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
References


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