THE
BREAKTHROUGH
CONFERENCE

REIMAGINING EDUCATION FOR DOCTORS

REPORT CONTENTS

BACKGROUND

Medical educators have always needed to anticipate the future and design appropriate curricula to ensure that future generations of doctors will have the necessary skills to practice effectively. Previously, however, the educational needs of the doctor of the future were more consistent with the knowledge and skills of the doctor of the present. This is changing. Today's medical educators are operating in a rapidly shifting environment where technology, research, and other developments require them to think about education differently than their predecessors. To share medical knowledge with students is no longer enough, we must now also consider what we do not know, anticipate future healthcare trends and determine the best way to educate future physicians for practice in a world that will likely be markedly different from the one we currently practice in.

The University of Toronto has one of the top medical schools in North America. To stay on the cutting edge, we have to continue to ask questions differently. We must constantly adapt and evolve. This requires self-reflection and an open-mind: including exploring how medical education can learn from other disciplines.

To this end, on May 8, 2015 the *Breakthrough Conference* was hosted by the Department of Family and Community Medicine (DFCM), at the University of Toronto (U of T), to explore how a "think lab" comprised of both insiders and outsiders of the medical education system might spur innovative methods for how our future doctors are educated. Dr. Kymm Feldman, former Program Director for Undergraduate Medicine at the DFCM, had the idea for the conference after hearing about similar types of 'outsider' consultations in other fields.

Innovation often stems from challenging the assumptions that constrain our thinking and experiences. Sometimes innovation is also sparked by the limits that are inherent in a system. One way to identify and challenge limits is to bring in individuals from outside the system to critique the assumed norms. Outsiders have the ability to provide a fresh perspective—a different way of seeing the world—and therefore may offer approaches and tools for addressing challenges that fall outside of the traditional methods used by those who are steeped inside the "norms" and assumptions of a given cultural, business, or educational context.

Medical student education has and continues to undergo substantive change since the reforms stimulated by the Flexner Report. Traditional assumptions like medical school must be four years and lecture based versus three years and problem based; medical school is goal/objective based versus competency based; medical students must learn the basic sciences first versus

Imagine. Invent. Disrupt.

concurrent clinical knowledge; clerkship rotations must be separate and distinct versus integrated; have been successfully challenged and have given rise to new curriculum and evaluation methods (Ogur 2007; Gaufberg 2014; Hales 2012).

There are still many challenges in medical education which need to be explored. By engaging the outsider perspective, It was hypothesized that some of the current issues may be explored, defined, and effectively addressed if the right combination of people from diverse backgrounds were brought together to consider them. It was from these principles and strategies that the *Breakthrough Conference* was formed. Medical education is due for a "breakthrough".

METHODS

Seventy-three participants from both inside and outside of the medical education field at the University of Toronto were selected to participate in the Breakthrough Conference by special invitation (**Appendix A**). A snowball technique was used beginning with interviews with prominent U of T medical education insiders to identify participants. Professional profile searches were conducted and provided detailed information into recommended participants in fields outside of medical education prior to requesting participation. Outsider attendees included leaders in medical education from outside U of T, as well as leaders from diverse fields, such as technology, business, and the arts. Insiders

Photo Credit: Brian Da Silva

included leaders in medical education, medical students, and residents from within U of T. Some attendees fell into multiple categories. A full list of the areas of expertise of all attendees can be seen in **Table 1**.

Attendee Professions / Areas of Expertise

Health professions education faculty
Scientists
Entrepreneurs
IT specialists
Designers
Artists
Activists
Medical Residents
TV Producer
Philosophers
Psychologists
Economist
Business school faculty
Researchers
Pilot
Musicians
Inventors
App builders
Educators
Journalists
Medical students
Marketing
Communications strategists

Table 1. *Attendee Areas of Expertise*

In an effort to provide non-medical outsiders with enough background and context to use as a starting point for understanding the current state of medical education—and by extension the limitations that exist within—brief talks were given by insiders to situate all participants in current discourse.

The conference opened with an introduction by the former Chair of the DFCM, now Vice Dean, Partnerships for the Faculty of Medicine, Dr. Lynn Wilson. Dr. Kymm Feldman, the former Director of Undergraduate Medical Education (DFCM) gave opening remarks, speaking about curricular design, and the possibility of using conference recommendations to develop seed projects within the medical school at U of T. Dr. Jay Rosenfeld, Vice-Dean, Undergraduate Medical Professions Education, presented on the current trends in healthcare and the significant pressures for a change in how medical education is delivered, including the Future of Medical Education in Canada (FMEC) project and the current priorities of Undergraduate Medical Education (UME) at U of T. Having situated participants in the goals, priorities, and challenges of medical education at the University of Toronto, participants were primed for their day's task by keynote speaker, Dr. Janna Levin, Professor of Physics and Astronomy at Barnard College of Columbia University in New York. Dr. Levin presented her work on reframing limitations as inspiration, drawing on examples from her background in cosmology to illustrate occasions where—far from restricting creativity and innovation —the acceptance of a limitation inspired new and

groundbreaking ways of understanding the world. Finally, Dr. Martin Schreiber, the Director of Medical Curriculum at U of T, discussed the current teaching methods and structure of the medical school at the University of Toronto and outlined the curriculum renewal currently in progress.

In an effort to capture as much input from participants as possible, a World Café process was employed. Participants were seated in small groups of four to six people and asked to engage in discussion around a series of six questions (**Box 1**). Individual questions were discussed by all participants at their respective tables in 20 minute time blocks, following which, participants were asked to switch seating arrangements, such that no individual would sit with any of the same people twice. One self-selected individual remained at her or his table to act as table host and share a summary of the prior conversation with the new group for each round. The intent of this process was to facilitate engagement between as many individuals as possible within a limited time frame. At the end of each session, the larger group reconvened for a summary open discussion.

Photo Credit: Brian Da Silva

World Café Questions

Session 1:

What has been your most novel learning experience?

What assumptions do we need to test or challenge here in thinking about novel methods to train future doctors?

What are the challenges and opportunities for novel methods to train future doctors?

Session 2:

Based on your rounds of conversation, what had real meaning for you in what you have heard? What surprised or challenged you?

From your discussions so far, what stands out as the most important to pay attention to for training future doctors over the next five years?

What has been your major learning insight, or discovery so far when considering novel methods to train future doctors?

Box 1. *World Café Questions*

The World Café was facilitated by Kim Martens, an expert in helping leaders define and communicate shifts in organizational practices and vision.

To capture discussions and ideas throughout the day, participants were encouraged to 'live tweet' ideas (**Appendix D**), take group notes on large and small canvases, and participate in a 'Fish Bowl' exercise (**Appendix B**). Two experienced researchers with backgrounds in ethnographic methods circulated through the World Café to take observational field notes. The day was filmed and subsequently a short video was produced (https://youtu.be/jlHnrKn_mjw) and posted on YouTube. Themes highlighted in the various talks were also "live scribed" by artist Megan Kirkland.

RESULTS

In order to begin to think about how to challenge limitations in medical education, conference participants needed to first identify and acknowledge some of the barriers that potentially impact the development and delivery of current medical education (**Table 2**).

Several limitations identified relate to system level factors and were felt to be somewhat "fixed," such as the need to adhere to accreditation standards that are set at a national level and mandated by all medical schools in Canada, and financial restrictions surrounding the development/delivery of new curricula. Other limitations

SYSTEM LEVEL
- Accreditation
- Lead time on curriculum change can be up to 18 months
- Curricular time
- Teaching capacity
- Where will the money to redesign curricula come from? How can we create incentives/ rewards for this work?
- Changing nature of doctor/patient relationship. New expectations of MDs expertise required to interpret /triage/ demystify medical information from non-medical resources

CULTURAL LEVEL
- Traditionalism
- Hierarchy
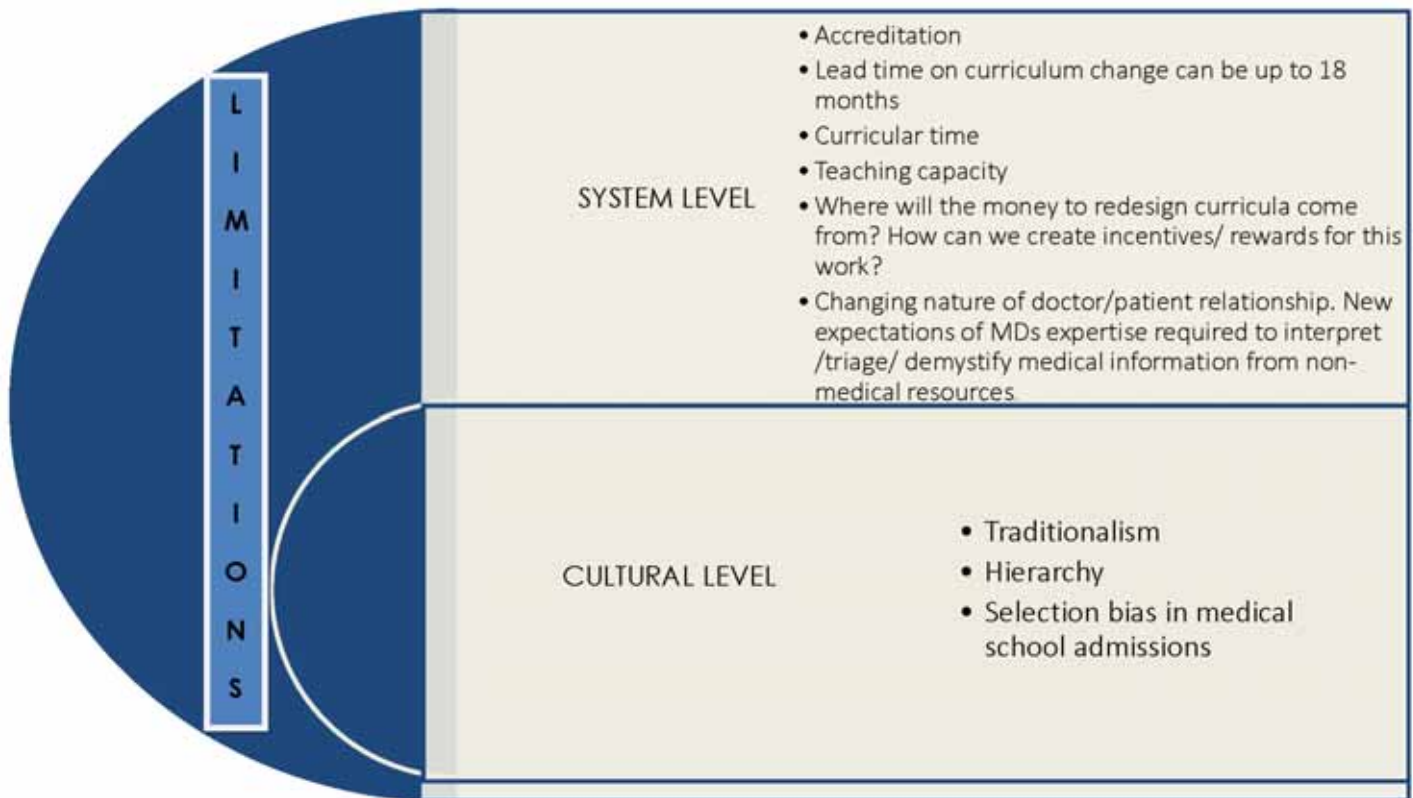- Selection bias in medical school admissions

Table 2. *Limitations*

were less externally imposed and were more closely related to the historical development and cultural norms of medical education. For instance, one tacit factor raised centred on selection bias in medical student admissions, occurring when potential future students are metaphorically parsed out into "relevant" components for consideration that are so stringent and limiting that the types of students who are admitted "look" very much the same as one another, and do not appropriately represent the population that they are being trained to care for. Other limitations included the amount of time and effort necessary to make changes to curricula, and finding curricular time to deliver new content and methods to students.

Having identified the "starting point" (i.e. limitations), participants were then asked what medical education *could* look like. Based on these conversations, we have identified a number of areas for attention. Participants began with identifying ideas at the *concept* level—"big picture" ideas/concerns that would set the stage for re-imagining medical education. Second, participants applied these concepts to curricular design—pinpointing conceptual categories of particular importance to *curricula*. Finally, participants identified eight specific areas of key interest for *future work* (Table 3).
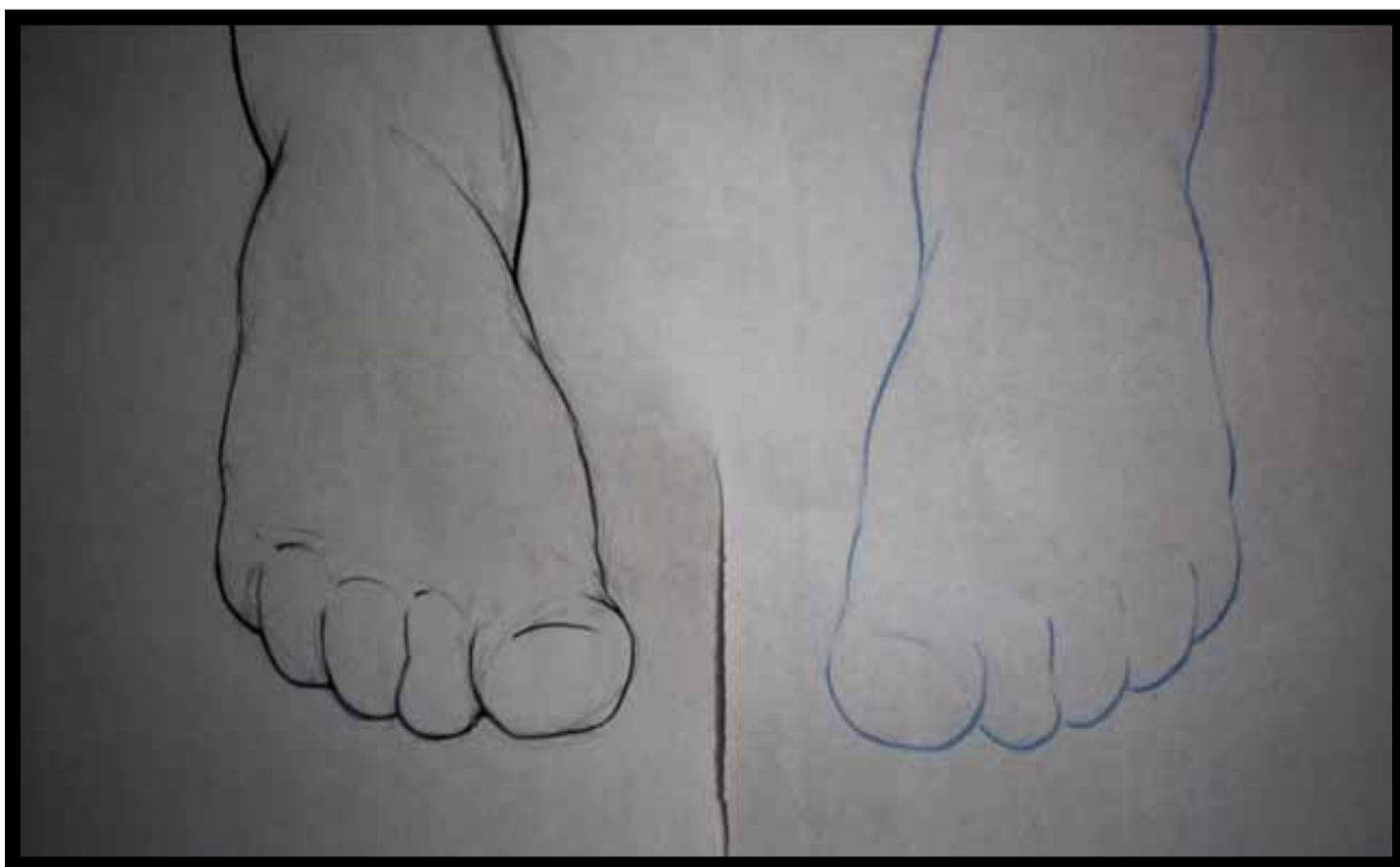

Photo of Artist rendering of the 'lived body map' by Artist Shelley Wall
Photo Credit: Brian Da Silva

Photo Credit: Brian Da Silva

CONCEPTS

Participants began by noting conceptual areas of concern and interest for medical educators for some time. These categories set the stage for beginning to think about the current state of medical education. Conceptual categories included broad areas for consideration, such as the changing role of the physician and the structure of the medical school.

Redefining the Doctor

The role of the doctor continues to rapidly evolve. One thing we know for certain is that, despite our best efforts, the ability to fully predict all the skills and resources that the 'doctor of the future' will need is impossible. We can, however, start to ask questions based on what we do know about present and future trends in medical education, research and practice.

1) Physicians can now access information 'in real time.' It is worth considering which diagnoses, management algorithms, and/or medication doses physicians need to know versus what can be accessed when needed. Furthermore, this will presumably change the role of the physician / teacher with less transmission of rote knowledge and more mentorship.

2) The medical landscape is changing: Nurse Practitioners, Physicians' Assistants, and other health care professionals now often perform tasks traditionally required of a medical doctor. Which skills will be key to tomorrow's physicians and which would be best left to other members of the team?

3) Patient access to information. With an infinite amount of information now available to patients online, the ability to solve medical problems may no longer be solely the job of the physician or health care professional. Being a 'medical problem solver' could perhaps become a new role within medicine, but would require a lot more knowledge, interpretation, and context than the Internet can provide. Given this new context, what is the role that physicians can play with patients to allow for the most effective and safe collaborative care? Patient access to personal medical test results also adds to the complexity of this relationship.

The Structure of the Medical School

Participants debated both the physical and curricular structure of medical schools. Some participants questioned the physical learning space, wondering if we need a classroom at all. They talked about mini escape rooms (modified environments

which require problem solving, leadership skills and exploration of the environment), how class size may affect learning, and how rooms might better be arranged for certain types of learning (i.e. small or large group, interactive, simulated, or mixed methods). Participants also wondered whether medical education was best situated in one school or could be better delivered by means of collaboration between schools.

A system that allows students to continue to pursue areas of interest outside of medicine and in other faculties/departments but still within the same university was suggested. This type of model, they posited, can promote collaboration between disciplines that have traditionally not worked closely together and could cultivate leaders in medicine with skill sets that medical school alone cannot provide. A similar model is currently in place at the University of Western Ontario, where students can work toward combined degrees (e.g. MD-Business, MD-Engineering, MD-Law).

The optimal length of physician training was also debated and opinions varied. Some attendees felt that the current two-year formal curriculum followed by a longer apprenticeship model over years was appropriate. Other ideas included lengthening the training; perhaps making it broader in scope and open to other health care professionals. For instance, health care professionals would be trained together in the first years of training and would then differentiate into more specialized areas, such as medicine, nursing etc. and then, potentially, even further along into desired specialties within those fields. Students would then experience a true

interprofessional model of education, some argued.

A model like this would necessitate a more personalized approach for learners, requiring more mentorship/coaching in the later years of training. This idea aligned with other suggestions around actively cultivating caring and supportive relationships for students throughout their training in the form of a personal education mentor with a connection to and oversight of each student's individual progress both within and outside of the curriculum.

Photo of Live Scribe by Artist Megan Kirkland
Photo Credit: Brian Da Silva

CURRICULA

Qualities of Impactful Learning

When participants were asked to share their most unique and memorable learning experience, most had a few things in common. The experiences discussed were almost exclusively outside of the classroom and were deeply experiential and immersive (**Box 2**). Participants reflected on memories where they felt inspired, and noted common features: these were times when they felt confronted by uncertainty, felt uncomfortable, and had a sense that the stakes were high. Participants identified these times as key moments where "true learning" occurred.

Many participants felt that the current shift to a heavy reliance on simulation and theoretical circumstances in student learning has removed the feeling of "real" urgency and responsibility for outcomes that a student experiences and learns to respond to throughout their training. As a result, it was posited that the reliance on simulation in education might minimize the impact of student learning and possibly create risk-averse students.

Interestingly, it was felt that a shift in culture that explicitly allows students to feel a "safety to fail" should be encouraged. Currently, students are expected to "know all or else" but many attendees desired a shift to a culture that allows for students to not know, flounder, perhaps fail, and come out of the learning experience not shamed, but stronger and smarter. The benefits of discomfort to spur learning must be

QUALITIES OF IMPACTFUL LEARNING EXPERIENCES

⇒ *Experiential*

⇒ *Immersive*

⇒ *Evoke uncertainty*

⇒ *Induce discomfort*

⇒ *High stakes*

⇒ *Safety to fail/transparency*

⇒ *Alignment of passion and vision*

⇒ *Maximize emotional connection*

⇒ *Highlight teacher – learner relation-ships*

Box 2. *Qualities of Impactful Learning Experiences*

balanced with patient and student safety of course.

Although participants were asked to specifically imagine new curricular ideas (the 'how' to deliver education materials), this task is inextricably linked in some ways to the 'what' to teach. Many important ideas for the 'what' were suggested and need to be considered (**Box 3**). Of interest, the majority of this suggested new curricular content is not medical content per se, but rather the skills needed for a physician in a changing system.

THE 'WHAT' TO TEACH

⇒ *How to deal with uncertainty*

⇒ *Humility. Question and 'un-train' ideas of status and influence*

⇒ *Curiosity (teach it vs. stimulate it?)*

⇒ *How to learn when content is no longer 'king'*

⇒ *How to partner with patients and with the system*

⇒ *Self-awareness (personal learning style, self-regulation)*

⇒ *Self-Care (a course including core concepts of nutrition, dietary management, curricular time for individualized appropriate exercise/personal trainer. This should have a very strong mental health component and could include a faculty sponsor or staff monitor etc.)*

⇒ *Adapting to and interpreting technology (e.g. if patients are coming in with personal fitness trackers and other data points, MD's and others should ideally be able to interpret them).*

⇒ *Team based learnings (team dynamics, feedback/conflict resolution/ recognition of roles and competencies)*

⇒ *Policy making, social responsibility/accountability*

⇒ *Quality improvement principles/culture*

⇒ *How to teach - would have benefits for patient education and may support more students becoming interested in teaching*

Box 3. *The 'What' To Teach**
*It should be noted that some of these suggestions are currently being addressed.

RECOMMENDATIONS FOR FUTURE WORK

Based on participants' responses to the World Café Questions (**Box 1**) as well as the concepts and curricular level considerations raised (**Box 2 and 3**), participants suggested a series of specific project ideas that might constitute the beginnings of a "Breakthrough" in medical education. As was the mandate of the day, these projects were either inspired by or related to one or more of the limitations (**Table 2**) raised earlier in the day. Each project is listed below, along with a quote from a participant related to the idea and possible next steps for development are suggested.

SUMMARY OF RECOMMENDATIONS

- 1 - Design Lab
- 2- Student Breakthrough Conference and/or 'Living Lab'
- 3 - Social Incubator - Immersive Experience in Caregiving
- 4 - Redefine Leadership
- 5 - Rethink Admissions Criteria
- 6 - Integrate Education
- 7 - Address the Culture of Medicine
- 8 - Expand the Conversation

Table 3. *Summary of Recommendations*

1 – DESIGN LAB

Inspiration/limitation:

Hierarchy: Students are not equipped to design curriculum.

Traditionalism: Learning must take place in a classroom.

"...medical school students are going to learn most from spaces that are not necessarily within the curriculum...meaning not within the classroom and not even within the clinical setting but through circumstance and happenstance through their day...people like Steve Jobs knew this at Apple, because he knew the best situations and innovations happen when people met in the hallway by happenstance and collaborated from different parts of the Apple world ... if we're going to be transformative and bold and all that, maybe we need to rethink the space of the medical school on a campus and also just the way we are delivering education."

Stemming from the idea of 'meeting students where they are' and respecting their expertise to play a role in their own curriculum, creating a design lab for the development of curriculum would allow the space and expertise to have ongoing curriculum renewal projects on a small scale. This model could incorporate rapid quality improvement (QI) cycling to determine

success. Students would have the opportunity to work with a design team to consult, create and test curricular ideas in real time.

As learners, students would gain experience and exposure working with interprofessional teams, QI, innovation, and creative design. As an educational model, the collective projects would result in continuous curriculum development, assessment, and implementation that would increase "buy in" because it would be designed by the end users. The team could be comprised of senior medical educators (on a rotating basis?), education scientists, designers, communications strategists, entrepreneurship professors, patients etc. and could potentially include a virtual world of outsider consultants. Medical students could do electives or selectives with the design team. This innovation laboratory would be a safe place to take risks.

Similar initiatives exist in health services and patient education but none where the end user would be the creator of the product to this extent. This 'service' could be used to reconsider existing curricula, assess new curricula, develop new curricula within existing objectives/ competencies or could create new objectives or competencies in areas of identified gaps or community directed needs. Output from this work depending on level of involvement could 'count' as scholarly work to meet other curricular objectives for involved students. This might be an opportunity to involve students from these other disciplines as well on an elective basis.

2 – STUDENT BREAKTHROUGH CONFERENCE AND/OR 'LIVING LAB'

Inspiration/limitation:

Hierarchy: Students are not equipped to design curriculum.

Patients, educators, providers and medical students all have a stake in ensuring quality medical education. Medical students themselves are impacted directly by this curricula on a daily basis. Participants agreed that partnering medical students with students from other disciplines could facilitate the transfer of academic worldviews, and open new possibilities for engaging in learning.

"Barriers to [innovation] are always organizational and cultural [it would be helpful to] pull together students from the business school. Undergraduates in [business] programs [could] work on projects collaboratively with undergraduates from [the medicine] program and actually develop not just skills but also relationships and perspectives."

Specifically, the idea of a student organized/facilitated Medical Education

Photo Credit: Brian Da Silva

Breakthrough conference was raised as an ideal opportunity to get students from varying backgrounds together to reimagine medical education using the Breakthrough methodology from a student perspective. Questions were imagined such as "what are we not learning" and "what should we not learn", these might allow educators insight into the perceived value of the current model.

"[The idea would include] … providing medical students with similar experiences, opening up the walls of the university and making it transparent within areas and other disciplines like we did today."

Furthermore, this could also be piloted on a different scale as a 'Living Lab' using the 'hackathon' model (team based, intensive focused program/product development)-- though not necessarily technology focused, with a multi-disciplinary student team. With faculty guidance, students from different fields can work on a rotation of problems from each of the various student fields. This would fulfill multiple objectives for all students including

establishing a model for collaboration, for innovation, and for shared experience that could translate through training and out into practice while addressing social accountability mandates for tackling issues of concern to the public and to each profession.

Next steps:

Partner with faculty and students in other disciplines (e.g. Business, engineering, media) to design and pilot a student led, student run, student reported, Medical Education Breakthrough Conference and/or faculty guided 'Living Lab' for students from multiple disciplines.

3 – SOCIAL INCUBATOR— IMMERSIVE EXPERIENCE IN CAREGIVING

Inspiration/limitation:

Traditionalism/Hierarchy/Time: Patients do not have the knowledge to advise on medical education.

"Every medical student should spend a year involved in the daily life of caregiving for somebody who has a very challenging condition, so that they know minute-by-minute, day-by-day, what it takes to care for a patient, and if they see that and still want to be involved in medicine then there will be good people in medicine."

No medical educator could deny the value that a student might gain by spending an extended period of time with a patient. Other ideas in this area that may be more time permissible and fit more easily with existing course objectives include pursuing an in-depth exploration of a patient population to experience a broader culture of being well or unwell from the patients' perspective over time throughout pre-clerkship. Another possibility would be to spend a post-operative day with a patient or a day-in-the-life of a person with a new diagnosis (one example was an ankle fracture) to understand the lived experience of a person or group, perhaps even as a way to teach empathy. It was felt that these experiences would be best contextualized if the students functioned as caregivers or advocates rather than focusing on the MD role in this situation. Other ideas were to try to connect the students in a meaningful way to a complex patient or a high user of health care services or even to follow a patient longitudinally while they are well to get a sense of the 'big picture' of wellness and how it can de-rail over the course of four years. Students could produce a podcast of this experience over time. All of these ideas may allow students to better link patient outcomes with learning.

"… what if every medical student had his or her patient advisory group, that they were able to go back to and talk to throughout medical school, to throw things back at them about how a student has changed throughout the process of medical school and to challenge the ideas they've been coming through with but to also bring in new ideas for them, as part of that learning process."

The focus of this recommendation is to shift the starting point – instead of beginning with the perceived training needed to serve the community, what would it look like if all students started with experiencing the needs of the community and then worked back to training?

Next steps:

This may take the form of an early 'patient observership/relationship' experience combined with a patient advisory board. There is some precedent for this with the Patient as Teacher Program at CAMH which has been quite successful to date.

> **Steve Hawrylyshyn**
> @Steveoph
>
> Follow
>
> What happens when you get 60 diverse professionals & ask how can we train doctors better? #breakthrough
>
> 9:09 AM - 8 May 2015

Live Tweet from Breakthrough Conference Participant @Steveoph

Photo Credit: Brian Da Silva

4 – REDEFINE LEADERSHIP

Inspiration/limitation:

Traditionalism/ Hierarchy

This recommendation is based on the idea that, by definition, leaders are in a system that is designed to perpetuate the status quo. If we really want to make changes, it stands to reason that we must first challenge the presumed model of success and begin to conceptualize what successful leadership and direction might look like if we opened up our goals and expectations to include something new.

"... I wanted a stream [within medicine] that allowed us to re-define leadership, because I think that however

much we think in terms of teams there are times when a medical student is going to have to anticipate being a leader in terms of their thinking ... the idea would be to re-define leadership a little bit away from the business model that has arguably dominated our leadership."

Another participant suggested a possible strategy to diversify the concept of leadership within medicine,

"I think one of the reasons we're very good at continuing to produce the kinds of doctors that produced us is that that's what we know and I think if we're really going to transform medical education we're going to need to give a little bit of thought around who is going to usher that transformation and not kid ourselves to think that just because we think it's a good idea, that we're going to be able to carry it through... [Ideas such as] Exposing our students to patients that are vulnerable early on, transcultural

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Photo Credit: Brian Da Silva

Inspiration/limitation:

Traditionalism: Medical school admissions are based on scholarly output and perceived potential, primarily in the sciences.

"...medical school is predicated on the people who are selected and this is almost always the 'academic elite.'"

Similar to recommendation number four (redefining leadership), this idea proposes that if you continue to use the same "ingredients" you will more often than not get the same "dish." Rather, the goal is to attract students who think differently.

To attract more diverse students, participants proposed changing admissions criteria to be more representative of the society that doctors are being trained to care for. In order to do this, participants felt that it was important to look not only at "the student" who we are currently accepting, but to also examine who is applying and why others might not be applying.

This is an area that has already been prioritized by the University of Toronto Faculty Of Medicine. In particular, a multi-pronged approach has been implemented that includes assessing and strengthening avenues for increased pre-medical educational diversity, focusing on students who have studied in the social sciences and humanities (Hall et al. 2014). Also, nine

stuff that was alluded to, I am all for the international exchange myself. For that to actually become a really transformative learning experience then I think we'll need teachers and mentors that have a very different approach to education and teaching than we currently have for most of us."

Next steps:

Working group or consultation of insiders/outsiders/experts/ novices/ local/ international members to reconsider leadership using diverse perspectives and histories.

cohorts from four Canadian Medical Schools (including U of T) completed the Health Professions Student Diversity Survey looking at both 'surface and deep diversity' items such as age, gender, gender identity, sexual identity, marital status, ethnicity, rural status, parental income and disability. The results of this study led the authors to propose a "National Student Diversity Database" to support both locally relevant policies regarding pipeline programs and an examination of current application and selection procedures to identify potential barriers for underrepresented students. (Young et al. 2012)

Other steps that the U of T has already undertaken to address this recommendation include more expansive bursary programs, targeted outreach to specific ethnic groups, including Indigenous Canadians and Black Canadians as well as a reimagining of the admissions process itself, including the Modified Personal Interview (MPI) which assesses non-academic attributes and enhances the interviewers' ability to 'get to know' the applicant and also improves inter-rater reliability.

Next steps:
Admissions committees to consider 'outsider' involvement in the interview process. Also to more formally consider and recognize evidence of innovation or skills in creative design as meaningful qualities of applicants in order to admit students who think differently. Additionally, marks based entry cut offs may need to be re-considered in light of barriers that this may pose to applicants from non-traditional backgrounds.

6 – INTEGRATE EDUCATION

Inspiration/limitation:

Structural: Degree requirements are set outside of the program.

As discussed above (Page 10) this idea involves medical roles becoming blurred and re-organized. One example of this type of remodelling is the example of the University of Western Ontario and their offering of combined MD/'other' degrees. Another idea presented involves a reverse process: students who are interested in providing health care would begin with a basic health care degree (3-4 years) then discipline-specific professional schools would provide hands-on training – students would already have the core knowledge before entering medical school.

Photo Credit: Brian Da Silva

Photo Credit: Brian Da Silva

"… students come to medicine and medical school all having some kind of life sciences training and others coming from other professions that haven't [had life sciences training] and the fact that a lot of medical roles are increasingly becoming blurred in terms of people doing different things in health care, we thought that perhaps universities should re-organize so that there is a basic health care degree and whether you are in pharmacy, or medicine, or chiropractic or dentistry, that you complete a basic 3-4 years with different exit points that you can apply to the different professional schools for the professional schools to get to the business of hands-on training."

On a different scale, another idea was to provide smaller streams similar to the LEADS (Leadership Education and Development) program that already exists at the University of Toronto which pre-admits a group of students who will do combined curricula throughout their MD training that will help to develop their potential as leaders. Could similar smaller streams within medical school be created that are aligned with the other CanMeds roles including advocate, collaborator, communicator, etc.? The combined MD/Scholar stream already exists as the MD/PhD program.

Another idea was to offer an elective or selective system for medical students to continue to pursue areas of interest outside of medicine in other faculties/departments.

"It should be a goal of ours to support students who rush through Undergrad or take the traditional path to get into medical school and may want to continue to explore non-medical courses which will enrich their

educational experience and hopefully allow them to bring back interesting perspectives to medical school and their journey in medicine. This would promote collaboration between disciplines which traditionally don't work closely together. Imagine what students from medicine, business, dentistry, law, engineering, humanities, education, art, political science, journalism etc. could learn from each other."

Next steps:

Target and then explore relationships with other faculties that may be interested or open to collaboration in education on a small or larger scale.
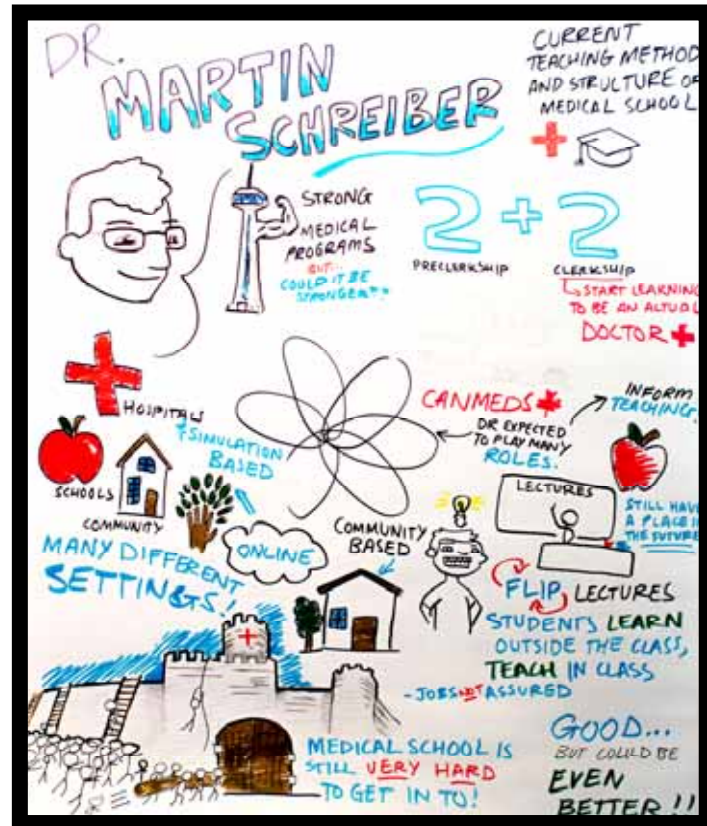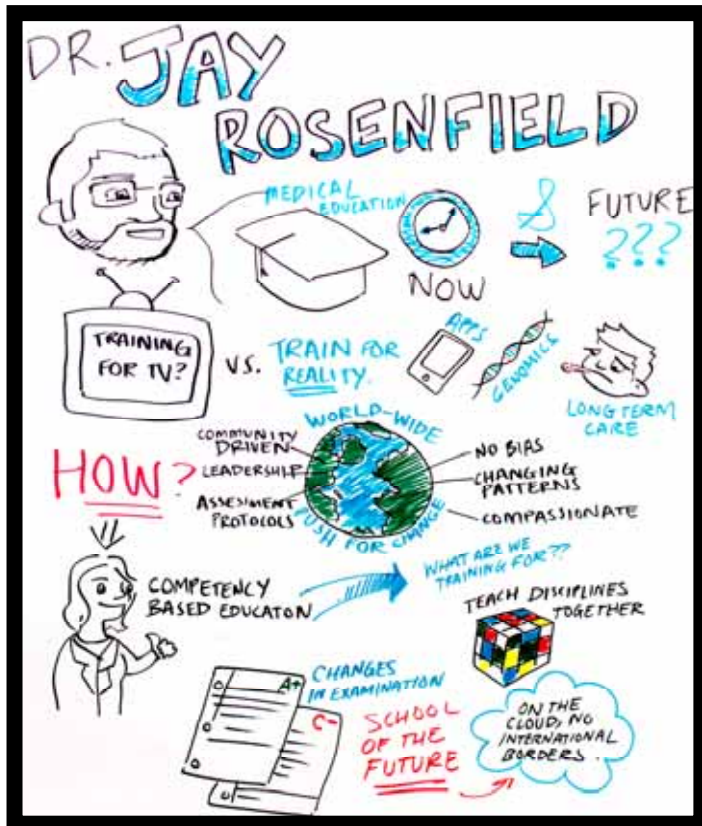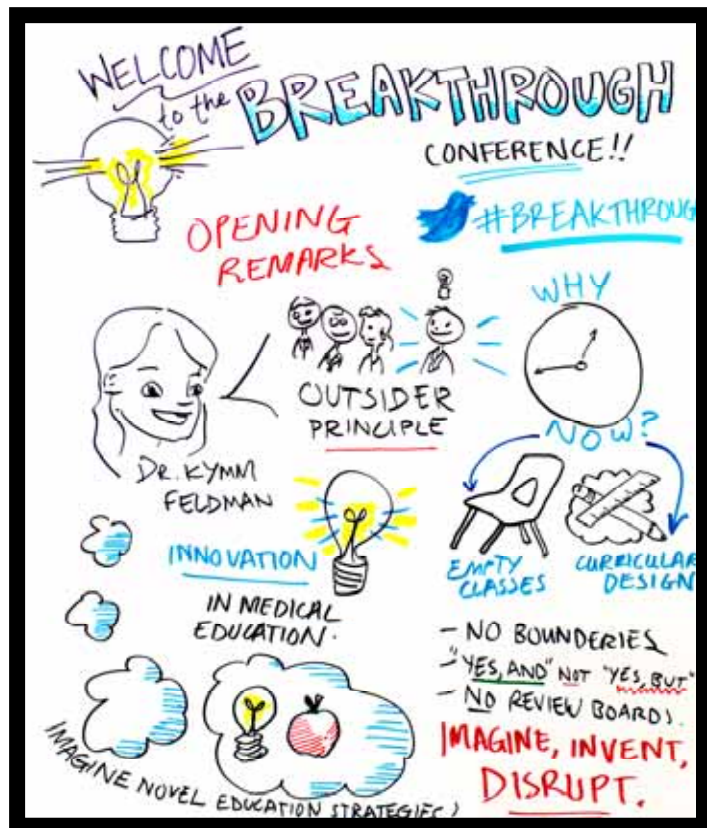
Photos of Live Scribe by Artist Megan Kirkland

Photo Credit: Brian Da Silva

> *"A paradigm shift occurs when a question is asked inside the current paradigm that can only be answered from outside it."*
>
> *Merilee Goldberg,*
> *The Art of the Question*

7 – ADDRESS THE CULTURE OF MEDICINE

Inspiration/limitation:

Traditionalism: Culture of medicine as a paradox—a space to learn where the expectation is that you know all.

"The whole issue of students not knowing the answers to things...what we do with uncertainty, not knowing the answer to questions we're asked... the proposal was for "I don't know" rounds [that would] become a part of learning right from the get go."

Another suggestion was a virtual morning report where all students or students by rotation 'tune in' remotely. This could be in a webinar type of format where students can sign in anonymously and would perhaps feel more free to answer incorrectly and ask all, even basic, questions while removing risks of faculty/peer judgment. Cases could be submitted anonymously in advance or basic scenarios could be covered. Another similar idea would be anonymous virtual 'office hours'.

In further considering potential concerns raised in the 'qualities of impactful learning' section (Page 11) the loss of consequences in simulation might contribute to a lowering of the 'stakes' required for "true learning", could we somehow raise the virtual stakes:

"Maybe there is integration among all cases in preclerkship such that they are your

panel of patients and you have a score card for all of your actions within the cases that is cumulative. That way there will be motivation to study prior to taking any post-tests or clinical 'actions' because your total will quasi reflect how 'good' a clinician you are. Perhaps there are a few overall context cases which tie in a number of the known patients into a family or hospital or community or say an outbreak situation...'The Universe-City of Toronto.' There can be some real time dramatizations in the larger group setting which model different approaches...like public health as in the outbreak example...so it's completely integrated learning but with some consequences to your virtual self or avatar. You wouldn't shame low scorers but you could publish the average scores and also reward the top scorers as 'physicians' of the year? Gamification meets medical school on a large scale..."

The Faculty of Medicine at the University of Toronto is already paying significant attention to the learning environment and the culture of medicine. Undergraduate Medical Education has established the Faculty of Medicine Learning Environment Working Group, involving hospital and clinical teaching sites as well as Post Graduate Medical Education, to support and enhance the learning environment and address issues detracting from a positive learning environment. Additionally, the Office of Health Professions Student Affairs is involved in three studies assessing medical student wellness as it relates to the learning environment. Many aspects are being examined in detail including empathy, tolerance of ambiguity, ways of coping,

student resilience, engagement, support, and learning culture.

Next steps:

Pilot of some of the above ideas considering evidence and additional themes uncovered in the student environment studies that are currently underway at the Faculty of Medicine.

8– EXPAND THE CONVERSATION

Inspiration/limitation:

Traditionalism/Hierarchy/Time: Patients / the public does not have the knowledge to advise on medical education.

In addition to ideas about patient input into medical education, it was posited that this could be an even larger conversation. It was felt that expanding the conversation to public consultation and debate on a large scale could lead to major system innovation, and to criticism as well, but overall that this could be a fascinating and useful exercise.

Next steps:

Partner with journalists and the media to bring this discussion out of university discourse alone and into people's living rooms. Start the discussion of what role the public (not just patients) could play in contributing to curricula, training models and models of patient care.

DISCUSSION

Finding inspiration to innovate within limitations is not an easy task. By definition, limitations restrict and constrain, define boundaries, and close off external possibilities. The idea of not only recognizing, but highlighting, existing limitations in medical education seems, at first glance, counterproductive for inspiring change. For many, setting out a day of creative engagement with a series of "here are the things that can't be changed" would be seen as oppressive and negative. At the Breakthrough Conference, once raised, these limitations were reframed as starting points to reimagine what the Medical Education of the future *could* look like.

When discussion began participants consistently raised systemic issues, such as accreditation and lack of funding, as the primary challenges in medical education. Systemic limitations are particularly difficult to address when imagining a new direction for the future, as individuals often feel powerless when faced with large, bureaucratic structures as their perceived opposition. As the day progressed, however, conversation shifted and became more focussed on the cultural limitations, the ways in which medical education is limited by our own history and assumptions. By actively soliciting and welcoming the perspectives of those outside of medical education, some of the cultural limitations and assumptions within medical education were explicitly identified and problematized, a first step in creating a cultural shift. A paper in the Journal of Futures Studies described how cultural change is a necessary precursor to systemic change (Tibbs 2011), and though daunting, it is possible that by recognizing and addressing the cultural limitations that exist within medical education, we might signal a cultural shift, which may then result in a significant systemic breakthrough.

A cultural shift within medical education at the University of Toronto has already begun. Though some of the suggestions for future directions were new to participants outside of the University of Toronto, several have already been identified as areas for consideration at the Faculty of Medicine. Specifically, projects three (Social Incubator-Immersive Experience in Caregiving), five (Rethink Admissions Criteria) and seven (Address the Culture of Medicine) have already been raised as priorities and the recommendations above build on this work. The Breakthrough Conference created a space that allowed light to be shed on areas where change is needed, facilitated

Photo of a 3-D Printed Heart
Photo Credit: Brian Da Silva

conversations and engagement between existing and potential collaborators who might play a role in making change happen, and provided a platform for suggestions for possible directions in the form of seed projects. While the results of the day are exciting, they will only have a lasting impact if we continue the same levels of constructive criticism, excitement, engagement, and passion that filled the conference space and spilled out onto the streets of Toronto this past spring. We encourage all participants, their colleagues, and their colleagues' colleagues to continue to collaborate within and outside of medicine to create the best possible education for tomorrow's medical students.

WHAT NOW?

Faculty within the Department of Family and Community Medicine and the Faculty of Medicine will review the Breakthrough Conference Report and meet to prioritize the above recommendations and develop next steps. Conference participants will be invited to participate in future work as we continue to aim for a Breakthrough in medical education. We plan to maintain outsider consultation in any projects that move forward. At this time of curriculum renewal there could not be a better opportunity to make and test some of the proposed ideas. The Department is grateful to all participants for their time and expertise, and we look forward to ongoing collaboration.

"The problems we have cannot be solved at the same level of thinking that created them."

Albert Einstein

ABOUT THE AUTHORS

Kymm Feldman, MD CCFP MHSc is a Family Physician and medical educator and, at the time of the Breakthrough Conference, was the Program Director for Undergraduate Medical Education for the Department of Family and Community Medicine (DFCM) at the University of Toronto. Dr. Feldman has been recognized for her work in education and the creation of innovative curriculum by the CAME Certificate of Merit 2015, the DFCM Dr. Elizabeth Anne Beattie Teaching Award for Excellence in Teaching in the Preclerkship, the DFCM Faculty Award for Excellence in Course Design and Coordination and the DFCM Faculty Award for Excellence in Leadership. She was also the recipient of the distinguished W.T. Aikens Award for Course/Program Development by the Faculty of Medicine in 2014.

Melanie Hammond Mobilio, MA, is a Research Associate with the Wilson Centre, University Health Network. With a background in medical anthropology, she specializes in qualitative research in areas including Family Medicine, medical education, and surgical culture.

Susan Noelle Rice, MA, is the Administrative Coordinator of the Leader and Collaborator competencies at the University of Toronto, Undergraduate Medical Education. With a background in social anthropology, she has a special interest in collaborative/leadership research projects which focus on curricular innovations.

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REFERENCES

Ogur B, Hirsh D, Krupat E, Bor D. "The Harvard Medical School-Cambridge integrated clerkship: an innovative model of clinical education." Acad Med. (2007): Apr;82(4):397-404

Gaufberg E, Hirsh D, Krupat E, Ogur B, Pelletier S, Reiff D, Bor D. "Into the future: patient-centredness endures in longitudinal integrated clerkship graduates." Med Educ. (2014): Jun;48(6):572-82

Hales, R. "Faculty Board Proposes Accelerated Medical School." Faculty Board Proposes Accelerated Medical School. Accessed July 3, 2015. http://www.queensjournal.ca/story/2012-05-28/news/faculty-board-proposed-accelerated-medical-school/.

"The World Cafe, 'Design Principles.'" 2015. Accessed June 15, 2015. http://www.theworldcafe.com/principles.html

Hall JN, Woods N, Hanson MD. Is Social Sciences and Humanities (SSH) Premedical Education Marginalized in the Medical School Admission Process? A Review and Contextualization of the Literature. Acad Med. (2014): 89(7):1075-1086

Tibbs, H. "Changing Cultural Values and the Transition to Sustainability." Journal of Futures Studies. (2011) Mar;15(3):13-32

Young M, Razack S, et al. "Calling for a Broader Conceptualization of Diversity: Surface and Deep Diversity in Four Canadian Medical Schools." Diversity and Inclusion in Academic Medicine (2012): Nov; 87(11): 1501-1510

APPENDIX A

The Breakthrough Conference Invitation

BREAKTHROUGH CONFERENCE

REIMAGINING EDUCATION FOR DOCTORS

THE BREAKTHROUGH CONFERENCE

THE SPOKE CLUB
TORONTO
MAY 8, 2015

BY INVITATION ONLY

THE EVENT
A think-lab to engage experts from fields outside of medicine to imagine novel methods of teaching and learning that will help create the physician of the future.

YOU ARE INVITED
Educators involved in teaching Family Medicine at the University of Toronto medical school invite you to bring your expertise and voice to participate in a one-day think-lab to help re-imagine how to engage medical students in learning in new and different ways.

This think-lab will bring 60 leaders together from a variety of fields - including technology, business, health, the arts, government, and more - to try an experiment: Can a group of leaders from outside the medical field collaborate with and guide those within it to imagine novel methods to educate and build exemplary physicians of the future?

NO MEDICAL EXPERIENCE NECESSARY

At its core, many of the qualities that make for an excellent physician are also found in a great teacher, a forward-thinking computer programmer or an innovative entrepeneur. This may include challenging the status quo, being dedicated to one's craft, and searching for new solutions to old problems.

What's more, all of us have experienced the health care system, personally or through a family member or friend. These experiences provide important insights into what makes a good doctor, a well-functioning healthcare system and a quality patient experience.

You have been invited to attend because your leadership, knowledge, and experience can contribute to finding novel ways of educating physicians of the future.

Medical education needs new voices – please lend your unique perspective to medical education and be one of those voices.

For more information and to RSVP

Email us

Our mailing address is:
DFCM Communications Account
500 University Avenue
Toronto, Ontario M5G 1V7
Canada

APPENDIX B

The Fishbowl Exercise

The fishbowl exercise was designed to encourage participants to engage in yet another way by posting thoughts on a dedicated wall. All ideas from the fishbowl were entered into a Word document. The image below was then created using Wordle, a program that processes data and produces a "word cloud" that gives prominence to words based on their frequency in the source text.

APPENDIX C

Participant List

We would like to thank the following people for bringing their knowledge, insight and perspectives to this event:

Erika	Abner		Anita	McGahan
Kelly	Aizicowitz		Erica	Merman
Ruby	Alvi		Sabrina	Nurmohamed
Peter	Azmi		Joyce	Nyhof-Young
Amin	Bahubeshi		Nav	Persaud
Susan	Bartlett		Steve	Pomedli
Glen	Bandiera		Varuna	Prakash
Onil	Bhattacharyya		Jeremy	Rezmovitz
Gary	Bloch		Cathy	Risdon
John	Bohnen		Michael	Roberts
Ameya	Bopardikar		Katherine	Rouleau
Pier	Bryden		Robin	Sears
Peter	Cen		Ivan	Silver
Chi-Ming	Chow		Sean	Stanleigh
Julie	Crochetiere		Sanjeev	Sockalingam
Ali	Damji		Raman	Srivastava
Joel	Donin		Robyn	Sussel
Sheila	Dunn		Richard	Toker
Philip	Ellison		Ross	Upshur
Kymm	Feldman		Ceda	Verbakel
Milena	Forte		Shelley	Wall
Risa	Freeman		David	White
Piyush	Gandhi		Catharine	Whiteside
Sandra	Gionas		Lynn	Wilson
Maya	Goldenberg		Jason	Wong
Eva	Grunfeld		Lisette	Yorke
Mark	Hanson		Molly	Zirkle
Steve	Hawrylyshyn			
Mike	Heinrich		**STAFF**	
Ruth	Heisey		Taras	Blizniouk
Patricia	Houston		Cecil	Canteenwalla
Hussein	Jaffer		Brian	DaSilva
Danial	Jameel		Kim	Martens
Prabhat	Jha		Allison	Mullin
Alan	Kay		Tara	Munro
Helen	Kerr			
Megan	Kirkland		**SPEAKERS**	
Kulamakan (Mahan)	Kulasegaram		Kymm	Feldman
Joshua	Landy		Janna	Levin
Nadine	Laraya		Jay	Rosenfield
Marcus	Law		Martin	Schreiber
Jana	Lazor		Lynn	Wilson
Karen	Leslie			
Steve	Markle			

APPENDIX D

Storify Twitter Feed

The Breakthrough Conference brought together over 80 innovative thinkers from diverse fields to gain new perspectives on the challenges of medical education. See the Twitter version of the event on Storify.

Lynn Wilson @drlynnwilson — Follow

Great to have #UofT med students & faculty exchanging ideas with leaders from business, arts, technology, astronomy & more! #breakthrough

9:44 AM - 8 May 2015

↩ ⟲ 4 ♥ 1

Sean Stanleigh @seanstanleigh — Follow

Imagine. Invent. Disrupt. Those are the themes for today's #breakthrough medical conference. These are words I like to hear.

9:19 AM - 8 May 2015

↩ ⟲ 3 ♥ 2

Susan Bartlett @bridgeableSusan — Follow

Discussing what medical students need to learn for the future. #breakthrough
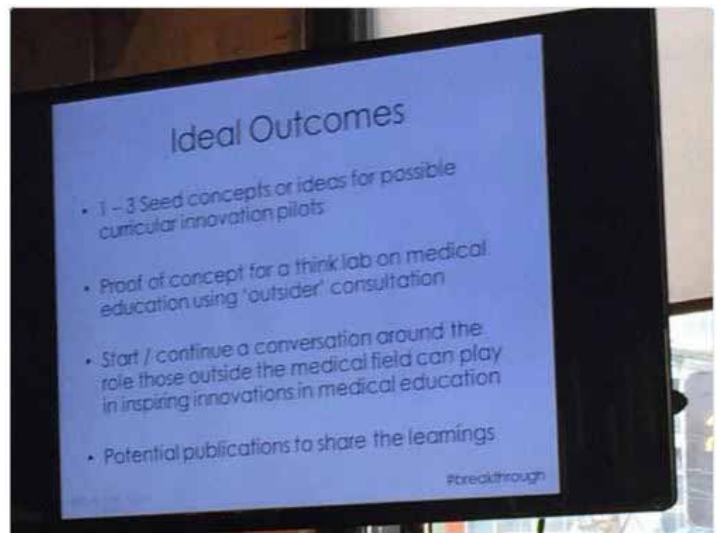
12:39 PM - 8 May 2015 · Toronto, Ontario, Canada

↩ ⟲ 3 ♥ 2

UofT Family Medicine @UofTFamilyMed — Follow

Partnerships in action - let's bring business, technology and medical students together to truly be ahead in healthcare #breakthrough

2:54 PM - 8 May 2015

↩ ⟲ 5 ♥ 2

UofT Family Medicine @UofTFamilyMed — Follow

A panorama of perspectives #breakthrough

1:37 PM - 8 May 2015

2   1

robynsussel @robynsussel — Follow

Today's principles: anything goes. No Yes, but. Only yes and ..... #breakthrough

9:17 AM - 8 May 2015

↩ ⟲ 3 ♥

THE
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