To Dissect or not to Dissect…

That is the question (or is it)

Historical perspective of cadaveric dissection

(+) Time honored tradition

(+) Historically been the preferred mode of instruction (Patel KM et al., 2006; APTA, 2002)

+ observation of anomalies

+ 3-d perspective

+ respect for the human form (Aziz M et al.,2002)

(-) Advances in medical technology raise concerns regarding adequacy of cadaveric dissection alone

(-) Rising costs, shortage of qualified instructors, concern re formaldehyde exposure

Pros and Cons of "Modern" Modes

- Prosections:
  - + 3D realistic structures, ↓time (students), re-usable, ↓space required; student preferences (dissection over prosection)
  - - tissue layers, relationships between regions; ↑time (faculty); less "exploration" and variety for students than dissection; H &S
- Models/plastination:
  - + convenience, re-usable, ↓H & S, can be semi-3D
  - -3D, true representation, variation, texture
- Digital media:
  - + convenient, accessible, efficient; ↓H & S, space, or religious concerns; "impressive"; cost?
  - -not true 3D; variability, accuracy, realism, tissue integrity; cost?
- Living Anatomy: + but probably not enough by itself

WHAT DOES THE EVIDENCE SAY?

Dissection vs Computer Assisted Instruction & Prosection

- Plack MM, 2000
  - Use of computer assisted instruction (CAI) and prosections compared to traditional instruction
    - No difference in mean practical, written or final course grades between groups

Dissection vs Digital media

- Peterson DC, et al., 2016
  - Traditional v traditional + supplemental 3D resources
    - 3d enhanced group demonstrated:
      - Significant improvement in overall scores ($p < 0.01$, 99% CI 1.8%, 5.9%)
      - Significant improvement in cadaver related questions but not lecture-based question

Digital Dissection v Digital Media

- Lombardi SA et al., 2014
  - Compared one session of instruction with plastic model, organ dissection or virtual dissection
    - Organ dissection and model groups performed significantly better on anatomy questions that did the virtual dissection group

Dissection vs Hybrid approach

- Wilson AB et al. 2011
  - Compared alternating dissection with peer teaching to more traditional dissection approach
    - No significant differences in course grades between groups

Summary of Comparisons

- Level 1 evidence:
  - Meta-analysis (Wilson AB et al., 2018)
    - No effect on short-term outcome gains when comparing traditional dissection to other modes of instruction (prosection, digital media, models, hybrid)

Challenges with current literature

- Heterogeneity of outcomes assessed
- Heterogeneity of delivery methods

Gaps in the literature

- What is the effect of various instructional methods and/or “best practice” on long-term information retention?
- Does dissection facilitate development of ancillary skills better than other methods?
  - Teamwork, stress management, empathy (Bockers A et al., 2010)
- What is the effect of emotion on learning through cadaveric dissection vs other methods?
  - Surprise and wonderment with ID of anomalies and/or pathology (Korf HW et al., 2008)
  - Respect for human form (McBride and Drake, 2015)

Best Education Practices Defined

- *"wide range of individual activities, policies, and programmatic approaches to achieve positive changes in student attitudes or academic behaviors"* David Arendale, Ph.D., EOA National Best Practices Center Manager and Associate Professor, University of Minnesota, http://www.besteducationpractices.org/what-is-a-best-practice/
- Includes:
  - Promising education practice (innovative technologies)
  - Validated education practice (frequent low stakes assessment, active learning)
  - Exemplary education practice (cadaveric dissection)

Examples

- Chapman: horizontal and vertical integration
  - Semester 1: multiple modalities, including prosections; clinical reasoning/application; lab "stations"
  - Semester 6: (after ICE and 1 FT clinical rotation, most didactic and basic science courses); full body dissection + special project; heavy on clinical application
- Drexel: horizontal and vertical integration
  - Year 1: full body dissection; prosected joints, images, bone boxes
  - Year 2: return trips to lab to review joint anatomy within orthopedic courses (UE, LE, spine)

Future Directions

- Standardization of what to teach
  - Must know
  - Nice to know
- Standardization of outcomes
- Determining best practice within the confines of resources

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