10 YEARS OF DATA ON INTERPROFESSIONAL EDUCATION IN ANATOMY.

Bruce Wainman,
Director, Education Program in Anatomy & Surgical Skills Laboratory,
McMaster University, Hamilton ON.
What should **effective IPE** cause?

- **Long term**
  - Improved patient care and safety

- **Short term**
  - Better understanding of professions (role clarification)
  - Erasing of stereotypes
  - Improved communication
  - Improved conflict resolution
What allows for effective IPE?

- Sustainability
  - Reasonable cost
  - Reasonable staff demands
  - Reasonable physical resource demands
Evaluating Short Term IPE Goals

• There are a couple of tools to evaluate IPE effectiveness but none have been applied systematically to anatomy education.
What’s wrong with (many) IPE events?

• The activities do not always demand enough of the participants
• There is often little emotional or intellectual investment by the students
• Many of the IPE offerings are deadly boring
• Many events are too short
• So let’s give the students:
  – something demanding to do
  – with emotional attachment
  – that is not boring
  – lasts long enough to cause some change.
WHY ANATOMY?
METHODOLOGY

MD, PT, PA, RN, OT, MW students
ANATOMY & PROFESSIONAL OVERVIEW
TEAM DISSECTION
Weekly Course Breakdown:

- 10-15 min anatomy presentation
- 10 min profession presentation
- 25-30 min interprofessional group PBL-style case study discussion
- 1.5-2 hr interprofessional group dissection
Popularity

- A lottery system needed to be implemented to choose the students because of how much interest we had in the course.
Body and Soul: What we come to

Students from a variety of medical programs work together on cadavers in the anatomy lab at McMaster University. The students compare and exchange knowledge they bring to the lab from their own areas of special study. Cathie Coward/Hamilton Spectator
QUANTITATIVE OBJECTIVES (2014)

Does participation in an **IPE gross anatomy course** change the **attitudes and perceptions** of students towards:

- Interprofessional learning?
- Other health care professions?
QUALITATIVE OBJECTIVES (2014)

Does **learning with other health care students** change their views about the other health professions?

Does this course change their understanding of:

- **Anatomy**?
- **Other professions**?
- **Their own profession**?
DATA COLLECTION

• Quantitative

    • Interdisciplinary Education Perception Scale (IEPS)
    • Readiness for Interprofessional Learning Scale (RIPLS)

• Qualitative

  • Post-course intra-professional focus groups 2011 and 2013
• 19 questions, Likert 1-5

• Four subscales
  I. Teamwork & collaboration*
  II. Positive professional identity*
  III. Negative professional identity*
  IV. Roles & responsibilities*
Positive Professional Identity

13. Shared learning with other health care students will help me to communicate better with patients and other professionals.

14. I would welcome the opportunity to work on small-group projects with other health care students.

15. Shared learning will help to clarify the nature of patient problems.

16. Shared learning before qualification will help me become a better team worker.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-course</th>
<th>Post-course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Professional Identity</td>
<td>4.33 ± 0.53</td>
<td>4.52 ± 0.50*</td>
</tr>
</tbody>
</table>

Means ± SD. Statistically-significant change identified p≤0.05. N=124.
Roles and Responsibilities.

17. The function of nurses and therapists is mainly to provide support for doctors.

18. I’m not sure what my professional role will be.

19. I have to acquire much more knowledge and skills than other health care students.

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-course</th>
<th>Post-course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roles &amp; Responsibilities</td>
<td>2.33 ± 0.70</td>
<td>2.07 ± 0.65*</td>
</tr>
</tbody>
</table>

Means ± SD. Statistically-significant change identified p≤0.05. N=124.
All RIPLS Scores Improved Significantly

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-Course ± SD</th>
<th>Post-Course ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork &amp; Collaboration</td>
<td>4.52 ± 0.41</td>
<td>4.69 ± 0.34*</td>
</tr>
<tr>
<td>Negative Professional Identity</td>
<td>1.61 ± 0.57</td>
<td>1.47 ± 0.54*</td>
</tr>
<tr>
<td>Average Pre-Post Difference (+/ - SD)</td>
<td>Teamwork and Collaboration</td>
<td>Positive Professional Identity</td>
</tr>
<tr>
<td>-------------------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td><strong>MD</strong></td>
<td>0.13 (0.45) α</td>
<td>0.07 (0.56)</td>
</tr>
<tr>
<td><strong>MW</strong></td>
<td>0.11 (0.40)</td>
<td>0.23 (0.62)</td>
</tr>
<tr>
<td><strong>OT</strong></td>
<td>0.10 (0.42)</td>
<td>0.28 (0.56) α</td>
</tr>
<tr>
<td><strong>PA</strong></td>
<td>0.10 (0.27)</td>
<td>0.23 (0.46) α</td>
</tr>
<tr>
<td><strong>PT</strong></td>
<td>0.24 (0.33) α</td>
<td>0.27 (0.42) α</td>
</tr>
<tr>
<td><strong>RN</strong></td>
<td>0.11 (0.42)</td>
<td>0.25 (0.52) α</td>
</tr>
</tbody>
</table>
IEPS SUBSCALES (2014)

• 18 questions; Likert 1-6

• 3 subscales
  I. Perception of Actual Cooperation
  II. Perceived Need for Cooperation
  III. Competency & Autonomy
Perception of Actual Cooperation

12. Individuals in my profession are well-trained

14. Individuals in my profession are willing to share information and resources with other professionals

15. Individuals in my profession have good relations with people in other professions

16. Individuals in my profession think highly of other related professions

17. Individuals in my profession work well with each other

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-course</th>
<th>Post-course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception of Actual Cooperation</td>
<td>5.13 ± 0.52</td>
<td>5.25 ± 0.55*</td>
</tr>
</tbody>
</table>

Means ± SD. Statistically-significant change identified p≤0.05. N=124.
## IEPS Scores

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Pre-Course ± SD</th>
<th>Post-Course ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Need for Cooperation</td>
<td>5.71 ± 0.48</td>
<td>5.74 ± 0.41</td>
</tr>
<tr>
<td>Perception of Actual Cooperation</td>
<td>5.13 ± 0.52</td>
<td>5.25 ± 0.55*</td>
</tr>
<tr>
<td>Competency &amp; Autonomy</td>
<td>4.98 ± 0.74</td>
<td>5.23 ± 0.69*</td>
</tr>
</tbody>
</table>

Competency and Autonomy Statements:
Team working skills are essential for all healthcare students to learn
Shared learning will help me to understand my own limitations
<table>
<thead>
<tr>
<th>Group</th>
<th>Subgroups</th>
<th>Autonomy and Competency (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RN</td>
<td></td>
<td>0.29 (0.80)</td>
</tr>
<tr>
<td>Pt</td>
<td></td>
<td>0.26 (0.63)</td>
</tr>
<tr>
<td>PA</td>
<td></td>
<td>0.18 (0.38)</td>
</tr>
<tr>
<td>OT</td>
<td></td>
<td>0.31 (0.50)</td>
</tr>
<tr>
<td>MW</td>
<td></td>
<td>0.10 (0.66)</td>
</tr>
<tr>
<td>MD</td>
<td></td>
<td>0.32 (0.88)</td>
</tr>
</tbody>
</table>
Qualitative Results
Results

Four main themes:

1. Learning about self & others
2. Learning about anatomy
3. Experiencing the benefits of a longer duration IPE initiative
   - Developing pride in one’s profession
   - Developing faith in others
4. Going forward
“Through this interaction, I managed to learn the different scopes of practice of the different professions really well. Not just in a superficial sense, but in a very collaborative way: this is what we do and this is what we specialize in and this is when you can refer to us. I think this was really valuable.” (MD)
“They (other pre-licensure students) are coming from a different perspective and it is forcing me to kind of go back and look into my own...and what I know about my profession or future profession.” (MD)
Learning About Self & Others

“I definitely learned the difference between PTs and OTs…and it is not just a letter in the alphabet.” (RN)

“I think it is very helpful to be part of a healthcare team…since we work closely with MDs and RNs and are expected to work with OTs, PTs, speech pathologists, etc. Having interacted with people in these anatomy groups really helped.” (PA)
Learning About Anatomy

“It was definitely helpful to dissect in an IP team...I hate muscle anatomy and I’m really bad at it but the PTs and OTs had experience with it and they made relearning some of the muscles really kind of fun...a lot of it has actually stuck with me.” (MD)

“I think that having a prosection approach and a dissection approach combined was very valuable.” (MD)
Experiencing The Benefits of a Longer Duration IPE Initiative

“The more longitudinal IPE initiative allows you to develop relationships and rapport with each of the other professionals on the team which I would not encounter in any other setting. That was really valuable in developing an IPE mindset.” (MD)

“The biggest thing was building relationships and opening lines of communication with people from each professions.” (PT)
Developing Pride in One’s Profession

“I found myself really proud to be a midwife...positive reactions, and seeing people learning and taking a keen interest in my profession...It made me proud of what I’m doing and what I’ve chosen to do with my career and my life.” (MW)
Developing Faith in Others

“Learning everyone else’s role and knowing that there is that continuity of care was something that I took away from this. When I start practicing, knowing that I have faith in what other healthcare providers do, and knowing that we can all work together to make the patient better...” (MD)
Going Forward

“What will I do differently as a result of this course? I will consult actively.” (MD)

“I think after being in this course and discovering how easy it can be to actually include other healthcare professionals in your treatment if you seek them out...I will definitely, whenever possible, consult other healthcare professionals.” (OT)
Analysis

- Highly valuable from both an educational and interprofessional aspect
- Increased role clarity
- Increased pride & faith
Is IPE Effective in the Long Term?

• For the thousands of studies of IPE there are only about 15 studies that attempt to measure long term change (Cochrane Review, 2013)
  – For all 15 studies looking at long term outcomes the evidence quality was low or very low.
  – Seven studies measure improved patient outcomes, 4 measured mixed outcomes and 4 showed no effect.
  – These were trials of an IPE intervention against nothing.
Long Term Impact?

- Contacted past participants of the dissection IPE course
- Modified Readiness for Interprofessional Learning Scale (RIPLS)
- Compared with their own post-course quantitative data
“The idea of dissection a human body is in itself incredibly memorable. With that said, the *most memorable* aspect of the course was easily the opportunity to meet and interact with other professional school students. There is often a divide between students from different professional programs which interestingly may be tied to the ever-present medical hierarchy. The chance to find out what other professionals do and respect their experiences/contributions to healthcare was great!”

“I am now a physician assistant working in neurosurgery. In this practice, I manage a lot of chronic low back pain. In this practice, we strongly recommend physiotherapy, massage therapy, etc. I have a better understanding of the type of training physiotherapists have, in general, the type of treatments they can offer, etc.”

“It was longitudinal and allowed students to work together toward common learning goals. It allowed us to learn from one another - each of us already developing our own area of expertise and willing to share it. Being longitudinal, it fostered relationships over time. This is much different from the traditionally short interactions we get in most IPE learning sessions.”
Results

Quantitative analysis revealed a significant decrease in their attitude towards teamwork and collaboration and respect for other health professions.

A significant improvement was seen in their understanding of roles and responsibilities compared to their results immediately after the IPE intervention.
Conclusions

- Past participants still remember the course and how much they enjoyed it, some of whom took it almost 5 years ago.
- While our course did leave an impression, it doesn’t seem to have lasting long-term effects.
- The clinical environment may play a role in shaping attitudes and perception towards IPE.
Using Q Methodology to Determine Student Perceptions

- Disconnect between quantitative and qualitative
- Q-methodology is great for working out perceptions
- Participants loved the course, but was it just because of the anatomy?
Methods
Q-sample

• Statements derived from qualitative feedback of previous years

• 43 statements reflected four themes:
  – Interprofessional education - with others
  – Interprofessional education – perceptions of self
  – Course structure
  – Course content
Certain students dominated the dissection and didn’t allow others to work.

Because of this course I will be more likely to advocate for IPE.
Methods

Analysis

• Centroid factor extraction with varimax rotation
Results

Study Group (N = 26)

- Group 1
- Group 2
- Group 3

Anatomy

IPE Enthusiasts

Skeptical IPE Anatomists

Practical IPE Advocates
### Results:
#### Program Distribution

<table>
<thead>
<tr>
<th>Program</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicine</td>
<td>6</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Midwifery</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Nursing</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Physician's Assistant</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Physiotherapy</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>17</strong></td>
<td><strong>5</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>
Factor 1: Anatomy IPE Enthusiasts

- 17 students loaded on this factor (9 females and 8 males):
  - 6 MD
  - 1 Midwifery
  - 3 Nursing
  - 3 Physician Assistant
  - 4 Physiotherapy
### Factor 1: Distinguishing Statements

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Different members of my team brought different anatomical knowledge and they guided me through the material I was not comfortable with.</td>
<td>4</td>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>18</td>
<td>I feel that dissection provided better hands-on learning opportunities than prospection.</td>
<td>4</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>38</td>
<td>This program highlighted the different expertise that each member brings to the interprofessional team.</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>Overall, the tutors provided great guidance during the dissections.</td>
<td>3</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>37</td>
<td>I felt that certain students dominated the dissection and prevented my learning.</td>
<td>-4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>I did not get a fair chance at the cadaver during the dissections.</td>
<td>-4</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>
Factor 2: Practical IPE Advocates

- 5 students loaded on this factor (all females):
  - 1 Midwifery
  - 3 Occupational Therapy
  - 1 Physician Assistant
## Factor 2: Distinguishing Statements

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>Because of this course, I think I will be a much stronger advocate for interprofessional teams in the future.</td>
<td>2</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>39</td>
<td>I missed important anatomical details during dissection.</td>
<td>-3</td>
<td>4</td>
<td>-2</td>
</tr>
<tr>
<td>30</td>
<td>Learning with students from different disciplines helped me gain a solid understanding of my role in the context of other health care professionals.</td>
<td>1</td>
<td>3</td>
<td>-4</td>
</tr>
<tr>
<td>33</td>
<td>Working in an interprofessional team reminded me of the importance of client-centred care.</td>
<td>0</td>
<td>-3</td>
<td>-1</td>
</tr>
<tr>
<td>17</td>
<td>My experiences in this program broke down medical stereotypes.</td>
<td>0</td>
<td>-4</td>
<td>-1</td>
</tr>
<tr>
<td>25</td>
<td>I think a lot of the benefits of working with the interprofessional team would still occur if I had worked in a group of students from my program only. Working as part of a team is the important part – it does not matter if it is an interprofessional team or not</td>
<td>-2</td>
<td>-5</td>
<td>0</td>
</tr>
</tbody>
</table>
Factor 3:
Skeptical IPE Anatomists

- 4 students loaded on this factor (3 female and 1 male):
  - 3 MD
  - 1 Midwifery
### Factor 3: Distinguishing Statements

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>I found that interdisciplinary collaboration was not important for some cases</td>
<td>-2</td>
<td>-2</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>My perceptions of my role in the health care team did not change throughout the course</td>
<td>-2</td>
<td>-1</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>Different members of my team brought different anatomical knowledge and they guided me through the material I was not comfortable with</td>
<td>4</td>
<td>1</td>
<td>-3</td>
</tr>
<tr>
<td>30</td>
<td>Learning with students from different disciplines helped me gain a solid understanding of my role in the context of other health care professionals</td>
<td>1</td>
<td>3</td>
<td>-4</td>
</tr>
<tr>
<td>40</td>
<td>I better understand the limitations of my scope of practice as a result of working with other members of my interprofessional group</td>
<td>0</td>
<td>-1</td>
<td>-4</td>
</tr>
</tbody>
</table>
## Consensus Statements

<table>
<thead>
<tr>
<th>#</th>
<th>Statement</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Informal conversations with my group members helped me build an understanding of the different professional roles.</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>31</td>
<td>I learned more about the different scopes of practice because I learned in an interprofessional group.</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29</td>
<td>I really benefited from this interprofessional experience happening over a long period of time.</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>32</td>
<td>I learned about the body systems that work together in a holistic approach, rather than about specific anatomy.</td>
<td>-1</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>26</td>
<td>I felt that doing dissection was a waste of time.</td>
<td>-5</td>
<td>-5</td>
<td>-5</td>
</tr>
</tbody>
</table>
Conclusions

• The vast majority of the class want very few changes to the curriculum
• Time together, informal conversation and dissection are key.
• We have to work harder to emphasize roles and responsibilities of each profession for the small groups that miss that key point
Was it Sustainable IPE?

- Dissectors
- Facilitators
- Analysts
Reasonable staff demands?

• Approximately 70 hrs of staff required.
• Faculty were invited to volunteer to help with sessions.

Reasonable physical resource demands?

• Everything happened from 6-9 pm so the lab was generally unoccupied.
### Reasonable Costs?

<table>
<thead>
<tr>
<th>Staff (83hrs)</th>
<th>Consumables</th>
<th>Cadavers (4x)</th>
<th>Scrubs and t-shirts</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3,150$</td>
<td>$1250$</td>
<td>$8,600$</td>
<td>$800$</td>
<td>$13,800$</td>
</tr>
</tbody>
</table>

431$ p.p. (for dissectors, about 360$ p.p. for all participants)

1080 hours of IPE time

12$ hour for IPE time.
RIPLS and IEPS the best tools available, but imperfect

- Data is sufficiently powered by pooling data
- Likert scale format limits potential degree of change

- Q Methodology provides detailed insight into the course strengths and weaknesses.

- Long term changes are not sustained but the event it recalled as being excellent IPE

The event meets the standards for sustainability, facility demands and cost.
Acknowledgements

Andrew Palombella

Dr. Jenn Salfi

Dr. Alisha Fernandes

Eric Zheng

Jasmine Rockarts

Chelsea MacKinnon
References


SAVE THE DATE FOR OUR UPCOMING REGIONAL MEETING
Saturday, November 10, 2018
McMaster University | Hamilton, Ontario, Canada

MACANATOMY

SURGICAL SKILLS CENTRE