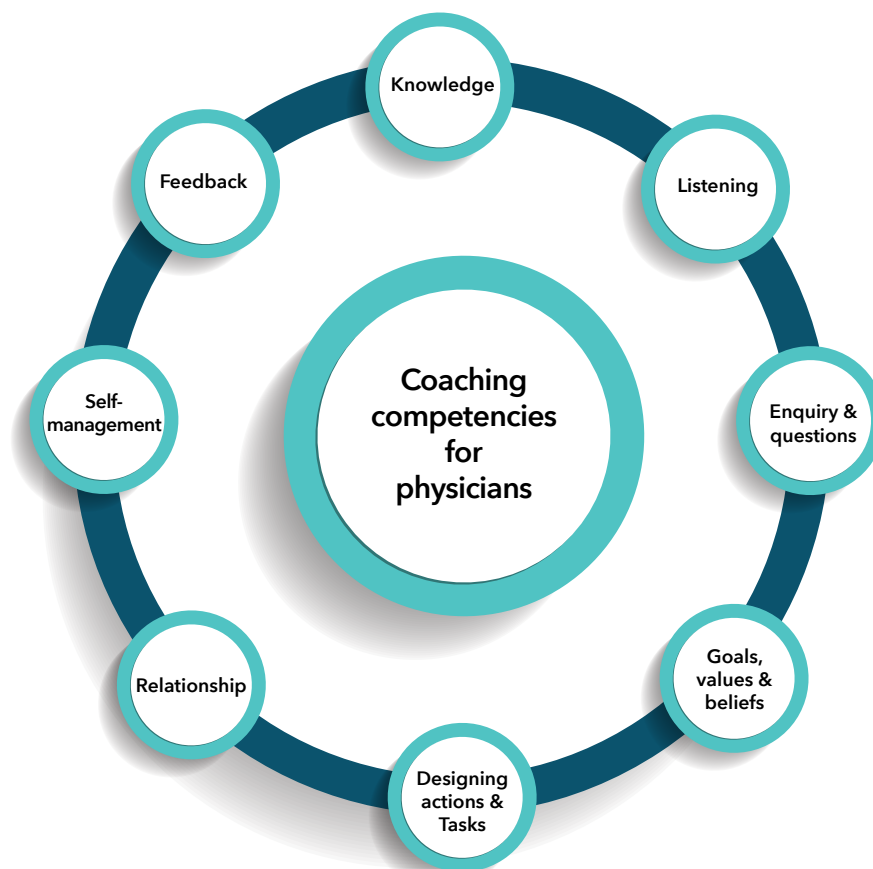
OPINION

Take Black excellence all the way to the top

Addressing Black underrepresentation in Canadian medical leadership

Henry Annan, MD

Since 1867, the Canadian Medical Association has served as the national representative body of the medical profession in Canada. Of the 153 people who have headed the organization, none of them has been Black. The first Canadian medical school was founded in 1824; Canada now boasts 17 medical faculties. Of the scores of individuals who have served as medical faculty dean in Canada, none has been Black. Each year, six Canadian "role models of excellence in health in Canada and the world" are inducted into the Canadian Medical Hall of Fame. Of the 137 people on whom this honour has been bestowed, none of them has been Black.

The goal here is not to admonish Canada's most revered medical organizations, but rather to illustrate the historic and longstanding dearth of Black representation in Canadian medical leadership. Over the past few years, calls to address barriers to achieving diversity in the Canadian health workforce have been gaining momentum. Diversity exists along a broad spectrum that includes gender, socioeconomic, linguistic, and racial subsets, to mention a few. Acknowledging that there exist many populations that are also underrepresented in the highest echelons of Canadian medical leadership, this article speaks specifically to the paucity of Black Canadians in formal physician leadership roles while proposing four key recommendations for addressing this diversity gap.

Step 1: Recognize the problem. Start the dialogue.

The first step in proposing a solution is to identify and acknowledge the problem. It is unclear whether the Canadian medical community recognizes the extent to which people of Black descent are underrepresented in formal leadership positions in the health care system and academic medicine.

Even when this under-representation is appreciated, it may not necessarily be seen by all as a result of inequitable policies. The lack of knowledge about the impact of systemic racism on determining who is and is not at the proverbial table is at least partly reinforced by a lack of engagement in constructive conversations about racial bias in Canada.

Race dialogue is difficult for a variety of reasons. Dr. Derald Wing Sue[1] of Columbia University describes three ways in which discussing race conflicts with a variety of societal norms, making race-talk a Herculean task in today's society. First, discussing race necessitates a violation of the "politeness protocol,"

that is, the notion that topics that are potentially offensive or uncomfortable should be avoided, ignored, silenced, or discussed in a superficial manner. Race dialogue inherently provokes discomfort. Second, race dialogue violates the "academic protocol," which implies that discussions taking place at an intellectual level should be objective and rational, devoid of emotion, and value empiric data over experience. Race dialogue is bound to be emotional and deeply personal. Finally, race dialogue violates the "colour-blind protocol" — the belief that race is irrelevant and all individuals should be judged on agreed-upon internal attributes alone. The fundamentals of race dialogue reject a meritocratic system.

One may argue that the individual impact of race dialogue is most profound and most assured when these discussions occur face-to-face. As such, constructive race dialogue must be a pervasive phenomenon in the Canadian medical community. It must occur in the boardrooms of Canada's medical institutions, in medical faculty classrooms, and at the highest decision-making tables.

Although it will not always be comfortable, race dialogue should strive to be productive; that is, it must have a defined purpose. Constructive race dialogue can "improve communication and learning, enhance racial harmony, increase racial literacy, and expand critical consciousness of one's racial/cultural identity."[1] If a larger community of physicians understands the leviathan challenges at hand in addressing the racial diversity gap in medical

leadership and commit to doing the required work, the individual workload becomes lighter. It is incumbent on the "enlightened" majority to recognize its responsibility in initiating and sustaining these conversations. This is work that is worth doing by everyone.

Step 2: Increase the number of Black medical students in Canadian medical faculties

Increasing the number of Black physician leaders requires a critical number of Black physicians in the physician workforce. Achieving a critical number of Black physicians in the physician workforce requires an increase in the number of Black students in medical schools. Recent evidence suggests that the medical student make-up in Canadian medical schools continues to lag behind in its representation of Black Canadians. In 2002, Dhalla et al.[2] estimated that only 1.2% of medical students identified as Black compared with 2.5% of the Canadian population aged 18–24 years. The most recent survey by the Association of Faculties of Medicine of Canada (AFMC) to include racial data was performed in 2015. The 2015 AFMC Graduation Questionnaire National Report[3] achieved a 75.8% response rate. Of those who responded, only 0.8% identified as Black (e.g., Black African, Black Caribbean, Black North American, etc.). A more recent cross-sectional study by Khan et al.[4] surveyed almost 1400 medical students in 14 English Canadian medical schools. Respondents

were less likely to identify as Black (1.7%) compared with the census population (6.4%) suggesting further underrepresentation of Black students in Canadian medical faculties. Suffice it to say, there has been no appreciable improvement in the representation of Black medical students in Canada in almost two decades.

There are obvious social accountability reasons why every effort must be made to ensure that medical school classes are reflective of the populations they serve. Medical students from underrepresented minority groups are more likely to practise in underserved populations and receive better satisfaction scores from minority patients.[5,6] They are also more likely to provide care that is culturally safe.[5] Furthermore,

white students who attend a medical faculty with a diverse student body feel better prepared to care for patients from minority populations than those from less diverse programs.[7] Racial diversity in medical school may also lead to more underrepresented minority physicians in leadership roles down the road.

In 2010, Page et al.[8] sought to identify factors that contributed to medical faculty diversity in the United States. The authors conducted a cross-sectional survey of diversity program leaders in 106 US medical schools. Of the diversity program characteristics studied, high racial medical student diversity ten years prior was most strongly associated with current medical faculty diversity. The authors went on to conclude

that, while this association may in part be explained by higher population densities of underrepresented minorities in certain states over others, improving the ethnic and racial minority representation among medical student matriculants may lead to a more diverse medical faculty in the future.

Increasing medical school diversity requires deliberate and purposeful effort. Policies that acknowledge historical racial inequities and seek to correct them remain among the most effective strategies in increasing racial diversity in medical schools. The University of California offers an interesting case study on how efforts to make student populations more racially diverse can be futile if race is not considered in application and

selection processes. In 1996, the state of California adopted Proposition 209, which banned the use of affirmative action policies by California universities as a means to diversify their student populations. Immediately after its implementation, the number of underrepresented minorities at the University of California dropped significantly, and subsequent efforts to restore the number of racialized students to pre-Proposition 209 levels have fallen flat.[9]

Affirmative action to increase racial diversity need not be controversial. Similar programs to increase the representation of other underrepresented populations have been enacted with great success. The Northern Ontario School of Medicine (NOSM) was established in 2005 by the Ontario government to meet the health needs of residents of Northern Ontario.[10] Today, most NOSM graduates practise in Northern Ontario.[11] Simply put, if the goal is to increase the number of medical students from an underrepresented group, affirmative action policies are a tried and true mechanism for achieving this objective. The University of Toronto Faculty of Medicine's Black Student Application Program was established in 2017 to increase the number of Black medical students at the university. As a result, the number of Black medical students has grown from 1 in the Class of 2020 to 24 in the Class of 2024—the largest cohort of Black medical students in the school's history.[12] Programs such as Toronto's offer a blueprint that other medical

faculties may follow to further diversify their medical programs.

Step 3: Create environments where Black medical learners and physicians can thrive

The experience of Black people in the Canadian medical community is poorly studied in the literature. However, there is evidence to suggest that acts of racism and racial microaggressions directed toward racialized minorities are relatively common. A 2003 survey of third-year Canadian medical students showed that racialized minorities were more likely to feel as if they did not "fit in" at their medical school compared with non-racialized groups.[13] In the 2019 AFMC Graduation Questionnaire, approximately 1 in 10 respondents reported being subject to racially or ethnically offensive remarks at least once.[14] American data show that medical faculty from minority groups were more likely to experience racial discrimination by their peers or superiors compared with their white counterparts.[15]

Racism is recognized as a key determinant of health, with victims of racism experiencing worse physical and mental health outcomes than the general population.[16] By compromising their well-being, racial discrimination in the workplace prevents Black physicians from effectively discharging their duties as health care providers. Consequently, the types of professional development activities that make the path

toward leadership roles in medicine possible cannot occur in learning and working environments that breed racism. In health systems science, the Quadruple Aim framework dictates that the well-being of the care team is essential to achieve optimal health system performance.[17] Thus, it is imperative that the unique factors that negatively impact the health of Black medical learners and physicians be identified, mitigated, and eliminated for them to excel as health care providers.

Medical education curricula are likely to perpetuate racial microaggression that has gone unidentified by predominantly white educators. The mental well-being of Black medical students is threatened with each racist encounter. Some examples of racial microaggression in the classroom include reinforcing the notion that certain diseases occur only in certain minority populations, stereotyping racial minority patients in case-based learning, failing to recognize how some disease conditions may present in minority patients, and ignoring racist commentary that arises during group discussions. To preserve the health of Black student physicians, medical education must be culturally safe and race informed. Equipping all medical students and faculty with tools to engage in race dialogue and to recognize their own racial biases further promotes safe learning environments for Black medical students. Medical faculties must also institute policies that encourage reporting of racism faced by Black medical learners

and guarantee swift, effective corrective action.

Navigating the medical professional landscape in medicine may be more difficult for Black medical learners and early career physicians because of the lack of Black role models. Mentorship programs within academic medicine are influential in determining career choice and personal development.[18] An important study in 2013[19] identified strategies that succeeded in increasing faculty racial diversity in US medical schools. Mentorship by experienced minority faculty and a "grow your own approach," where minority learners were mentored with the specific goal of transitioning them into junior faculty members, were cited as exemplary initiatives. Clear commitment from administrative leadership to promoting diversity positively influenced recruitment and retention of minority physician leaders. Mentorship programs designed to develop Black medical students and early career physicians into leaders in their fields may, therefore, be an effective strategy for increasing the diversity of Canada's physician leadership community.

Step 4: Study the issue. Track progress.

In Canada, there is little to no information about the racial diversity of the physician workforce. Until 2016, results of the AFMC's Graduation Questionnaire contained the most robust data on Canadian medical student demographics including race. Demographic data have since been excluded from the questionnaire. This is in contrast to the American Association of Medical Colleges, which collects race data of American medical students each year. To the author's knowledge, there is currently no program that tracks racial diversity in medical schools in Canada, making it difficult to refine national policies designed to increase racial diversity in Canadian medical faculties.

Black Canadians are among the most severely underrepresented minority groups in medicine.

In addition, although large-scale surveys have looked at the wellness of Canada's physicians and medical learners, these surveys have not included information about their experiences with racism. The AFMC questionnaire does report on whether students have been subject to racially offensive remarks, have been denied opportunities because of their race, or received lower marks because of race.

In a field where evidence-based practice is championed, the Canadian medical community has been slow to study its own responses, or lack thereof, to anti-Black racism. For effective policies to be proposed and maintained, they need to be evaluated. For them to be evaluated, there must be data. Research into the racial make-up of Canada's medical community can help inform best practices in increasing

racial diversity among Canada's physician leaders. National medical organizations and governments are well equipped to undertake this work and fund grassroots efforts to establish more Black leaders in Canadian medicine.

Conclusion

Black Canadians are among the most severely underrepresented minority groups in medicine. The low number of Black medical students, residents, and physicians in the context of systemic racism contributes to a near absence of Black Canadian physician leaders. Recognizing this lack of racial diversity as a problem and engaging in constructive racial dialogue are the first steps toward increasing racial diversity in the Canadian medical community. Efforts must also be made to create learning and working environments that promote the emotional and physical well-being of all physicians and medical students, especially those of Black descent.

Fortunately, there have been some signs of progress. National Black medical student and physician organizations have recently been established in Canada. Medical faculties have begun proposing specific policies aimed at increasing the number of Black medical students in their classrooms. Dalhousie medical school went a step further from its affirmative action application process and, in 2019, introduced dedicated medical school seats for students from underrepresented

populations, including Black students.[20] The Cumming School of Medicine in Calgary also recently announced a new process for Black applicants.[21] Although the outcome of these actions remains to be seen, they represent a welcome commitment to addressing Black underrepresentation in Canadian medicine.

The journey to achieving racial diversity and equity is an iterative process that requires constant evaluation and redirection if necessary.

The journey to achieving racial diversity and equity is an iterative process that requires constant evaluation and redirection if necessary. Although perfect racial diversity may never be achieved, the objective is always to meet the challenge of making the next iteration more diverse than the previous. Perfecting, not perfection, is the ultimate goal. Black Canadians are brimming with talent, perspective, expertise, and excellence. The medical community in Canada suffers when it denies Black Canadians the opportunity to lead it.

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A framework for inclusive crisis leadership in health care

Javeed Sukhera, MD, Lisa Richardson, MD, Jerry M. Maniate, MD, Ming-Ka Chan, MD

In a crisis, leadership is often driven by a sense of urgency. Leaders find themselves looking inward with a narrow focus and surrounding themselves with those who share similar values and ideas. We propose an empirically informed framework for maintaining inclusive leadership and creating an environment that fosters inclusion throughout a crisis situation. Its three components are rooted in constructive tensions that inclusive leaders can leverage to bring balance, predictability, and moderation to their teams and organization.

Most leadership theory is built on predictability and moderation.[1] Crisis leadership, on the other hand, is often driven by a sense of urgency and the need for a narrow focus. Times of crisis can unintentionally precipitate and perpetuate an exclusive approach to leadership. Policies are developed quickly. Timelines are tight. Urgency drives decisions. In these situations, we tend to look inward to our "known allies" and surround ourselves with those who share similar values and ideas. Crises pose a unique challenge to the formation of diverse teams, as problems with communication and shared understanding may result from differences in status and training, as well as professional norms.[2]

Consider the example of health care leaders who have always strived to be inclusive by avoiding tokenism and seeking meaningful input from patient/family partners while developing policy. Despite their best efforts, policy decisions made quickly during a crisis have alienated their patient/family partners and eroded trust. How can such leaders adapt their inclusive leadership to times of crisis? As a group of scholars who have been involved in equity, diversity, and inclusion in both principle and practice, we propose an empirically informed framework for inclusive leadership.

A framework for inclusive leadership

Our framework is designed to guide health care leaders in maintaining inclusiveness and creating an environment that fosters inclusion throughout a crisis situation. Each component of the framework is rooted in a constructive tension that inclusive leaders can leverage to bring balance, predictability, and moderation to their teams and

Figure 1. Inclusive leadership framework

	MOTIVATION	INTERNAL ORIENTATION	EXTERNAL ORIENTATION
Fix vs feel	Is driven by values	Leads mindfully	Models psychological safety
Whole vs parts	Views diversity as strength	Recognizes and manages own biases	Co-creates opportunities for engagement
Self vs other	Practises self-care	Engages in deep listening	Practises allyship
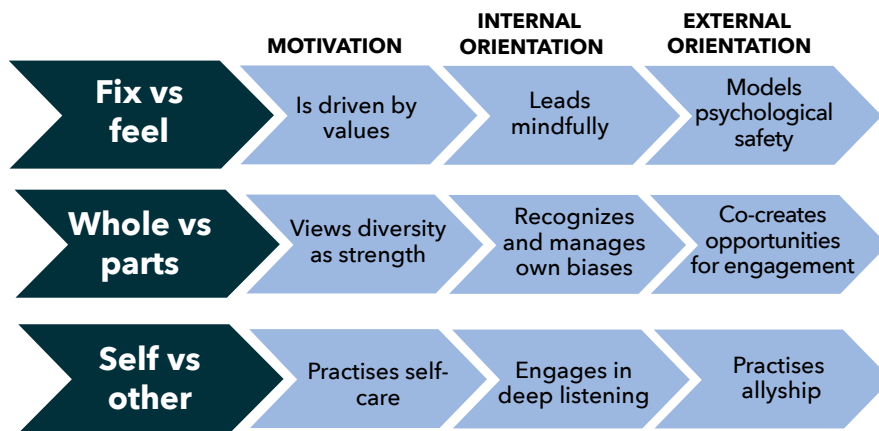
organization. We identified three such tensions: fix versus feel, whole versus parts, and self versus other (Figure 1).

Constructive tension 1: fix versus feel

When encountering a crisis, many leaders are hard wired with an implicit impulse to fix things. This response is often accentuated or even sought out during a crisis. However, inclusive leadership requires stepping back from the urge to fix and being prepared to sit with complex emotions. Moments of crisis highlight that there are many problems outside a leader's control that cannot be solved by simple fixes. Therefore, inclusive leaders can be role models by explicitly describing these moments for their team, encouraging others to share, and creating psychologically safe environments for others to experience and process heavy emotions.

Inclusive leaders should also recognize that others may cope with crises in diverse ways. There may be challenges that a leader has overcome, but with which their team members are still struggling. In these contexts, leaders are at risk of falling into the trap of toxic positivity. It can be profoundly invalidating for others to be told to have gratitude or be kind when they might be struggling to meet basic needs, in survival mode, or facing grief and loss. Sometimes, the greatest challenge for a leader is to step back and simply emphasize that they are present and truly listening and offer unconditional support. Crisis leadership is about having compassion and being able to take another's perspective.

Constructive tension 2: whole versus parts

During a crisis, our threat response becomes activated and we tend to narrow in on specific details. It can be challenging to prevent our amygdala from overriding our brain and hindering our ability to step back to distinguish "the forest from the trees." Narrow

thinking can prevent diverse ideas from being considered. Inclusive leaders can engage in active reframing for their teams. For example, a crisis can be reframed from threat to opportunity, diversity from dangerous to driving excellence, and engagement from time to presence.

Leaders can create mechanisms to ensure dialogue around complex problems while considering a wide range of possible solutions and being mindful of unintended consequences. The use of online tools to solicit engagement with teams can be useful for rapid feedback. Inclusive leaders should ask themselves if they feel the need for such activities to be anonymized or not. If a team prefers anonymity, leaders might ponder whether they are truly creating the kind of psychological safety where diverse ideas can thrive. The actions of a leader directly influence whether people on their team are willing to speak up.[3]

Team leaders are often in a unique position of being able to see a crisis situation as a whole rather than in parts.[4] Sometimes leaders have more access than other members of their team to information from those with more power and status in the organization. Inclusive leaders must find ways to bridge this divide of power and hierarchy by distributing power within their team, while not diminishing the agency and control of others. In doing so, these leaders often break down historical or organizational

silos by drawing on expertise, resources, and perspectives not usually accessed to create innovative solutions.

Constructive tension 3: self versus other

Times of crisis may make it difficult for leaders to introspect and reflect on their own performance. Leaders may also amplify self-blame and self-doubt. During a crisis, inclusive leaders should model humility and empathy for others, as well as for themselves. During any crisis, all members of the team (including the leader) are sharing the experiences of suffering and distress because of the shared nature of the crisis situation.

Another challenge in the context of a crisis is that our ability to engage in empathic listening is constrained. To maintain a sense that leadership should be collaborative and distributed, listening is simply not enough. Some listening involves confirming what we already know, some requires presence and empathy;[5] however, deep listening requires listening to what is not being said. It requires listening to the emerging story that has not yet been written.[6]

Although leadership theories emphasize the concepts of mentorship and followership, inclusive leadership requires allyship. Inclusive leaders recognize their own privilege and start their journey toward inclusion by looking in the mirror at themselves.

Conclusion

Leadership in crisis can feel like both a burden and a gift. Health care leaders are asked on a daily basis to demonstrate character and engage in critically, contextually aware judgements.[7] By understanding the challenges that arise during times of crisis, we can also identify leadership strategies that build on inclusive principles. Inclusive leadership may provide us with some guidance on what steps we need to take individually and collectively with our teams, organizations, and community at large.

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OPINION

Fourteen health care systems versus COVID-19

Are these the best systems for future health care decisions and needs?

R. Douglas Wilson, MD, MSc

COVID-19 has revealed "cracks" in Canada's health care system. Our 14 health care systems have no evidence-based process for prioritizing health care needs or services with a politically directed component. There is no real collaboration, administrative functions are duplicated, provincial borders create patient access restrictions and barriers

to collaboration around academic institutions and centres of excellence, and hospital/provincial human resource budgeting is becoming more difficult to support. Has the time come for recognition, discussion, debate, and decision about health care delivery and how it could be provided in a more cost effective, cost benefit process, for both patient and provider enhancement, for all regions of Canada?

This commentary is not about the dedicated heath care professionals at all levels of care and how they provide the best care possible. It is about the bigger national health care picture: its organization, infrastructure, decision and policy processes, human resources, and implementation of evidence-based protocols. Is there a need to have a fresh look at the delivery of health care in Canada?

COVID-19 revealed "cracks" in the present organization of the health care system. The facts that support a consideration of reorganization include:

- Provincial governments could not manage COVID-19 needs without federal support
- The federal government could not manage COVID-19 needs without provincial support
- Every day, there were multiple reports from provincial and federal politicians
- Every day, there were multiple reports from provincial and federal medical leaders
- Every day, provincial and hospital groups were doing provincial and hospital planning, in most cases, in isolation
- Every day, independent provincial health care decisions were made, on many levels
- Every day, mixed messages were received, decisions implemented, decisions withdrawn, creating large-scale confusion for the public and medical support personnel
- Some provinces appeared to have made the right decisions, while others appeared to struggle, with no real national oversight
- Large-scale national planning and triage opportunities were not available, while other important and needed health care services were delayed or cancelled

All of this activity created massive daily redundancy, with large financial, time, and human costs. There will be a next time and, yes,

the approaches to COVID-19 of the 14 health care systems will be analyzed and discussed, possibly allowing us to be better prepared, but do we need health care system processes to be done 14 different ways?

Is it time to consider a real national health care system? Has the time come for recognition, discussion, debate, and decisions about health care delivery and how to provide it in a more cost effective and cost benefit way, for both patient and provider enhancement, for all regions of Canada?

How is it going?

In 2017, the Fraser Institute[1] reported on the sustainability of health care spending in Canada and identified significant concerns:

The pressing question today, however, is what can we reasonably expect to occur in the near future in the absence of any significant shift in government policy?

After years of increasing health care spending at an unsustainable pace, it seems as though provincial governments have started to reach their limits over the past 5 years — understanding that a continuation of such increases would result in either reductions in other spending, or higher taxation, higher deficits and debt, or some combination of these three.

The Canada Health Act indicates that the roles and responsibilities for health care services are shared between provincial or territorial governments and the federal government. The provincial and territorial governments are responsible for the management, organization, and delivery of health care services for their residents.[2] The federal government is responsible for:

- Setting and administering national standards for the health care system through the Canada Health Act
- Providing funding support for provincial and territorial health care services
- Supporting the delivery of health care services to specific groups
- Providing other health-related functions

The federal government has minimal impact on the national standard of care provided, as each province or region has determined or creates its own standard of care. Health care service equity, access, quality, and safety vary significantly across the country. Federal administrative involvement and oversight is present mainly in hospital and educational accreditation processes and focused federal health care responsibilities and programs.

Shared funding support, as reported by CIHI,[2,3] has health care spending as 70% public (provincial–territorial 65.1% and other public sector 5.3%) and 30% private (out of pocket 14.1%, private insurance 12.3%, other 2.9%). Federal transfer payments are a collection of payments made by the Government of Canada to provinces and territories under the Federal-Provincial Arrangements

Act; they include the Canada Social Transfer, the Canada Health Transfer ($40.4 billion) and equalization payments (for 2019–20, the provinces and territories will receive $78.7 billion through major transfers). Considering a Canadian regional health transfer approach, the transfer payments are for Atlantic Canada ($2.6 billion), Quebec ($9.1 billion), Ontario ($15.6 billion), Western Canada ($12.9 billion), and Northern Canada ($134 million).

Canada is among the highest spenders on health care in the Organisation for Economic Co-operation and Development (OECD), at $7068 per person. Tables 1

and 2 compare OECD and provincial health care spending.[3]

Where is the budget being spent?

The exact additional cost of COVID-19 for the federal and provincial health care systems cannot be determined as yet. Reviewing pre-COVID-19 spending patterns gives us a better understanding of future budget implications.

In 2019, total health expenditures in Canada were expected to reach $264 billion or $7068 per person and, overall, health spending would represent 11.6% of Canada's gross domestic product (GDP).[3] Hospitals (26.6%), drugs (15.3%), and physician services (15.1%) were expected to continue to use the largest share of health care dollars in 2019.[3]

The growth of physician spending has outpaced that for hospitals and drugs. Here is the forecast for

Table 1. Canadian health care spending compared with other OECD countries, 2019

Country	Health care spending			
	Per capita, $	% of GDP	Public share, %	Private share, %
All OECD countries	5175	8.8	73	27
Canada	7068	10.7	70	30
United States	13722	16.9	49	51
Australia	6488	9.3	69	31
United Kingdom	5275	9.3	77	23

Source: 2019 CIHI health spending forecast.[3]
Note: OECD = Organisation for Economic Co-operation and Development.

Table 2. Comparison of health care spending among provinces

Region	Province	Health care spending, $/person
Canada		7068
Atlantic Canada	Newfoundland and Labrador	8190
	Prince Edward Island	7447
	Nova Scotia	7381
	New Brunswick	7187
Quebec	Quebec	6935
Ontario	Ontario	6953
Western Canada	Manitoba	7404
	Saskatchewan	7249
	Alberta	7658
	British Columbia	6548
Northern Canada	Yukon	11733
	Northwest Territories	17475
	Nunavut	19061

Source: 2019 CIHI health spending forecast.[3]

each category in 2019:[3]

- Hospital spending: 26.6% of total health care expenditure, $1880 per person, 2.0% annual growth per person
- Drug spending: 15.3% of total health care expenditure, $1078 per person, 1.8% annual growth per person
- Physician spending: 15.1% of total health care spending, $1064 per person, 3.5% annual growth per person; for 2018, there were 89 911 physicians in Canada, representing 241 physicians per 100 000 population[3-5]

Concerns over the sustainability of Canada's health care systems frequently involve discussion about physician compensation, drug prices, and wait times.[6] Teja et al. highlight that capital funding to support infrastructure is largely neglected in these discussions. One of their key points supports the need for a national health care process, as Canada's health system is particularly vulnerable to fluctuations in capital spending because the cycles for capital investment are longer than political cycles.

A recent series of articles titled "America's health care system is broken" has highlighted American issues, but many are systemic in Canada as well.[7]

Conclusion

For consideration and discussion of a national health care system, we need:
- Innovative new national care models and collaborative organization for optimized human resources training, enhanced national mobilization of service expertise, and provision of care with no provincial geographic exclusions.
- New national evidence-based prioritization of primary/core and innovative complex care services and more predictable human resources funding models (blended models: salary, alternative payment plan, fee for service). Although federal and provincial/territorial funding sources can provide appropriate focused evidence-based care,[4,5] the provincial/territorial health care budgets are more than 40% of total provincial budgets and may not be sustainable.
- A greater national consideration in the directed regional planning process to create and enhance the concentration of excellence with reduced health care service duplication and cost. The concept of "closer to home" may not always be affordable for all desired services.
- A national, provincial, and local research opportunity for basic science, clinical health, and social research, but through an innovative health research policy with funded protocol implementation components. Health research prioritization should be linked to the clinical care prioritization process allowing optimization for the innovation and translational knowledge outcomes.
- A discussion regarding the possibility of a national health care process, because Canada can no longer afford the present 14 regional health care system model.

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Gender disparity in academic radiology: leaky pipeline by design or default

Emaan Amin, MBBS, Tiara Safaei, Muhammad Mustafa Memon, MBBS, Emily Bretsen, Faisal Khosa, MD, MBA

Although the success rates of both female and male applicants are comparable for matching in radiology, there have been fewer practising female radiologists than men in the past decade. We discuss the gender gap in leadership positions and research productivity in subspecialties of academic radiology, radiology professional societies, and editorial boards of radiology journals. We also highlight reasons for ongoing disparity and remedial actions for achieving parity.

The percentage of women enrolled in United States medical schools has risen significantly, from 31.4% in 1982 to slightly greater than 50% in 2019.[1] Increased efforts have been made to raise awareness of women's rights and the importance of their representation in the health care workforce. Yet there is considerable gender disparity in the work status of young physicians following completion of their medical training.[2] Although half of medical school graduates are women, only 35.8% of practising physicians in the USA are women.[3] The expected time to reach gender parity in the physician workforce, despite achieving parity among medical students, remains elusive.

In 2018, women made up 54.1% of applicants for the R-1 residency match in Canada, but only 1.3% of women – compared with 4.5% of men – considered diagnostic radiology as their first-choice discipline.[4] Even though the success rates for matching in radiology are comparable for both genders, there have been fewer women practising in the discipline for over a decade.[4,5]

Pursuing gender parity specifically in academic radiology will result in a more creative and productive learning environment, promoting the specialty for prospective female radiologists. These assertions are strongly supported by other studies showing better communication and participatory decision-making with providers and patients of the same race, ethnicity, or gender.[6]

Our article summarizes recently published literature as we sought to discuss trends in gender disparity among multiple subspecialties of radiology related to such factors as research and faculty promotion. Our goal was to recommend effective interventions to promote parity.

Pursuing gender parity specifically in academic radiology will result in a more creative and productive learning environment, promoting the specialty for prospective female radiologists.

Neuroradiology

In academic neuroradiology, of 465 faculty members for whom data were available, men made up 76.9%, while women constituted only 23.0%. Furthermore, women held 24.9% of assistant professor, 23.4% of associate professor, and 21.4% of professor positions in academic institutions across Canada and the United States.[7] Only 8.2% of the 72 faculty members who held higher leadership ranks were women.[7] Based on median H-index, women

Gender Disparity

faculty members also published less and had fewer citations than men.[7]

Nuclear medicine

In academic nuclear medicine, we identified 249 faculty members, for whom academic ranks were available for only 237.[8] Of these practising faculty members, 24.4% were women while 75.6% were men.[8] Despite similar median H-indices at each academic rank, nuclear medicine faculty also exhibited a decreasing proportion of women at higher academic ranks, indicating that research productivity was not an influential factor in explaining the gender disparity at those levels.[8] It is not entirely clear whether the time lag in career progression or the

fact that women may not be promoted at the same rate as their male counterparts contributed to the lower ratio of women faculty members.

Musculoskeletal radiology

Among the 183 musculoskeletal radiology programs analyzed in this study, with 255 faculty with available academic ranks, 30.7% were women.[9] Most significantly, male dominance and leadership increased with each progressive rank.[9] In terms of academic productivity, men and women had very similar H-indices, indicating similar levels of academic achievement. However, women had to be 2.5 times more academically productive at the same rank to get promoted.[9]

Emergency radiology

Emergency radiology is a fast-paced subspecialty of radiology with opportunities for career development. Thus, it is not surprising that this specialty is considered attractive and exciting to new radiologists. Of the 99 faculty members who met the inclusion criteria for the study,[10] women constituted only 22.2%. Out of the 25 faculty members serving in leadership roles, only 12.0% were women.[10] There was no significant difference between the H-indices of men and women.[10]

Interventional radiology

Interventional radiology had the least female representation of any of the subspecialties

studied, with women making up only 9.8% of faculty members.[11] Although about a tenth of assistant and associate professors were women, women held only 5.3% of full professorships.[11] Furthermore, the percentage of women in leadership positions was comparable to overall female representation in interventional radiology: 9.9% of the 71 faculty members serving in leadership positions in this subspecialty were women.[11] Nevertheless, women and men had similar levels of academic achievement, with women having more citations than their male counterparts except at the professor rank.

Breast imaging radiology

Unlike other subspecialties, the pattern of male predominance was reversed in breast imaging radiology. Of 370 faculty members,

69.7% were women. There were more female assistant professors and associate professors than men; however, this pattern changed at the professor level, where slightly over half were men.[12] Women in breast imaging radiology had lower H-index values and fewer citations than men.[12] It has been noted that research productivity might be constrained by a discrepancy in the domestic and parenting roles between genders.[13]

Pediatric radiology

Of the radiology subspecialties studied, pediatric radiology exhibited the greatest gender parity, with a faculty composed of 46.6% women.[13] Although 54.8% of assistant professorships were held by women, there were fewer women than men at the associate professor and full professor ranks.

Among professors, only 28.6% were women. Metrics of academic performance were significantly higher for men than women across all academic ranks.[13] Among faculty members serving in leadership roles, women served in 56.8% of primary leadership roles (director, chair, division head) and 66.7% of secondary leadership roles (vice-chair, assistant/associate director).

North American radiology societies

Radiology societies followed a similar trend in terms of underrepresentation of women, with only 32.6% of committee members women.[14] Further, women held 28.0% of leadership positions.[14] Although research productivity metrics were comparable at the assistant and associate professor levels, with

increasing academic rank the representation of women on society committees decreased.[14]

Journal editorial boards of the largest international radiologic societies

A study of the editorial boards of the journals of the six largest international radiology societies found significant gender disparity, as only 19.1% of board members were women.[15] Women editorial board members were underrepresented in all institutional academic ranks and were less likely to hold a departmental leadership position.[15] Compared with women, male members had more publications overall (110 vs 65) and a higher H-index (25 vs 19).[15]

Canadian academic radiology departments

Among 932 faculty members in Canadian radiology departments, only 36% were women.[16] The gender gap increased with ascending academic rank: 41.1% of assistant professors, 31.4% of associate professors, and only 19.8% of professors were women.[16]

Steps to achieving parity

In the USA, men account for about three-quarters of the resident workforce in radiology,[17] and similar disparities have also been documented recently in academic medicine, cardiology, psychiatry, hematology-oncology, and dermatology.[18-23]

A multifaceted approach is essential to tackle the several unique challenges presented to women who pursue academic radiology.

Academic institutions

To advance parity in academic disciplines, it is essential to ensure that leadership and policymakers understand the importance of recruiting, promoting, and sponsoring underrepresented physicians. Institutions should record data on academic rank, promotion to a leadership role, and type of leadership role by gender so as to recognize and quantify disparities in advancement.[24] As in radiology, there is a considerable gender imbalance in the discipline of interventional cardiology, where only 9% of fellows were women in 2017 in the USA.[25] Barriers identified by female cardiology fellows included "old boys club" culture, sex discrimination or harassment, and lack of female role models.[25]

Surveys using a validated assessment tool should be conducted to explore reasons affecting radiologists' career advancement. Further, methods, such as focus-group sessions with female radiologists from all academic ranks, could be employed to mitigate the factors responsible for the ongoing disparity in academic rank and leadership positions. Women may also benefit from building

networks and finding guidance and mentorship.[26]

Although mentorship is often described as the most influential factor in selecting a specialty, surprisingly, a large percentage of women express dissatisfaction with mentoring practices in place.[27] In part, this can be attributed to a lack of female mentors. It is also important to gain input from mentees about their mentorship preferences to serve them better.

Academic organizations should set goals to improve gender balance in the workforce, acknowledge leadership achievements as a performance metric, ensure gender representation on leadership selection committees, and recognize and support female leaders.[26] Moreover, interventions, such as structured behavioural interviews and camouflaging of names of applicants during early screening, can help decrease bias when appointing and promoting physicians.[28] Increasing the number of women on editorial boards is associated with better gender representation of published authors in journals and the use of blinded reviews to preclude bias.[29]

A commonly cited justification for male dominance in leadership positions remains the familial obligations women often face early in their careers. These obligations, including child-rearing, make it harder for women to travel widely and attend the academic conferences that foster research and academic collaboration. Young women physicians continue to tackle the work–family conflict

by reducing their work hours at considerably greater rates than men.[30] A break from work during the early years of a physician's career can lead to disparity in compensation and promotion later.[2] Flexible and equitable family-friendly policies should be adopted, including paid childbearing leave for new parents and emergency back-up care to allow physicians to meet the needs of children and maintain balance at work.[31]

A multifaceted approach is essential to tackle the several unique challenges presented to women who pursue academic radiology. For instance, endorsement of same-sex mentorship and sponsorship programs, use of teleconferencing and teleradiology to allow women to participate in conferences remotely, as well as improved policies for family, maternity, and medical leave can help support those with familial obligations.[20,27]

Medical schools

Lack of exposure to radiology rotations in medical school discourages interest and becomes a barrier to entry into this specialty; similarly, less funding for research also adversely affects women's success in academic radiology and research.[27] Adequate exposure, mentoring, and sponsorship programs can help female medical students enter and excel in radiology, which remains a male-dominated discipline.

A drop in the percentage of women with increasing academic rank each year was observed from 2006 to 2017, indicating a lack of promotion of women radiology faculty.[32] Increased efforts should be made to achieve equitable female representation and ensure enhanced health care delivery.[33]

Furthermore, during selection for leadership positions, importance is given to academic profile, including research, grants, citations, etc., with little consideration of a track record or advocacy for equity, diversity, and inclusion.[34] Once appointed to leadership positions, those with such a record are expected to implement affirmative action and equal opportunity, but they may have little experience in this area and negligible practical knowledge. The barriers to entry are therefore increasingly being replaced with barriers to promotion. Future programs should examine whether policies are being enforced for an accommodating work plan to endorse enrollment, promotion, and retention of female faculty members and mentors.[35]

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Ecological resilience and crisis leadership in the COVID-19 pandemic
In conversation with Dr. Michael Gardam

Raphaël Kraus, MD

The COVID-19 pandemic has applied unprecedented pressure to health care systems around the globe and demanded dynamic adaptation of delivery and structure. In so doing, the pandemic has unmasked remarkable rigidity and, therefore, vulnerability in our systems. In this article, we explore concepts of systems resilience, in particular ecological resilience, and their application to crisis leadership, guided by conversation with Dr. Michael Gardam, chief of staff at Humber River Hospital, Toronto. Furthermore, we argue that resilient systems respect minimum specifications, breed innovation, and are diverse, engaged, and humble.

KEY WORDS: ecological resilience, systems resilience, complexity, health care system, leadership

As health care systems the world over bend to the continued onslaught of COVID-19, health care structure and delivery are undergoing dynamic changes. I sat down (virtually) with Dr. Michael Gardam, infectious diseases specialist and chief of staff at Humber River Hospital, Toronto, to discuss health leadership and innovation within this exceptional context. "You have to adapt," Gardam says, referencing both the individual and the medical system. "If you're not flexible, you break."

Dr. Gardam has built his career and international reputation tackling systems challenges through the lens of complexity science, expertise that he offers as a consultant to hospitals and health organizations around the globe.[1] His insights, reflected in conversational excerpts throughout this article, inspire a deeper dive into the behaviours of complex adaptive systems and their applications to health leadership, which we explore herein.

Complex systems and ecological resilience

Fundamental to a complex system's capacity for adaptation is resilience. However, not all forms of resilience are equal across systems and circumstances. "In complexity science," Dr. Gardam explains, "we talk about [ecological] resilience rather than engineering resilience. Engineering resilience, you spring right back to where you were before. [Ecological] is kind of like a tree growing against the wind – it starts growing differently because it's adapting to the pressure."

The concept of *ecological resilience* was introduced by Holling in 1973 to describe the "measure of the persistence of systems and of their ability to absorb change and disturbances and still maintain the same relationships between populations…" within natural ecosystems.[2] This is balanced with stability, fundamental to engineering resilience, which he defines as the "ability of a system to return to an equilibrium state

after a temporary disturbance; the more rapidly it returns and the less it fluctuates, the more stable it would be."[2]

Ecological resilience rejects the notion of a single state of equilibrium. Rather, it proposes the existence of multiple equilibria in a single system and "the tendency for systems to 'flip' into alternative stability domains," e.g., the transformation of a rainforest into a desert in response to changes in climate.[3] Movement between stability domains maintains structure and promotes diversity to the ultimate benefit of the system's survival.[2]

Although Holling initially described these concepts within an evolutionary framework, his ideas have since been applied to economic, organizational, and institutional structures. Moreover, he himself argued that "policies and management that apply fixed rules… lead to systems that

gradually lose resilience and suddenly break down in the face of disturbances that previously could be absorbed."[4]

The COVID-19 pandemic has unmasked the rigidity and, therefore, fragility of our health care systems. How, then, do we apply lessons of ecological resilience to the Canadian health care context in the midst of the greatest disturbance since the *Canada Health Act*? Let us examine the behaviour of resilient systems.

Resilient systems respect minimum specifications

Specifically in the health care context, ecological resilience can be described as "the magnitude of disturbance that can be absorbed before the system changes its structure in order to remain within critical thresholds" — maintaining standards of health care delivery, for instance.[3] In their seminal 2001

paper, "Complexity, leadership, and management in healthcare organisations," Plsek et al.[5] argue that creative thinking within complex adaptive systems is born of "a few, flexible, simple rules,… so called *minimum specifications*," or min specs.[6] Moreover, they propose that min specs include four foundational elements conducive to innovation: direction pointing, boundaries (or critical thresholds, as above), resources, and permissions.[5] Dr. Gardam knows their value well.

"I view the whole world [as a set of] min specs. What are the guiding principles you're going to use? Everything you do has to be true to those guiding principles."

Citing an application of min spec ideology in his leadership during the pandemic, Gardam describes a situation in which the hospital's anesthesiology team deliberated the use of powered air-purifying

respirators (PAPRs), a specialized form of personal protective equipment (PPE) employed during aerosol-generating procedures, such as endotracheal intubation.

"One of my guiding principles was [our] doctors have to feel safe…. A lot of our anesthetists were, frankly, really frightened…. So we started there. I said, 'That's the *what*, let's start talking about the *so what*.' How should we start approaching this rather than immediately jumping to a solution? Let's start chipping away at it and look at different options that are available to us. And from that, start building our approach. Rather than just [a] knee-jerk 'let's go out and buy a bunch of PAPR hoods.'"

"I had my concerns whether [PAPRs] were the right solution for them, but I also felt [that] I'm not the guy intubating, so I'm not going to choose for them. We sat down, played with PAPRs for a while, and in the end, they decided that it wasn't what they wanted. But imagine if I would have told them, 'No, you can't have them'. It would have been a disaster." Thus, allowing for organic evolution within the boundaries imposed by min specs, Dr. Gardam cultivates the natural creativity of his team.

Resilient systems breed innovation

Subsequent to Holling's introduction of the resilience conceptual framework, an evolving understanding of human and environmental interactions within

Figure 1. The renewal cycle of complex adaptive systems[9]
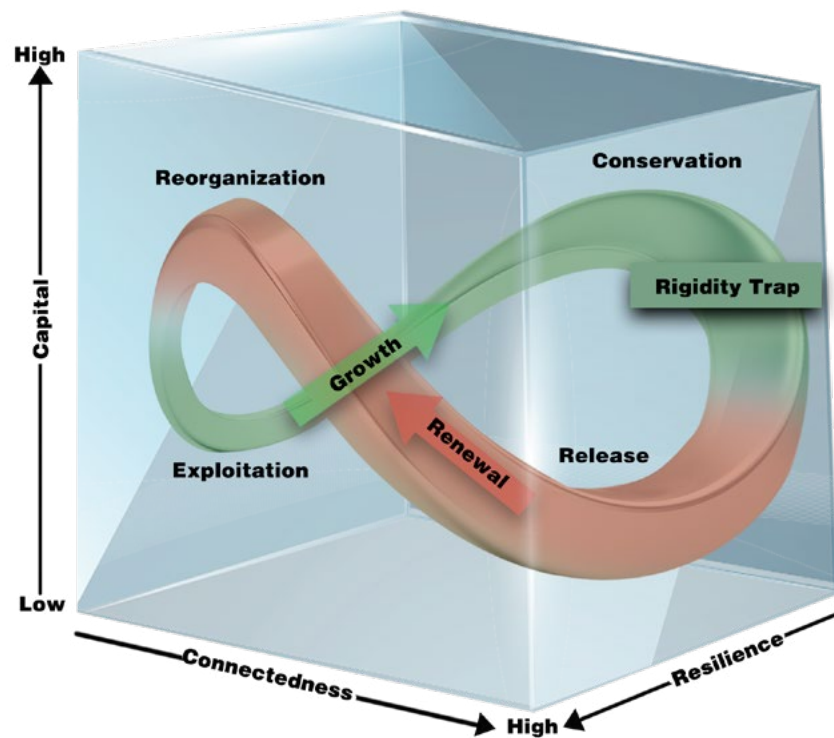
systems led to the emergence of a new concept, *socio-ecological resilience*, which puts forth the theory that systems "are in a constant state of adaptation and flux, which is determined by the human capacity to learn, innovate and adapt."[3] From this arose the *adaptive cycle metaphor*, which seeks to describe how complex adaptive systems change over time.[7] The cycle (Figure 1) is characterized by four phases that illustrate a continual, infinite process as succinctly outlined by Walker et al.[8]

The first is a phase of growth [*exploitation* or birth], characterized by readily available resources [or capital], the accumulation of structure, and high resilience. As structure and connections among system

components increase, more resources and energy are required to maintain them. The second phase [*conservation* or maturity] is, thus, one in which net growth slows and the system becomes increasingly interconnected, less flexible, and more vulnerable to external disturbances…. Disturbances lead to the next phase [*release* or creative destruction], a period of release of bound-up resources in which the accumulated structure collapses, followed by a *reorganization* phase, in which novelty can take hold, and leading eventually to another growth phase in a new cycle.

When applied to human-natural systems (health care, for example), one can substitute "innovation" for "reorganization" in the model

above. For the purposes of our discussion, we accept that the Canadian health care system is a complex adaptive system – we do not consider alternative conceptual frameworks, such as that proposed by Kurtz and Snowden[10] (the cynefin framework and its "ordered" domains of *simple* and *complicated*, "un-ordered" domains of *complex* and *chaos*, and central domain of *disorder*) that allows for transitions or oscillations between domains.[10,11]

Having served as a consultant to a number of international organizations in complex health care environments, Dr. Gardam offers a pointed perspective on health care innovation in Canada. "To me," he says, "the most obvious innovation to come out of COVID-19 has been virtual care. We've been talking about virtual care for decades. It took a very significant external event to push the system very hard. This is a classic burning platform. You can't see your patients anymore. You don't have any PPE. You're terrified you're going to get infected. And your patients still need to be cared for. What are you going to do? Within a matter of a few weeks, our whole mental health program shifted to entirely virtual."

Before COVID-19, implementation of virtual care was slow-moving. "It's why it's so difficult to have disruptive innovation, especially in Canadian health care. It's almost hard to have any innovation. We're so conservative. Governments don't like big risky projects, because if it doesn't work, it's a

scandal, rather than 'it didn't work, brush yourself off, try again.'" Here, Dr. Gardam describes a system stuck in a *rigidity trap* (Figure 1), a maladaptive departure from the adaptive cycle in which capital, connectedness, and resilience are concurrently high. That is, high resilience despite great capital and connectedness implies that the system is able to resist disturbance and persist, unchanged, "beyond the point where it is adaptive and creative."[12] Who, then, should drive health care innovation in Canada, and how might they escape the rigidity trap?

"[Doctors] have a lot of power. We're… seen as part of the system, but kind of system-adjacent. There's the health care system – and the doctors. There's the hospital – and the doctors. Even our legislation keeps us separate. Use it to your advantage. Try really different things. Don't ask for permission…. Push the envelope and get out there and try things. See where it takes you. It's easier for [doctors] to be innovative than it is for the health care system to be innovative. If we have to wait until everything is perfect, we'll never do anything."

Resilient systems are diverse

Hollins[2] further argues that, in contrast to engineering resilience and its prioritization of stability and predictability, a management approach based in principles of ecological resilience emphasizes

"the need to keep options open… and the need to emphasize heterogeneity." In other words, diversity leads to ecologically resilient systems.

"The way forward is to get groups together with divergent opinions, kicking around min specs, and then allow people to create what works for them," says Dr. Gardam. "That's the antithesis of how health care systems tend to work. Look at Ontario. Until recently, they didn't want to use a regional approach to reopening in COVID. That makes no sense. Why would you treat Thunder Bay the same as Toronto?"

"That's where I think diversity matters," he continued. "Whoever has an opinion or thinks that a given issue is important should be at that table. And it may not be the usual suspects. You need to invite the unusual suspects."

Resilient systems are engaged

At the time of our conversation, the epicentre of COVID-19 in Ontario was in the communities surrounding Humber River Hospital in northwest Toronto.

"There are clear reasons for that. It's a marginalized population. These are the frontline service workers who live in crowded conditions…. So, what's the solution to that? It's not going to come from a middle-aged, well-off white doctor like me. It's going to come from talking to the people who live there. But we don't talk to the people who live there.

We come up with government solutions in a conference room somewhere…. We need to actually engage the people who are in the middle of it."

Citing her own experiment examining the impact of racial diversity on group decision-making, Dr. Katherine W. Phillips elegantly articulates the urgent need to engage different others: "Being with similar others leads us to think we all hold the same information and share the same perspective. This perspective… is what hinders creativity and innovation."[13]

"Whatever problems we're facing," Dr. Gardam echoes, "we need to engage diverse groups. We need to listen to diverse opinions. And we need to take some risks."

Resilient systems are humble

Finally, humility is central to resilience. A management approach based on resilience does not presume sufficient knowledge; instead, resilient management recognizes its own ignorance and assumes that future events will be unexpected.[2]

"When I started doing my consulting work, I realized that me as an expert was often not helpful at all. Me as someone who listens to people and empowers them to come up with their solutions: that's where I was valuable. My knowledge was, frankly, irrelevant. That's kind of the opposite of the medical model. I'm here to facilitate. I'm here to make it okay that you guys can figure out a solution for yourselves. I'm here to make that valid. That's my leadership style. I've got some things that I need you to do [min specs], but I'm going to be very hands-off in terms of how you achieve that. I'm going to let you try things that I think won't work, but what do I know really?"

Perhaps his most poignant statement, and an apt conclusion, Dr. Gardam closed with: "I have an opinion, but that doesn't mean it's right."

Acknowledgements

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The health system is on fire — and it was predictable

Johny Van Aerde, MD, PhD

COVID-19 has created stresses in all systems, including health care, and the alignment of weaknesses has caused a syndemic. This paper describes how COVID-19 accelerated a collapse that was already in the making. Using a panarchy model, it highlights necessary changes to be made and questions what part of "normal" is worth going back to. Finally, it summarizes experiences and reflections of Canadian health care leaders revealed in interviews held during the first four months of the pandemic.

Four years ago, I wrote, "The ultimate external crisis [in the health system] can be triggered at any time by an economic collapse or a global pandemic disease."[1] COVID-19 has exposed the internal and external stresses in our human-made systems, including health, economics, and education. The simultaneous alignment of weaknesses in multiple systems has caused a syndemic. This paper describes how the present crisis was predictable and how COVID-19 accelerated a collapse that was already in the making. Using a panarchy model, it highlights necessary changes to be made and questions what part of the previous "normal" is worth going back to. Finally, it summarizes experiences and reflections derived from a series of interviews with Canadian health care leaders held during the first four months of COVID-19.

Change as renewal: the panarchy model

When a complex, adaptive system adjusts to internal and external dynamics, it follows a renewal cycle inside the three-dimensional space of the panarchy model defined by capital, connectedness, and resilience (Figure 1). Capital is the amount of material accumulated, such as biomass, physical structure, and nutrients in a forest, or physical, human, and technological

Figure 1. The renewal cycle of complex adaptive systems
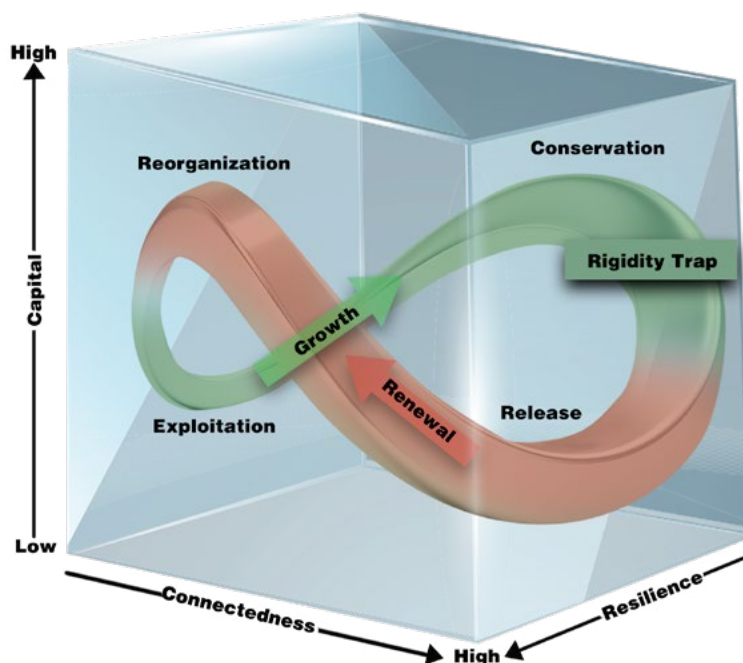
Source: Modified from Begun et al.[5]

Figure 2. Elements of health and the Canadian health care system.
The circles represent multiple, interactive complex systems at different
scales and time frames

Circle 1: Structured acute health care system
• Hospital care
• Medical care

Circle 2: Public & preventive health care
• Primary care programs & networks
• Healthy child development
• Home care
• Long-term care
• Nursing home care
• Mental health & addiction
• Palliative care
• Pharmacare
• Dental care
• Vision care
• Rehabilitation
• Physical therapy

Circle 3: Global determinants of health
• Demography (aging)
• Education
• Income & social status
• Personal health practices
• Employment
• Social environment
• Physical environment
• Inequities
• Nutrition
• Economy
• Globalization
• Climate change
• Pandemics

resources in human-made systems. Connectedness refers to the number of links or separation between agents. Resilience, the opposite of vulnerability, is the capacity of a system to adapt to change and withstand shock without catastrophic failure.[2-4]

Change can be caused by the internal dynamics and stresses of an evolving system as well as the external influences putting pressure on that system. However, before we can explore the panarchy model, we need to define the boundaries of Canadian health and health care as systems.[5]

The Canadian health system: an amalgamation of poorly connected subsystems
The boundaries of the Canadian health care systems are ill-defined except for what was laid out in the *Medical Health Act* in 1967 and further delineated in the *Canada Health Act* in 1984,[6,7] i.e., the services provided in hospitals and by physicians in hospitals and private offices (Figure 2, circle 1). The deliverables in circle 1 consume the bulk of health care budgets and only contribute in a minor way to health.[8,9] The boundaries of the community and the preventive components of the health system are much less well defined (circle 2), and the factors contributing most to health are not part of our health care system at all (circle 3).

Thus, our health care system deals mostly with disease (circle 1 and some elements of circle 2), while everything that determines health falls mostly outside the system. These multilayered subsystems, all affecting health in different ways, influence each other and are exposed to different pressures.

Stages in the panarchy cycle
There are four stages in the panarchy cycle: exploitation (birth) and conservation (maturity) in the slow portion and release or collapse (creative destruction) and reorganization (renewal) in the fast part of the cycle.[2,10] Using a forest as an example of a complex, adaptive ecosystem, like health care, the conservation stage accumulates and slowly stores energy and material (capital) resulting in a tree population with little diversity and, thus, decreased resilience, that reaches carrying capacity and stabilizes for a while (upper right part of Figure 1). Release occurs rapidly when that tree population collapses because it lacks resistance to an invasive species or disease or because of a forest fire (right side of Figure 1). After that crisis, reorganization can also occur rapidly, particularly when certain members of the tree population are selected for their genetic (innovative) ability to survive despite the external or internal pressures on the system (red part of Figure 1).

There is no beginning or end to this infinite cycle; destruction of the previous cycle forms the beginning of a new one, but at a transformed level, where many things are different and irreversible. Within the three-dimensional frame, growth toward conservation makes up the slow front portion of the cycle and represents the dominant paradigm, i.e., the way we have seen health care in Canada for the last 50 years. The fast back portion

of the cycle represents creative change and renewal.

The panarchy model describes Canada's health system: it's complex and adaptive

How we got to the upper right side of the panarchy model has been described before.[1] Briefly, after the second world war, the Canadian health care system was designed and structured to deliver acute care to a young population, for whom the almost exclusive emphasis on hospitals and physician care was sufficient. That era was followed by great medical advances, boundless promises, and ever-growing public expectations, leading to ever-expanding service options and institutions, all characterized by similar types of resources centred around technology and comprehensive hospital care. From a systemic point of view, there was no real innovation in terms of how to keep the population healthy during this growth phase.

The health care system (circle 1 of Figure 2) developed more and more connections between an increasing number of agents, leading to less and less resilience. Cumulative growth moved the system into the mature conservation phase (Figure 1) of increasing specialization and resource accumulation[3] without systemic innovation, leading to an increase in capital and more and more rigidity. The public fear of changing what is considered the only way to deliver health care and the outdated Canada Health Act itself added to the rigidity.[11,12] The vested interests of professional organizations, politicians, and

Table 1. Stresses in the health system

INTERNAL STRESSES	EXTERNAL STRESSES
Capital/accumulated resources • over-specialization • physical and human resources • increasing technology • structures, equipment > services **Rigidity** • bureaucracy • politics (short election cycle) • vested interests (medical associations, nursing unions, politicians) • federal vs provincial governments • mechanistic experts **Resilience** • Canada Health Act • change fatigue, burnout, no time • professional isolation • public perception and fear • fragmentation of care coordination	**ONGOING** • demographics (aging, high utilization) • diminishing tax base (retirement) • Individualized technology & care • consumerism (increased utilization) • more chronic diseases • clinical practices not based on evidence • ethics of pharmaceutical industry • media sensationalism • cost of human resources • expensive technology and lab tests **RECENT** • collapse of natural resource prices • global economic recession • overwhelming pandemic disease

pharmaceutical companies have further added to the loss of resilience.[13] With an increase in specialization and technology, the need to restructure and integrate the acute care system also increased, which added layers of bureaucracy, amplified the level of government involvement, and increased the degree of connectedness and rigidity even more (Table 1).

External pressures were building too (Table 1). The health care system fulfilled fewer of the needs of the changing population: an increasing number of aging baby boomers, more patients with chronic diseases, and consumers demanding more health care services. Unfortunately, there is a conflict between a publicly funded health care system and the expectation that all care must be provided to every Canadian free of charge at all times.[6] External

pressures on the acute care system arose from the increasing cost of human resources and medications, increasingly complex and expensive technology and procedures, and rising public expectations influenced by biased, sensational news reporting in social and other media. Financial pressures include reduced government revenues resulting from low natural resource prices and recession in the global economy, as well as a shrinking taxpayer base as the population ages. Finally, in 2020, the COVID-19 crisis became the latest external stressor triggering a syndemic that affected not only the health care system, but also many elements of the economic, social, judicial, and educational systems.

Stuck in the rigidity trap

Eventually, any adaptive complex system breaks down

under combined high internal stresses and external pressures, accelerated by one or another trigger, such as the COVID-19 pandemic. Like a forest fire, destruction happens quickly and is a vital step in creating a path for adaptation and innovation.[2,3,10] However, although the renewal cycle is normal in ecosystems, it is rarely acceptable in our human-made, economic, educational, health care, and political systems. Thus, people try to extend the growth portion of the cycle indefinitely and avoid the inevitable breakdown, ending up in a rigidity trap, as we did just before the pandemic. Extending the conservation phase into the rigidity trap increases the probability of an even more serious crisis as experienced today.[2,4]

Although we might have expected that the crisis would occur in acute care only, the pandemic has exposed pressures in all three circles (Figure 2). Stresses also accumulated when the health care system (circle 1) learned to displace many of its problems into the hierarchically adjacent circles (2 and 3) with their less clear boundaries.[1] The health care system became increasingly competent at managing everything within its boundaries by pushing away components it could not manage well.[1] The structured acute care system was taking up larger and larger fractions of available resources, leaving less for creativity and innovation in health-related elements outside circle 1, including primary care, home care, long-term care, prevention, and health promotion.

Creative destruction: what's left after the forest fire?

Forms and structures are necessary to deliver services, but they are not the essence of the work. The substance of health care is not the structures of hospitals and clinics or even the professions of physicians and nurses. Rather these are forms that have enabled health care work. As enablers, they are crucial, but they are not the substance of the work.[10] What does this mean for organizations or human systems, such as health care? Forms and structures that no longer support the work or mission of a system need to be abolished in a manner that does not destroy the substance of the system, which is compassionate care and serving patients and families. In Canada, this might mean the deconstruction of rigid forms and structures surrounding acute care institutions and redesign of what is needed to serve needs in circles 2 and 3, while preserving our values of fairness, equity, and compassion.

Personal mental models, cultural beliefs, and biases made people cling to the old forms and structures because they were the keys to success as the health care system was moving toward the maturity phase.[10] As a result, creative destruction appears as a threat to clinical professions, politicians, institutions, and the public. However, if led intelligently, it can become the renewal phase for a system geared toward person-centred care and community-based health.

Health care leaders, particularly physicians, need to learn this concept to ensure that the substance of health care is not lost, but renewed.

Many systemic weaknesses were hidden in the rigidity trap

Although cracks already existed before the pandemic, there are now clear fault lines in many systems affecting health: fragility of supply chains; socioeconomic inequities, including homelessness, racial inequities, gender inequities; ageism with neglect of the elderly; societal mental health issues, including substance use disorder; burnout in the health care workforce; overdue redefinition of the physician's role; lack of real patient-centred care; and lack of clarity regarding the Canadian health (care) system's purpose.

Limited pandemic preparedness
Despite signs of a pending crisis, we did not implement the recommendations emanating from the SARS outbreak or follow up on recent pandemic simulations.[14-16] That became obvious very early in the COVID-19 pandemic when shortages of medical supplies and equipment became acute as a result of weak to non-existent supply chains. "Supply chain" was not even part of the vocabulary of world leaders until COVID-19. Now the value and importance of supply chain security for health systems have a much higher profile than ever before. In the future, no country or region should be dependent on a single national

or international supply source. For Canada, the Supply Chain Advancement Network (SCAN) in Health is one of the leaders in this development.[17] There is also evidence that coordination of supplies and equipment has been easier in provinces with integrated health care systems.

Inequities exposed

The pandemic didn't create inequity, it just made the gaps bigger. Although the initial slogan was "We are in this together," it soon became obvious that although we were all in the same storm, we were in different boats. People living in the poorest neighborhoods, often in overcrowded housing, showed the worst rates of COVID-19 infections.[18,19] Marginalized youth and families will need ongoing support so that, now and in the foreseeable future, COVID-19 does not create what the United Nations has termed "a lost generation of young people."[20] The homeless are at even higher risk of infection with severe COVID-19 disease, re-emphasizing the importance of housing as a social determinant of health.[21] It is uncertain whether the explosion of protests against racial discrimination would have happened at this time anyway or whether it was triggered by the pent-up emotions of isolation, uncertainty, fear of the pandemic, but the fact is that major societal inequities affecting health will need to addressed as part of the renewal part of the panarchy cycle.

Gender inequity, overall and in medicine, has come to the forefront again, with women bearing the brunt of household duties and childcare as people retreated into their homes.[22] Although many blamed the closure of schools and childcare centres for creating gender inequities, other cultural biases might lie even deeper. Over the ages, our mental models and culture have evolved into a family structure with responsibilities based on maternal caring and nurturing. Do we need to change those mental models? However, that same maternal trait of caring, together with other traditional feminine leadership attributes, such as compassion, humility, and vulnerability, also contributed to the success of women-led countries like New Zealand, Taiwan, and Germany in dealing with COVID-19.[23]

Ageism and long-term care

The mortality of the elderly in long-term care facilities is high.[24] Lessons on complexity in health care systems have repeatedly used the example of overcrowding of ER and acute beds because of a lack of beds in long-term care facilities and nursing homes. This is an example of an unclear boundary between circles 1 and 2 in Figure 1. The ongoing shortage of beds, understaffing with overworked care providers, and insufficient funds were the underlying causes for the collapse of the long-term care system, triggered by the pandemic. Will the pandemic force Canada to integrate more elements of circles 2 and 3 into the universal health care system, or will it continue to hide behind health acts that don't include long-term and elderly care?

Mental health

Societal mental health issues, including substance use disorder, were already rampant before the crisis, and there are signs that they are increasing. Among health care professionals, 25–50% of nurses and physicians showed signs of burnout before the pandemic. What will be the effect on those with increased workloads[25] and others who have lost work and income because of the pandemic?

Changing roles, purpose, and care delivery

It is questionable whether we were practising real patient-centred care before the pandemic. Over the last years, care has been system-centred. The current crisis creates an opportunity to make the system work for patients. In our interviews, it was noted that the patient relationship with the health system has changed over the last six months, and it is likely that patients will no longer come to the "centre of excellence" at the top of the hill.

The use of virtual care, which has been very slow to be adopted, suddenly accelerated to the satisfaction of patients.[26] Virtual care might relieve after-hours pressure on ERs. It also adds convenience for patients, who do not need to travel or wait in an uncomfortable office or ER environment. The sense of urgency and perceived shortage of time frequently experienced during an office visit can be replaced by informative conversations after electronic preparation beforehand. For the health professional, online interaction allows insight into where and how the patient lives. At the same time, the patient "owns" part of the electronic meeting space, unlike during face-to-face

Table 2. Leadership attributes and values most used* by leaders during the COVID-19 pandemic

Leadership trait or value	LEADS domain
• Honesty, openness, transparency • Authenticity and integrity • Courage (to be creative, make mistakes, and learn) • Optimism, positivity, humour, faith • Flexibility (as the environment changes)	Lead self
• Communication skills and transparent information-sharing • Listening • Distributed leadership/collaboration	Engage others
• None mentioned more than once; implied goals were to minimize COVID spread and deaths	Achieve results
• Caring (serve customers) • Distributed leadership/collaboration (purposeful across regions) • Transparent information-sharing	Develop coalitions
• Creativity and innovation • Agility to lead (in different systems and changing environment)	Systems transformation

*Mentioned in at least 3 interviews

office visits. Patients indicate that they don't miss the "healing touch" most of the time. Finally, virtual care will be particularly helpful for community-centred care and wellness, for some follow-up visits of patients with chronic ailments, and for non-acute or non-surgical visits not requiring physical examination.[27]

The major shifts imposed by the crisis, the changing patient–physician relationship, the presence of virtual care, and the shifting balance between acute and community care indicate that redefining the physician's role is long overdue. The time has come to define the purpose of the Canadian health (care) system, which was never clear and certainly has not kept up with changes in the last half-century.

Will we instead fall back into the panic–neglect cycle, in which crises trigger waves of attention and funding that quickly dissipate once the crisis recedes?

Experiences during the pandemic: interviews with Canadian health leaders

During the first four months of the pandemic, we interviewed 18 health system leaders: leaders in patient advocacy, virtual care, supply chain management, medical students, and physicians who are a CEO, a minister of health, an astronaut, an innovator, and more. These talks highlighted opportunities and concerns caused by the crisis. (The full interviews are available as podcasts: **https://physicianleaders. ca/podcasts.html.**)

Although the creative destruction phase of the panarchy cycle creates opportunities for the system, for people it brings uncertainty. Good leadership thrives in uncertainty by recognizing that the challenge is to support people and to be agile in exploring possibilities in the renewal phase. Our interviews highlighted leadership qualities important in the current crisis, as well as opportunities, ongoing changes, and concerns, some resonating with the phase of renewal and innovation of the panarchy model.

Leadership traits that are vital during crisis
The leadership attributes and values deemed most useful during the pandemic (i.e., mentioned in at least three interviews) are listed by LEADS domain[28] in Table 2.

Communication skills were mentioned in every interview. Listening, both interpersonally and strategically, was seen as vital, not only for building empathy and compassion, but also for gathering information from others. Many interpersonal traits mentioned fall under the LEADS domains of Leads self and Engage others; fewer strategic abilities fall under the Develop coalitions and Systems transformation domains. Although all interviewees implied that prevention of disease and low mortality are results to be achieved, no specific leadership traits for Achieve results were mentioned more than once.

Emotional factors influence decisions

During a crisis, particularly a long one, leadership can be a lonely journey. That feeling can be attenuated by reaching out, by being kind to self and others, and by creating trust and psychological safety among peers and team members. Loneliness is further aggravated by feelings of guilt – guilt toward self for not doing enough, toward peers over shortage of necessary resources, toward family for fear of bringing home the disease, and toward patients for not being able to offer what should be offered.

Some leaders mentioned that the guilt feeling can be influenced by our response to the situation. Each of us has a choice between feeling victimized by external conditions or learning what we can control and not control.[29] In rapidly changing situations, leaders require courage to implement the best possible decision in the face of uncertainty that comes with incomplete or even erroneous data and limited resources. Accepting that we do the best we can with what we have in different situations requires us to be kind to ourselves.

Distributed leadership builds collaboration

Many interviewees talked about the need to practise distributed leadership and collaboration, not only to further reduce the feelings of loneliness and guilt, but also to build trust and help with information gathering. Despite practising distributed leadership, the leader might sometimes appear to use a command-and-control style in making decisions; however, by the time a particular decision is made, the leader often has filtered extensive advice and evidence obtained from the diversity of the team or organization. In certain crisis situations, the apparent decisiveness or perception of command and control is needed to sway the day.

Psychological safety and trust inspire innovation

Almost all interviewees stressed that evidence is often incomplete or partly incorrect. As a result, mistakes are made and decisions need to be revised. This is all part of the normal learning and improvement cycle. It was also said that failure and mistakes are not accepted in the health care system and not tolerated by the medical profession. This risk-adverse culture might work against offering creative ideas during crises, thereby attenuating the chance to discover innovative solutions. In the current crisis, to change that culture and allow people to be creative by learning from mistakes, leaders must create psychological safety within their teams, the organization, and throughout the system.

It was also noted that building trust is difficult during the collapse phase of the panarchy cycle, and that organizations should create psychological safety and trust beforehand to better weather crises. Some organizations had also prepared their physician leaders in advance by adopting structured leadership development. By investing in advance and by cultivating a trusting leadership presence before the crisis, some organizations created the necessary psychological safety to make leading easier in times of uncertainty. In that kind of environment, leaders themselves also felt supported by the organization to make decisions and take action in the face of uncertainty.

Values lead change

In times of uncertainty and chaos, core values are our main compass keeping us true to ourselves and who we are. Many mentioned that leaders need the agility and flexibility to apply different leadership and decision-making styles depending on the situation in a rapidly changing environment. That includes being skilled at zooming out systemically, and zooming in to take specific action.[30]

Although core values are the compass for individual leaders,

the quadruple aim[31] provides four pillars against which health care systems are evaluated. Some interviewees clarified how the quadruple aim is faring during COVID-19. *Better care* was initially reduced to minimizing mortality from COVID-19. Accelerating the acceptance of virtual care has improved care, but closure of large sections of hospitals has jeopardized care for "regular" diseases. Will the ongoing changes in care delivery give us better care?

The cracks in the health system exposed by the pandemic show that, in the future, *better outcomes* will necessitate action in many areas outside the traditional health care system. Currently, it means improving outcomes in long-term care facilities. In future analyses, we might see that the outcomes of "regular" pathology deteriorated during the pandemic, including mental illness. In general, we are doing poorly in achieving this aim, now and in the future.

Lower cost is not a priority right now, but deserves our attention. How the huge financial losses will affect overall investment and distribution across health, health care, and other elements of our society remains to be seen.

Well-being of health care workers is a systems value that was already being ignored before the pandemic. For now, leaders can reduce the fear of uncertainty, create psychological safety, and build trust until more permanent structural and cultural systemic changes can be introduced.[32]

The Dalai Lama's[33] first two principles of ethical strategies can guide us in redesigning the health system after the pandemic: "Let's ensure that compassion is the motivation" and "Any problem must take into account the big picture and long-term consequences rather than short-term feasibility."

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Re-thinking conferences in medicine: opportunities and challenges of virtual delivery

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As the COVID-19 pandemic underscores the need for physical distancing, an opportunity to reimagine conference design and delivery has emerged. Conferences should consider widespread adoption of virtual strategies to support professional connection and knowledge exchange driven by thoughtful design and implementation. Although virtual conferences represent a significant paradigm shift, opportunities to improve systemic inclusivity, increase financial accessibility, reduce environmental impact, and increase engagement and interactivity present compelling arguments for change. Challenges include minimizing digital exclusion, providing technical support, supporting participant wellness, and facilitating opportunities for networking. We reflect on these themes through experiences and lessons learned when transitioning the inaugural Conference on Health Advocacy Toronto to a virtual model during the COVID-19 pandemic.

Accelerated adoption of virtual communications will be a legacy of the COVID-19 pandemic. As physical distancing measures preclude us from large in-person meetings, many academic conferences have been cancelled or postponed. Although we must act collectively to "flatten the curve," virtual conference design and delivery emerges as a promising and enduring approach to supporting professional connection and idea sharing. Experiences have been positive so far: more than 80% of attendees of a recent virtual conference were willing to attend another one in the future.[1]

Recently, the Conference on Health Advocacy Toronto (CHAT)[2] fully transitioned from an in-person meeting in Toronto to a virtual forum within two weeks. CHAT was launched by University of Toronto medical students to highlight initiative- and research-based advocacy at the local, provincial, and national levels.[3] This grassroots academic forum brought together almost 200 medical students, students in allied health programs, and physician leaders from across the country to establish a community of support, share best practices, and identify opportunities for collaboration.

Here we discuss the opportunities and challenges of virtual conferences informed by our personal experience and broader consideration of pertinent literature.

Opportunities

Accessible costs

Virtual conferences are markedly
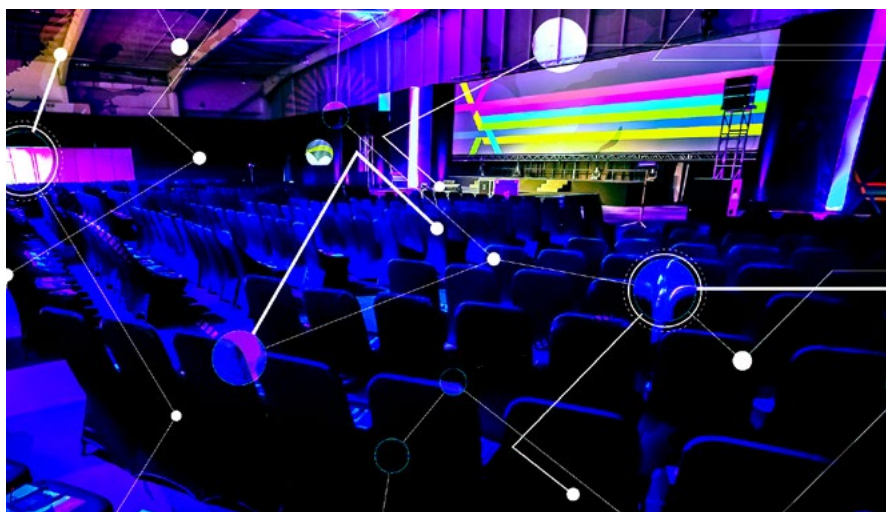
less cost-prohibitive than physical meetings. Many virtual conferencing platforms, including Zoom, Cisco WebEx, Google Hangouts, and Skype, have basic packages that are available free-of-charge. Expanded features required for larger meetings, such as hosting more than 100 attendees, may require payment of a monthly, but still cost-friendly, subscription fee. For example, CHAT 2020 spent less than $200 for two virtual conferencing packages that allowed a maximum of 500 participants. In comparison, upwards of $5000 is needed for a 100-participant in-person meeting with estimates of $1000 for the venue rental fee and $4000 in food expenses. These significant cost-savings can be transferred to the sponsors and attendees so that registration fees for various major conferences can be reduced or waived.[4,5] A low cost also makes the conference financially viable at a broad range of registrant volumes, thus providing certainty to the conference team early in the planning process.

Further, there are no added costs for participants to physically attend a virtual meeting, such as travel, accommodation, food, or poster-printing expenses that could otherwise add up to hundreds or thousands of dollars across the group.

Systemic inclusion

Virtual conferences not only increase financial inclusion, but also break down geographic, health, and social barriers. Current in-person conference design may be a systemic barrier that excludes certain groups, including people with physical disabilities,[6] acute or chronic health considerations, travel restrictions, or caregiving responsibilities.[7,8] Women are disproportionately affected by family inclusion policies, which vary among medical conferences; dedicated lactation spaces, free childcare, and admission of children into conference venues is often not available.[9] Allowing participants to attend virtually, from the comfort of their selected space, presents a solution that addresses these barriers and aligns with objectives to achieve equitable representation in academia. Conference attendance has critical implications for career

advancement, professional networking and mentorship, and knowledge sharing. Using virtual technology as a vehicle to improve accessibility at professional academic forums is a strategic move toward fostering diversity and inclusion in medicine.

Environmental savings

Virtual conference delivery is eco-friendly. The adverse consequences of climate change on health are widely recognized and, as leaders in our communities, physicians should take action in environmental stewardship and emission reduction. Given their substantial environmental footprint, conferences should not be exempted.[10-13] Event materials, such as printed programs, conference merchandise, non-reusable dining utensils, and uneaten food, result in unnecessary added waste. In addition, frequent work-related air travel among ecologists and conservation scientists has been shown to be associated with carbon footprints 10 times the global average.[14] Conferences have an inherent role in facilitating career advancement, but increased air travel has been shown to not be associated with academic productivity in terms of H-index.[15]

Frameworks to design greener conferences have been developed. The Nearly Carbon-Neutral conference model[16] is one approach that recommends prerecorded talks with interactive online discussion over a 2–3 week period. This model produces less than 1% of greenhouse gas emissions of traditional fly-in conferences. During the COVID-19

pandemic, webinar models via videoconferencing software have emerged as another popular approach. At CHAT, the move to a virtual interactive seminar model eliminated printing needs and food catering and minimized any need for air or ground travel to a physical venue.

Elevated engagement

Hosting a virtual conference holds great potential to increase engagement and attendance. For CHAT, registration volume increased 4.5-fold after the announcement that it would be adapted to a virtual format. Major international conferences have also seen registrations soar.[17] Virtual delivery expands the breadth of interest and expertise in attendance, which can allow for richer discussions and more satisfying networking opportunities.

Harnessing interactivity

Virtual conferences can be delivered interactively. Novel approaches to engage participants can be harnessed to stimulate conversation, networking, and connections. Video conferencing platforms allow for group discussions via video, audio, and chat functions. Likewise, groups can be divided into breakout rooms or separate meetings to facilitate more intimate, focused conversations.

Setting an interactive tone and encouraging video participation are important ways to engage participants in a virtual setting. In an email sent to guests before CHAT, we asked them to consider enabling their audio and video for a full, interactive experience. We also addressed possible participant anxieties over participation, including conference dress code in a virtual setting, and highlighted the opportunity to use virtual backgrounds if desired. Our opening keynote speaker also encouraged interactivity by asking participants to contribute ideas and experiences verbally or through the chat box.

Approachable poster sessions

The traditional conference poster session can be greatly improved with virtual delivery.

Many conferences typically include a large volume of poster presentations in condensed sessions set in large, noisy, busy halls – a challenging environment for participants to navigate. At CHAT, we adapted the poster session to take place in virtual "breakout rooms" with a variety of research and advocacy initiative presentations in each room. Presenters were scheduled a specific time to present their project followed by a moderated question-and-answer period.

Rather than printing expensive single-use posters, presenters produced slide decks that were displayed via the screen-sharing function on our conferencing platform. Slide decks can also be uploaded to an online repository where the audience can download and view them on their screens.

At CHAT, despite more than 40 slide decks and speakers, clear instructions at the beginning of each session and the availability of a preconference audiovisual check allowed for smooth transitions throughout the conference with minimal technical challenges.

Flexible document sharing

Cloud storage, widely recognized and accessible to participants, can be leveraged to support virtual conference delivery. A conference "drive" on Google Drive, Dropbox, or other open-access cloud system can be distributed to participants with changes made in real time, allowing the organizing committee the flexibility to make last-minute program changes,

modify schedules, and share resources in real-time. Collection and dissemination of contact information among participants is also possible.

For CHAT 2020, we created a conference drive that included the conference program, presentation schedules, and conference meeting links. Feedback forms and online resources shared by attendees could also be easily accessed after the conference, enabling longitudinal communication and knowledge sharing. We displayed web links to this drive and associated QR codes at the start of each session for easy access. We also created a second drive for presentation judges only, which included a modifiable scoring spreadsheet and presentation rubric. Judging scores were inputted in real time directly onto this spreadsheet. This allowed for a quick turnaround time of only a few minutes to announce the competition winners after the conclusion of the last presentation session.

Challenges

Virtual conferences represent a novel approach with many opportunities. Although there are challenges, they are surmountable with careful planning.

Minimizing digital exclusion and providing technical support

As not all participants may be comfortable using a virtual platform, digital exclusion may be a barrier to access.[18,19] The COVID-19 situation has challenged

academics and physician leaders across the world to familiarize themselves with virtual tools.[20] Although use is broadly increasing, CHAT 2020 was the first time some participants used our conferencing platform. To address this, an instructional package was emailed before the conference and a primer was provided at the beginning, during opening remarks, in anticipation of possible technical concerns during the day.

Despite best efforts, virtual conferencing may still be affected by technical issues, such as muted microphones, malfunctioning cameras, low Internet bandwidth, or platform crashing. These issues can be mitigated by having a telephone (dial-in) option as an alternative to a poor Internet connection, having multiple team members available for back-up to take over moderating and other event-management tasks, and having a dedicated audiovisual check for participants and presenters before the conference start time. At CHAT, we also had a dedicated IT lead to whom participants could reach out privately to resolve IT challenges.

Facilitating networking and unstructured conversation

The temptation to structure all components of a virtual conference can limit self-directed opportunities for informal discussion, which is an important benefit of physical meetings. However, organizers can facilitate small breakout sessions that allow for unstructured conversations. As participants get more comfortable with virtual sessions, there may be interest and acceptance

of virtual breakout groups for mealtime, allowing informal dialogue among colleagues. In addition, encouraging use of the text chat function, which can be used for whole group or private conversations, may allow discussion to continue throughout the conference.

Supporting virtual wellness

In recent months, increased reliance on virtual tools for professional and social communication has precipitated widespread wellness concerns related to "Zoom fatigue."[21] Physician wellness is a national priority: the Canadian Medical Association's 2019 data show that one in three Canadian physicians is experiencing burnout and more than one in three screen positive for depression.[22]

Principles of design thinking should be applied when developing virtual conferences. Thoughtful consideration of flexible programming, event duration, and rest breaks are strategies to promote engagement and wellness. During CHAT, we incorporated a few structured breaks into the program, but also recognized that participants might wish to take additional breaks throughout the day. We limited the conference duration to less than six hours and encouraged participants to join for as much of the program as they were able to but normalized the option to take additional breaks if required.

Coordinating schedules

Timing of a real-time event is an important consideration, as participants may be located in

multiple time zones. However, virtual conferences allow sessions to be recorded (with the consent of presenters) and watched at a later time. One conference, designed under a flipped classroom model, pre-uploaded recorded talks, and participants joined an online conversation afterward to discuss the content.[23]

Conclusion

In-person conferences have been the norm in medicine for many years. However, technological innovations allow academic collaboration to be more resilient against the constraints of physical distancing. With likely gains in equitable and inclusive access, it is time to consider the opportunities for virtual conferences in medicine.

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Dr. Shaw commenced working for the College of Physicians and Surgeons of Saskatchewan in a contract position working within the complaints process for several years, before being named Deputy Registrar in 2001. She held that position until she became the Registrar on July 1, 2011, a position which she still holds.

In addition to being involved in the regulation of medicine at the provincial level, Dr. Shaw has been involved at the national level in the work of the Federation of Medical Regulatory Authorities of Canada (FMRAC) as a Member at Large, President elect and as President (2002) and is now currently a Board Director.

Dr. Shaw has been heavily involved in the work of the Medical Council of Canada (MCC) as a Board member and served as President for an extended period of three years from 2015-2018. Dr. Shaw was also a member of the Steering Committee of the National Assessment Collaboration Practice Ready Assessment project for foreign trained family physicians, internists and psychiatrists, which has influenced the integration of foreign trained family physicians through the SIPPA program in the province.

Dr. Shaw also finds time to work collaboratively with other regulatory organizations across the province and the country on mutual issues pertaining to health care in Saskatchewan. Dr. Shaw is always willing and available to provide presentations to medical students. Each year she provides presentations to year 1 through to year 3 students on a number of topics including "maintaining professional boundaries with patients", "the regulation of medicine in Saskatchewan", "professionalism in medicine", and many more topics all aimed at ensuring that our future medical professionals are aware of their ethical responsibilities in being privileged to practice medicine.

A few excerpts from her letters of recommendation…

Dr. Shaw has a keen interest in physician health issues, and quality improvement practices as they relate to maintaining competency throughout a physician's career and aims to address these in her remaining time as Registrar of the College of Physicians and Surgeons of Saskatchewan.

I believe that Dr. Karen Shaw is arguably one of the most influential physician leaders in Saskatchewan today. Her professional work with many provincial and national organizations is outstanding and her leadership is a testament to the hard work and dedication she has given to the field of health care over her career spanning 35+ years to date.

Dr. Brian Brownbridge
President
College of Physicians and Surgeons of Saskatchewan

It is with great pleasure that I write in support of Dr. Karen Shaw's nomination for the Chris Carruthers Award of the Canadian Society of Physician Leaders. I have known Dr. Shaw for 20 years. She is a strong and trusted figure in the world of medical regulation, both in Canada and on the international scene. Professional regulators are not born, they are made. She has led neophyte Council members through a careful and thoughtful approach on their way to becoming familiar with the intricacies of the job at hand. As a result, the College of Physicians and Surgeons of Saskatchewan is a good example of a well-functioning, adaptive and modern authority.

Fleur-Ange Lefebvre
Executive Director and Chief Executive Officer
Federation of Medical Regulatory Authorities of Canada

Congratulations CCPE Recipients 2020

Dr. Tanis Adey
Associate Dean, Undergraduate Medical Education, Memorial University of Newfoundland / Associate Professor, Memorial University of Newfoundland St. John's, NL

Dr. Darren Cargill
Medical Director & Lead Physician, Hospice of Windsor Palliative Medicine Program / Past Chair, OMA Section of Palliative Medicine, Windsor, ON

Dr. Andrew Downes
Surgeon General / Commander Canadian Forces Health Services Group / Former Vice-Chair, Area of Focused Competence – Aerospace Medicine, RCPSC Ottawa, ON

Dr. John Fuller
Medical Director Perioperative Care, St. Joseph's Health Care London / Professor, Dept of Anesthesia & Perioperative Medicine and Dept of Medicine, Critical Care, Western University London, ON

Dr. Kevin Fung
Chair/Chief, Department of Otolaryngology – Head and Neck Surgery, Schulich School of Medicine and Dentistry, Western University, London, ON

Dr. Neil Gibson
Associate Zone Medical Director, Acute Care Coverage, Edmonton Zone, Alberta Health Services / Past-President, Canadian Society of Internal Medicine Sturgeon County, AB

Dr. Gordon R. Giddings
Medical Lead and Senior Medical Advisor, CCPSA, Departments of Accreditation and Professional Conduct / Lead Scientific Consultant and Editor, Pallium Canada, Edmonton, AB

Dr. Anders Ganstal
Regional Medical Director, BC Emergency Health Services, Interior / Clinical Assistant Professor, UBC, Department of Emergency Medicine Kamloops, BC

Dr. Haissam Haddad
Professor and Head, Department of Medicine, University of Saskatchewan / Louis Horlick Chair in Medicine / Provincial Head, Medicine, Saskatoon, SK

Dr. Sarah Jarmain
Past Chair MAC, St. Joseph's
Health Care London / Associate
Professor, Department of
Psychiatry, Schulich School of
Medicine and Dentistry, Western
University, London, ON

Dr. Scott Malcolm
Director of Health Services
Operations, Canadian Forces
Health Services Group
Greely, ON

Dr. Jim Ruiter
Medical Director and Vice
President, Salus Global
London, ON

Dr. Linda Mrkonjic
Past President, Calgary and Area
Medical Staff Society / Medical
Lead, Safe Clinical Practice
Program, Foothills Medical Centre
Calgary, AB

Dr. Olubunmi Oyebanji
Medical Director, Bethany Care
Society / Site Lead Medical, Alberta
Health Services, Calgary, AB

Dr. Vivien Suttorp
Lead Medical Officer of Health,
South Zone, AHS / Clinical
Consultant Workplace Health and
Safety, South Zone, AHS
Lethbridge, AB

Dr. Mehaboob Shariff Shaik
Facility Chief, Child Health / Facility
Section Head, Neonatal Intensive
Care Unit, Misericordia Community
Hospital, Edmonton, AB

Dr. Kent Stobart
Vice Dean Education / Professor
of Pediatrics, College of Medicine,
University of Saskatchewan /
President, Canadian Association
for Medical Education
Saskatoon, SK

Dr. Susan Ulan
Deputy Registrar & Hearings
Director, College of Physicians
and Surgeons Alberta / Member,
Provincial Practitioner Executive
Committee Workforce Plan,
Edmonton, AB

Dr. Kevin Wasko
Physician Executive, Integrated
Rural Health, Saskatchewan Health
Authority, Swift Current, SK

BOOK REVIEW

Stay tuned for the next issue and reviews of several physician leadership books released in 2020, including the new edition of the LEADS textbook, on which the Canadian Certified Physician Executive (CCPE) designation is based (**www.leadsglobal.ca/buy-book/**).

The book chronicles the evidence base for LEADS and how LEADS is used in Canada and other national jurisdictions to support leadership talent management. It profiles many examples of how the framework has been put to work to improve health service delivery. It also provides some thought-provoking ideas about the importance of national leadership development. For more, see the next issue of *CJPL*.

Bringing Leadership to Life in Health: LEADS in a Caring Environment

Putting LEADS to work

Graham Dickson
Bill Tholl
Editors

Second Edition

Springer
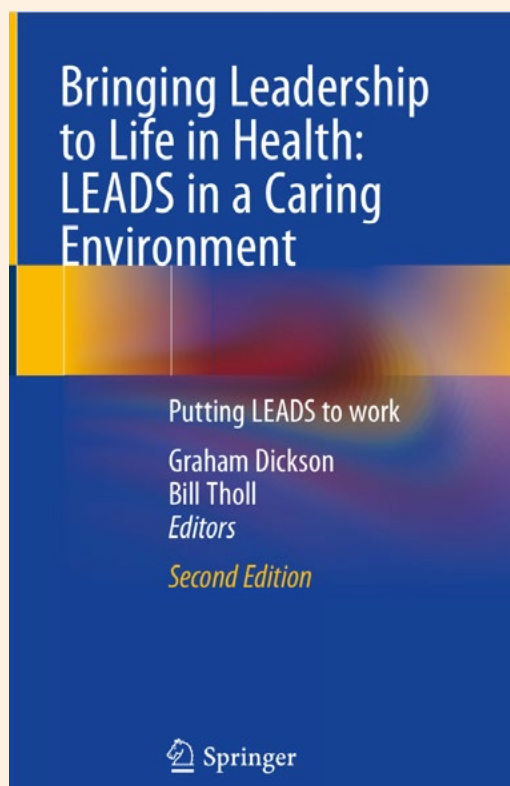
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