



Transform 2021

Emerging Solution

 American Association
of Colleges of Nursing
The Voice of Academic Nursing


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Enhancing Nursing Education with Innovative Technology

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Education is not static but an evolving process that requires continuous adaptations and reflection. The days of passive lectures are behind us. Our consumer desires innovative use of technology, meaningful feedback, evidence-based teaching modalities, and cost-effective resources to enhance their learning experience. This session will demonstrate innovative technology to enhance foundational anatomical concepts required for clinical application.

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About Me

Education

- B.S. Health & Exercise Science from University of Oklahoma
- DPT from Hardin-Simmons University
- PhD Medical and Health Professions Education with a concentration in Contemporary Human Anatomy Education
 - Estimated Completion 2023

Clinical

- Early Childhood Intervention, inpatient, outpatient, acute, neonatal intensive care unit



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Teaching Experience

- **Doctor of Physical Therapy Program**
 - Human Anatomy with cadaver dissection (2 semester)
 - Neuroscience I & II
 - Pediatrics
- **Masters of Physician Assistant Program**
 - Human Anatomy with cadaver dissection
 - Physiology & Pathophysiology I/II
- **Family Nurse Practitioner Program**
 - Human Anatomy with cadaver dissection
- **Masters of Occupational Therapy Program**
 - Human Anatomy with virtual dissection
- **Biology Department**
 - Anatomy & Physiology I/II
 - Advanced Anatomy with virtual dissection
 - Advanced Physiology with case based learning



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Disclosure

I have no financial disclosure or conflicts of interest with the presented material in this presentation.



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Learning Objectives

- **By the end of this presentation the learner will be able to:**
 - Identify current limitation of undergraduate anatomy education.
 - Explain the function of the structural protein dystrophin in correlation to Duchenne Muscular Dystrophy.
 - Predict the influence of systemic hypertension on filtration occurring at the glomerulus.
 - Understand the reason for a heart murmur following an anterior interventricular artery occlusion.
 - List four innovative anatomical resources that can be used to enhance nursing education.



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Current Trends

- **Shortened anatomy curriculum** (Benninger et al., 2014)
- **Transition away from cadaver dissection even though still gold standard** (Robertson et al., 2020)
- **Perception of clinicians that anatomy is insufficient** (Roxburgh & Evans, 2021)
- **Undergraduate anatomy is not adequately preparing students for success in graduate anatomy coursework** (Kondrashov et al., 2017)



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Student Perception

- **My undergraduate anatomy coursework adequately prepared me for success in graduate level anatomy.**
 - PT & PA 1st and second year students
 - 94/107=87.85% response rate
 - **62.77%** answered 3 or lower on a 5-point Likert scale
 - 37.23% answered 4 or higher on a 5-point Likert scale
- **Family Nurse Practitioner student feedback**
 - “it amazes me that this course is not required for all nursing students”
 - Course: Clinically Applied Human Anatomy with Cadaver Dissection



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What is the disconnect?

- **Mere memorization with lack of application**
 - Poor retention
- **Significant amount of variability in undergraduate anatomy experience**
 - Repetition must match assessment (Connolly, 2017)
- **Multi-layered learning**
 - Students must be exposed throughout entire curriculum



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Essentials 2021

- “Nursing graduates, particularly at the advanced nursing practice level, must be well-prepared to think ethically, conceptually, and theoretically to better inform nursing care.”
- “Advances in learning approaches and technologies, understanding of evolving student learning styles and preferences, and the move to outcome-driven education and assessment all point to a transition to competency-based education.”
 - Knowledge & Eptitude
- “basic informatics competencies are foundational to all nursing practice”



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Innovative Technology

How do we integrate technology across multiple courses without breaking the bank?



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Muscle? Action? Innervation? Attachment?

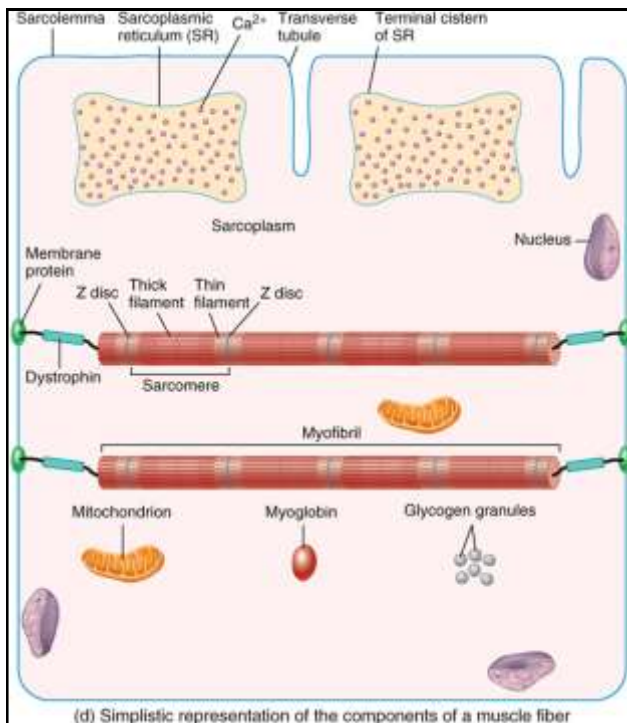
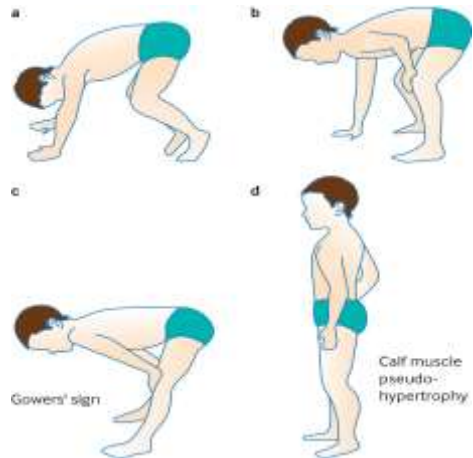


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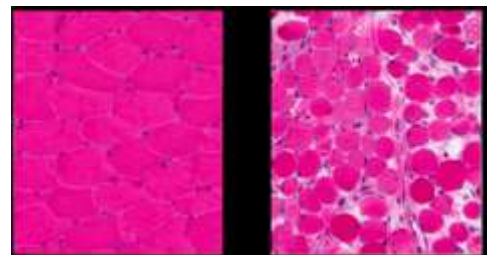
Case Scenario 1

5 year old male

- Proximal muscle weakness
- Difficulty rising to stand
- Calf hypertrophy
- Frequent falls
- Waddling gait



Dystrophin



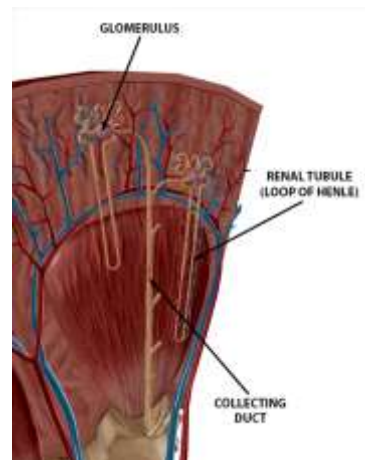
Duchenne Muscular Dystrophy

- **X-Linked recessive disorder**
 - Males
 - 3-5 years of age for diagnosis
 - Compromised independent ambulation after 12 years
- **Proximal muscle wasting**
 - Gowers maneuver
 - Pseudohypertrophy
 - Waddling gait
 - Falls



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Structure? Function?

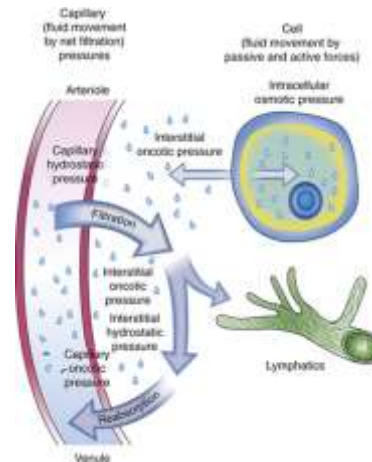


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Case Scenario 2

• 65 year old

- Elevated blood pressure
- Puffiness in face in the morning
- Edema in ankles
- Frequent nighttime urination
- Hematuria
- Proteinuria



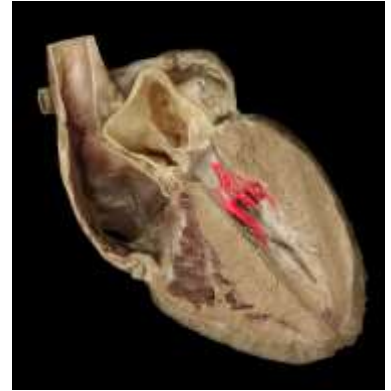
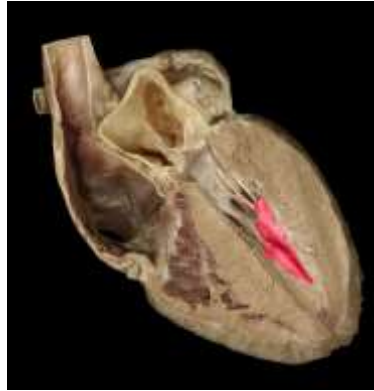
Glomerulonephritis

• Disease injure glomeruli within the kidneys

- Filtration unit of blood
- Impaired ability to get rid of waste and excess fluid



Structure? Function?



What is this structure?



Case Scenario 3

- **Patient presents**

- 3 months post cardiac bypass due to “widow maker”
- Heart auscultation reveals murmur at 5th intercostal space at midclavicular line



Virtual Cadaver Dissection

- Definition
- VIBE solution
- Resources
- Cost



Virtual Cadaver Dissection

- **What is it?**
 - Utilization of technology to enhance anatomy education
 - Web-based platforms
 - Video and image study
 - Applications
 - Augmented Reality
 - Virtual Reality
- **Why use it?**
 - Student perception and reduced anxiety
 - Legal and financial limitations
 - Versatility across multiple courses

VIBE Solution

- Interactive whiteboard
- Remote Collaboration
- Versatility
- VIBE software
 - LMS Canvas/blackboard
 - Web browser
 - Zoom
 - Onedrive
 - Microsoft PPT, Word, Excel
 - Annotation



VIBE Board Cost Comparison

- Vibe Smartboard 55"
 - \$2,999
 - *offer discount with multiple purchase
- Vibe Smartboard 75"
 - \$6,999
- Vibe Stand
 - \$500
- Display 2 Go Stand
 - \$423.99 (quantity 1-4)
 - \$381.99 (quantity 7-21)
- 8 VIBE boards and stands
 - $23,992 + 3,055.92 = 27,047.92$
- Similar concepts
 - \$68,000 per board
 - Multiple by 8
 - \$544,000

Resource Cost

- **Anatomy & Physiology Revealed 4.0**
 - \$51 for 2-year access
- **4D Anatomy**
 - Personal \$99 per year; institution contact for pricing
- **Visible Body Human Anatomy Atlas**
 - \$24.99
- **BlueLink University of Michigan Medical School**
 - Free



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Demonstration

Vibe Board



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A wide-angle photograph of a campus building with a prominent triangular pediment, set against a dramatic sunset sky with orange and purple hues. The foreground is filled with green trees and a lawn. The word "Questions?" is overlaid in large, white, bold, sans-serif font in the center of the image.

Questions?



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