Current Issues in Medical Education: A Metamorphosis

Dr. Sarita Verma, LLB MD CCFP
Vice President, Education
The Association of Faculties of Medicine of Canada
Professor Emerita DFCM
Former PG Dean, University of Toronto & Queen’s University
Former Deputy Dean and Associate Vice Provost, University of Toronto
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A Mickles Talk In Three Parts

At the end of this presentation Participants will be comfortable discussing:

• Preparing the Next Physician in the context of Rapid Evolution
• A Key Issue in Physician Workforce: uCMG
• The Metamorphosis of Leadership based on my journey
Conflict of Interest

• Many COI issues.
• Personal and Intellectual Investment over 25 years
• History Repeating Itself
• Legacy challenges with Academic Medicine
• Attributions: Julio Frenk; Brian Hodges; ARMC/AFMC; BMJ; NAC
• HPE undergone substantial and exponential, changes during the past decade.
• Within the context of ongoing experimentation in the health care system, unprecedented and rapid technology and learning modalities.
• Experimentation on those who learn in today’s world but who will practice in the “revolution” of the age of digital and artificial intelligence.
Warning

CHANGE AHEAD
Pressure on Health System to Change

- Sustainability, Affordability
- Disease trends
- Safety and Quality, Accessibility
- Aging population
- Workforce
- Public health, primary health
- Return on Investment
- Social Accountability
- Globalization
- Aging population
- Disease trends
- Safety and Quality, Accessibility
- Workforce
- Public health, primary health
- Return on Investment
- Social Accountability
- Globalization
Determinants of Population Health

Other factors that impact health outcomes

Health care services

Social Accountability Framework

- Policy Makers
- Health Managers
- Communities
- Health Professions
- Academic Institutions
- People Needs Based Health System
OLD WORLD

The doctor is on top of the hierarchy

NEW WORLD

Health care is part of a complex organization
OLD WORLD
Source of knowledge is expert opinion

NEW WORLD
Source of knowledge is evidence based
OLD WORLD
Each of our professions practice in silos as individuals

NEW WORLD
All of us work predominantly in teams
OLD WORLD

Duration based education

NEW WORLD

Competency based education
OLD WORLD

Countries can produce their own health force

NEW WORLD

International migration: the workforce is constantly moving and evolving
OLD WORLD

Determinants of health were contained by geography

NEW WORLD

Disease and Infections know no boundaries
OLD WORLD

Technology was adapted for our use

NEW WORLD

We are slaves to technology
OLD WORLD

Doctor was the holder of knowledge

NEW WORLD

Anyone can Google anything and assess the evidence
Are doctors becoming obsolete?

- Robots
- Artificial Intelligence
- The Internet of All Things
Evidence technology is replacing humans

Nature 2017-02
Da Vinci: A Perspective on the New OR Team
Pepper the robot and the new Phlebotomist
• **Required Core Health Conditions (10):** Anemia, Atrial Fibrillation (AFib), Chronic Obstructive Pulmonary Disease (COPD), Diabetes, Leukocytosis, Pneumonia, Otitis Media, Sleep Apnea, Urinary Tract Infection, Absence of condition.

• **Elective Health Conditions (Choice of 3):** Cholesterol Screen, Food-borne Illness, HIV Screen, Hypertension, Hypothyroidism/Hyperthyroidism, Melanoma, Mononucleosis, Pertussis (Whooping Cough), Shingles, Strep Throat.

• **Required Health Vital Signs (5):** Blood Pressure, Heart Rate, Oxygen Saturation, Respiratory Rate, Temperature
Darwinian step of medical practice evolution

INTERNET OF MEDICAL THINGS: MATURITY LEVELS

1. ASSISTANCE
   - Sensors for Monitoring
   - Vitals, health parameters logging
   - Now

2. PARTIAL AUTONOMY
   - Minor tasks performed automatically
   - Automated syncing, sharing with care provider
   - 1-5 years

3. CONDITIONAL AUTONOMY
   - Insight using analytics, user decides action, software performs
   - Care team alerts for medical intervention when parameters out of pre-defined range
   - 6-8 years

4. HIGH AUTONOMY
   - Software decides and acts under human supervision
   - Automated intervention with educational, motivational, activity information using additional data from ‘connected home’ appliances
   - 9-15 years

5. FULL AUTONOMY
   - Software operates under complete autonomy – user can override if necessary
   - Schedule doctor appointment*, arrange for transportation and provide care suggestions in the mean-time
   - 15+ years

*First & Sullivan does not envision a scenario where machines and software make medical decisions.
The future is here

You will never go to the doctor's again.

PUSH DOCTOR

See a doctor online in 6 minutes


PUSHDOCTOR.CO.UK

TRUSTPILOT

Open Every Day
6am - 11pm
Ten Trends in Health Care already Here
Harvard Business Review

- EMRs
- Patient Portals
- Robotics
- Virtual Visits
- Personalized Medicine (genetic medicine)
- Scope Creep between professions (in and out)
- Generics and Big Markets—Online purchasing
- Entrepreneurial Medicine (for profit)
- Digital Economy—Privacy and Information
- Catalytic Knowledge Explosion
Knowledge Revolution

Medical Knowledge in Relative Units

<table>
<thead>
<tr>
<th>Year</th>
<th>Doubling Time (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>0.2</td>
</tr>
<tr>
<td>2010</td>
<td>3.0</td>
</tr>
<tr>
<td>1975</td>
<td>7.0</td>
</tr>
<tr>
<td>1960</td>
<td>10</td>
</tr>
<tr>
<td>1950</td>
<td>50</td>
</tr>
<tr>
<td>1900</td>
<td>150</td>
</tr>
</tbody>
</table>
Figure 1.1 Monthly prevalence estimates of illness in the community. Roles of physicians, hospital, and university medical centres providing medical care to patients 16 years and older.

Source: (White et al., 1961)
Are you training the Doctors of the Future?

What will be role of the doctor in 2020?
Will we even need physicians as we use them now?
The role of Physicians in the next decade

ROLES IN THE FUTURE: CANMEDS Evolved
The Evolution

A Challenge: The uCMG

One of many problems
In 2009, number of unmatched CMGs was 11

Increasing steadily to 46 in 2016 and 68 in 2017

Unmatched CMGs from previous years compete with current year CMGs for total 114 in 2017

April 2017 AFMC Board asked that ARMC ramp up analysis on uCMG issue and report back
CMG and USMG treated equally as relates to being a graduate of a CACMS/LCME accredited school

Grads from all other schools treated equally as International Medical Graduates (IMGs) regardless of country of origin

First iteration of match separate CMG and IMG positions. Second iteration all positions combined. (Québec exception)

No consistency in how policy decisions made in the past
By 2021: 141 current and 191 prior uCMG
UG:PG Ratio from 1.1 to 1.026 to 0.98
## Many Stakeholders, Different Priorities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Priorities</th>
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</thead>
<tbody>
<tr>
<td>Patients</td>
<td>• Right care at the right time and place</td>
</tr>
<tr>
<td>Provincial Governments</td>
<td>• Population health needs</td>
</tr>
<tr>
<td></td>
<td>• Right number, mix and distribution of physicians</td>
</tr>
<tr>
<td></td>
<td>• Return on investment and cost containment</td>
</tr>
<tr>
<td>Learners</td>
<td>• To match to first choice discipline</td>
</tr>
<tr>
<td></td>
<td>• Career choice</td>
</tr>
<tr>
<td></td>
<td>• Flexibility to switch career choice</td>
</tr>
<tr>
<td></td>
<td>• Manageable costs (electives, match interview process)</td>
</tr>
<tr>
<td>IMGs</td>
<td>• Access to PG positions</td>
</tr>
<tr>
<td></td>
<td>• Eligibility to practice in Canada</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Priorities</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| UGME                      | • Quality and breadth of competence in UG learners  
                               • Matched students  
                               • Meaningful, educational electives |
| Student Affairs Offices   | • Access to accurate physician HR data, program selection processes and requirements information  
                               • Balanced student needs, well-being and career management decisions |
| PGME                      | • Quality and breadth of competence in PG learners  
                               • Capacity to train residents  
                               • Flexibility for transfers  
                               • BPAS, selection transparency |
| Residency Programs        | • Best candidate  
                               • Manageable number of applications and interviews |
Provinces making unilateral decisions

Ontario cut 25 CMG positions and considering cutting 25 IMG (on hold)

Québec cutting 17 medical school positions for 3 years

NFLD has no IMG positions in 1st iteration of match
Provinces have created **IMG positions above CMG positions** to assist with physician resource plan.

IMG positions in past 5 years remain steady overall.

In recent past **20% drop in IMG applications** as new IMG assessment criteria/exams introduced.
Faculties Limited in Ability to Support

Faculties not all able to support unmatched CMGs as no longer students of the faculty.

Some uCMGs have no student affairs support or access to electives.

Not all faculties have options for the unmatched such as a delay of graduation and a 5th year
11% of QC grads leave QC, only 1% grads go to QC

<table>
<thead>
<tr>
<th>Year</th>
<th>Rest of Canada Graduates</th>
<th>Quebec Graduates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Matched to Quebec</td>
<td>Matched outside of Quebec</td>
</tr>
<tr>
<td>2017</td>
<td>26</td>
<td>1901</td>
</tr>
<tr>
<td>2016</td>
<td>27</td>
<td>1917</td>
</tr>
<tr>
<td>2015</td>
<td>32</td>
<td>1909</td>
</tr>
</tbody>
</table>
203 CMG positions and 16 (7%) IMG positions are combined. IMGs matched to 34% of positions.

<table>
<thead>
<tr>
<th>Year</th>
<th>1st Iteration Vacancies</th>
<th>2nd Iteration Matches</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>IMG Vacancies</td>
<td>CMG Vacancies</td>
</tr>
<tr>
<td>2017</td>
<td>16</td>
<td>203</td>
</tr>
<tr>
<td>2016</td>
<td>29</td>
<td>184</td>
</tr>
<tr>
<td>2015</td>
<td>21</td>
<td>195</td>
</tr>
<tr>
<td>2014</td>
<td>15</td>
<td>213</td>
</tr>
</tbody>
</table>
More USMGs match to CAN than CMGs match to US

<table>
<thead>
<tr>
<th>Year</th>
<th>Total # of USMGs Matched to Canadian Residency Positions</th>
<th>Total # of CMGs Matched to US Residency Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>24</td>
<td>7</td>
</tr>
<tr>
<td>2016</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>2015</td>
<td>26</td>
<td>17</td>
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<td>2014</td>
<td>27</td>
<td>6</td>
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<tr>
<td>2013</td>
<td>25</td>
<td>14</td>
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<tr>
<td>2012</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td>2011</td>
<td>22</td>
<td>11</td>
</tr>
<tr>
<td>2010</td>
<td>25</td>
<td>18</td>
</tr>
</tbody>
</table>
Progressive reduction in capacity of Faculties to accommodate resident transfers within the faculty, within a province or inter-provincially.

Previously Matched Residents Re-enter the R1 Match as Transfers in the 2nd iteration.

The number of transfers has doubled from 10 to 20 in 3 years. This “displaces” more current year CMGs.
68% of unmatched CMGs are applicants who could match if positions were available.
So what does this mean to U of T?

Size Matters

Innovation Starts Here
New Admissions to Canadian Faculties of Medicine, 2010 - 2016

New Admissions

Canada
U of Toronto

Year
2010
2011
2012
2013
2014
2015
2016

Number of New Admissions
3000
2500
2000
1500
1000
500
0
Graduates of Canadian Faculties of Medicine, 2010 - 2016

Graduates

Canada

U of Toronto

Linear (Canada)

Linear (U of Toronto)

2010

2011

2012

2013

2014

2015

2016

2447

2526

2643

2658

2795

2813

2847

223

223

225

218

246

254

259
First Year Residents in Canadian Faculties of Medicine, 2010 - 2016

- Specialty, Canada
- Specialty, U of Toronto
- General, Canada
- General, U of Toronto

Linear (General, Canada)  Linear (General, U of Toronto)
Confirmed Visiting Electives at University of Toronto
Comparison by year | Canadian and international applicants
Perception that PG selection committees corelate **number of electives** in a discipline and an elective at their site as commitment to the program

Perception that **reference letters** from colleagues in the discipline are **better perceived** by selection committee
Perception, and shift toward, use of **electives to increase match chances** in a specific disciplines decreases diversity.

Risk for students that go **unmatched with limited exposure** to other disciplines.

Concern about **‘unofficial’ electives** taking place on weekends which are not accessible to all students.

**Students incur significant costs** for elective applications.
Residency Program Selection Solutions

UG/PG deans Working Group on electives developing policy on maximum time spent in one discipline

Best Practices in Applications & Selection (BPAS) report created to provide evidence-informed approach to resident selection

Supported by PG deans, UG deans and validated by Program Directors
### Principles
- Selection criteria
- Multiple independent objective assessments
- UG/PG Collaborative planning, applicant performance
- Applicants understanding of HHR considerations
- PG programs consider individual educational needs, value broad clinical experiences and resident diversity

### Best Practices
- Transparency
- Fairness
- Selection Criteria
- Process
- Assessors
- Assessment Instruments
- Knowledge Translation
- Ranking
Metamorphosis: A Journey in Leadership

Lots of Change: What I have learned

Sharing MY Reflections Since 2015
Imposter Syndrome

- Giving your first lecture
- Publishing your first paper
- Taking the job as Program Director
- Chairing your first meeting of Snr Colleagues
- Disciplining/Failing a Learner
- Admitting a Mistake in Public
- Moving On
What was planned, and what happened
Sometimes you just have to Reinvent Yourself

- Maintain your Integrity
- Embrace Complexity.
- Uncertainty and Change Happen
- Keep your Options Open
- Remember – on the way up to acknowledge others – you will see them on the way down
- Be kind
Thank you!
Ask Sarita...