A Competency Model for Humanistic & Communication Education of Pre-Clinical Osteopathic Medical Students Utilizing Standardized Patients and Technology

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ASSOCIATE DEAN OF SIMULATION AND EDUCATIONAL TECHNOLOGY
VIRGINIA • CAROLINAS • AUBURN
Objectives

Participant will understand the advantages of the multi-campus centralized simulation server system

Participant will understand the capabilities of a centralized simulation server system in support of academic partners (medical colleges, hospitals, emergency medical services training centers, nursing schools)

Participant will understand VCOM’s Humanistic Educational Model

Participant will understand Evaluation and Monitoring of Student Performance of the Humanism Categories Utilizing an Interactive Learning Management System

Participant will understand VCOM’s Communication Educational Model (Medical Presentations) Utilizing a centralized simulation server and an interactive learning management system
Edward Via College of Osteopathic Medicine
Simulation Centers and Academic Partners

Public/Private Affiliations

1100 Pre-Clinical OMS I & II
VCOM Simulation Centers 2014

Virginia Campus

- 2nd floor - Knollwood Building 11,000 square feet
- 10 Multipurpose Rooms – OMM, Standardized Patient (SP),
- 4 High-Fidelity Simulation Rooms with Direct View
- High Technology Adult, Maternal, Newborn & infant Simulators
- Analog cameras/audio with digital archiving to in house Server with WEB casting*
- Lecture Room/Debrief Room
- Cadaver-Based Procedural Skills - Anatomy Lab

Auburn Campus – 2015
20,000 sq. ft.

- 3rd Floor Main Campus Building, 20,000 Sq. Ft. “THE BUILDING”
- 11 Multipurpose Rooms SGR & SP Rooms
- 4 High Fidelity Simulation Rooms with Direct View & Public view
- Reception Area
- High Technology Adult, Maternal & Infant Simulators
- Networked/Switchable, In House Server, IP Cameras, AV switching, Digital Archiving & Streaming, Webcasting *
- 3 seminar rooms
- Cadaver-Based Procedural Skills - Anatomy Lab

Carolinas Campus
Central Server System for 3 Campuses
Simulation/Course Curriculum Content Building and Sharing
Administration and Monitor Direct Remote Viewing of Events
Reduction in Workload
Significant Reduction in Hardware Required
Allows for Anatomy and OMM to Centralize Files
3 Campus Educational Research with Centralized Data Center
Facilitates and Functionalizes Curriculum to Academic Partners

Director of Standardized Patient
Director of Manikin-Based
Director of Procedural Skills
Director of Cadaver-Based
Chair of OMM
Chair of Anatomy

Eliminates Siloes

Cloud Storage

Virginia Campus

Central Server

Carolinanas Campus

Auburn Campus

1 GB

1 GB

• Manages Student Evaluation Data
• Manages Curricular Content
• Archives Video (Digital)
• Robust Statistical Package

Academic Partners
NBOME Competency Domains

1. Osteopathic Philosophy/Osteopathic Manipulative Medicine
2. Osteopathic Patient Care
3. Application of Knowledge for Osteopathic Medical Practice
4. Practice-Based Learning & Improvement in Osteopathic Medicine
5. Interpersonal & Communication Skills in the Practice of Osteopathic Medicine
6. Professionalism in the Practice of Osteopathic Medicine
7. Systems-Based Practice in Osteopathic Medicine
The NBOME COMLEX-USA examination series provides the **pathway to licensure** for osteopathic physicians in the United States, and is a **graduation requirement** for earning a DO degree from colleges of osteopathic medicine.

- COMLEX Level 1
- COMLEX Level 2-CE (Cognitive Exam)
- **COMLEX Level 2-PE Standardized patients-OMM, Medical Knowledge & Humanism**
- COMLEX Level 3

[www.nbome.org](http://www.nbome.org)
Continuous Curriculum Improvement and Standardized Patient Build

- Associate Dean of Simulation
- Director of Standardized Patient
- System Content Advisor
- Humanistic Expert
- Chair of Family Medicine
Pre-Clinical OMS I & II Cases
Block Capstone Evaluation

- Block 1 – Communication and Ethics
- Block 2 – Musculoskeletal
- Block 3 – Neurology
- Block 4 – Cardio-Pulmonary
- Block 5 – Gastrointestinal
- Block 6 – Renal GU
- Block 7 – Summative Review
- Block 8 – Presentation (Communication Medical Terminology)

Increased Emotional Concepts introduced through the blocks
- Anger
- Confusion
- Denial
- Ethical Complexities
- Irritability
- Refusal
VCOM Standardized Patient Program

SP Exam Flow:
- 14 minute encounter recorded with patient
- 9 minute typed SOAP note

SP Case Types:
- Acute
- Chronic
- Health Promotion and Disease Prevention
- Osteopathic Manipulative Medicine

Grading

Biomedical/Biomechanical Domain:
- Osteopathic Principles and/or Osteopathic Manipulative Treatment
- History-taking and Physical Examination Skills
- Integrated Differential Diagnosis and Clinical Problem-Solving
- Documentation and Synthesis of Clinical Findings (SOAP Note Format)

Humanistic Domain:
- Physician-Patient Communication, Interpersonal Skills, and Professionalism
Student Medical Learning Objectives

VCOM Course: Osteopathic Manipulative Medicine/Principles of Primary Care

Medical Categories:
1. History
2. Physical
3. Assessment
4. Plan
Humanistic Categories:

- Opening Encounter
- Interviewing and Collecting Information
- Personal Manners/Clinical Courtesy
- Rapport
- Information Delivery and Counseling
- Closure
Humanistic Categories with Elements
6 Categories with 25 elements

Category 1: Opening Encounter
Introduction
Confirmation of patient’s name and name preference

Category 2: Interviewing and Collecting Information
Logical order of questioning
Appropriate use of open-ended questions
Clarity of questions and language
Pace of interview
Listening skills

Category 3: Personal Manners and Clinical Courtesy
Permission to touch
Assisting patient and sensitivity to discomfort
Exposing patient respectfully
Personal space
Appropriate attire and hygiene

Category 4: Rapport
Eye contact
Attentiveness
Professional demeanor
Confidence
Addressing patient’s concerns
Nonjudgmental
Praising patient

Category 5: Information Delivery and Counseling
Clarity of information
Pace and tact
Discussion of patient’s support system
Treatment plan and patient’s agreement

Category 6: Closure
Follow-up
Questions
### Standardized Patient Training

- **3 Provoking statements**
- **30 medical education points**
- **Demographics**
- **Dress**
- **Emotional State**

**Trained by:**
Director of Standardized Patient  
Chair of Family Medicine  
Ph.D. Humanistic Expert

**Script Practice**  
Mock SP  
Monitoring day of exam

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| Confidential  
Block 4 Class of 2017  
Case A Chest Pain  
Standardized Patient Training Sheet  
Test Date: June 24th, 10:30 – 5:00 and June 25th, 2014 10:30 – 5:00  
Arrive at the Simulation and Technology Center 30 minutes prior to the test start. |
|---|

**To ensure that the students receive the same scenario, please do not deviate from this script. These are 3rd year medical students. They will receive 30 minutes in the room during the encounter.**

**Session 4.00 PM Pm Purney Care Office**

**Name and Age:** Mr. or Mrs. King - 65 years of age

**Chief Complaint:** “My chest really hurt today.”

**When did the pain start?** It was about two hours ago.

**What were you doing when the pain started?** I was going up the stairs.

**Would you point to the location where you had the pain?** Right here (fist clenched fist in the middle of the chest)

**How long did the pain last?** It lasted about an hour.

**Can you describe this pain?** It was like a squeezing sensation with a lot of pressure.

**If you had to rate the pain on a scale of 0-10 (10 the worst)?** 7.5 at the time but now is a 0

**Did the pain radiate?** Yes, to my left arm and neck area and down my left arm.

**Was there anything that brought this on? No, not to my knowledge. I don’t know maybe walking up the stairs... I get a little “vented.”**

**Have you had anything like this before? No**

**Did anything make the pain better?** Resting

**Did anything make the pain worse?** No

**Do you have any other medical problems?** I have high blood pressure and high cholesterol levels.

**How long have you had high blood pressure?** 10 years

**How long have you had high cholesterol levels?** 10 years
Monitor Checklist

1. Did the Standardized Patient give the correct chief complaint without volunteering any additional information?
2. Did the Standardized Patient give historical data based on the script?
3. Did the Standardized Patient give the provoking statements based on the script?
4. Did the Standardized Patient portray the physical findings based on the script?
5. Did the Standardized Patient portray the findings of special testing based on the script?
6. Did the Standardized Patient answer the student doctor's questions in a timely manner without additional comments?
Standardized Patient Inter-Rater Variability

- Inter-Rater Variability (Z-Scores)
  - Z = Raw Score-Mean/SD
    - Green greater than 1.1
    - Red less than -1.1
  - Ph.D. Human performance expert monitors SP grade sets
Grading Scale (1.5 SD Adjusted 70 Scale)

- Grading Scale may be applied to Composite or by the 6 Categories

- 1.5 Standard Deviation = Results in lower 7% of class

- Assumption: Capturing 7% of the class will capture the most likely 5% of those that will have difficulty on NBOME COMLEX PE

- Adjusted 70: if the 1.5 Standard Deviation hits above 70%, then only those below 70% are subject to remediation

- Scoring System:
  - 0 – 69 “Poor”
  - 70 – 84 “Needs Improvement”
  - 85 – 100 “Proficient”
Control Room

- Operated by Healthcare Simulation Operations Specialist (HSOS)
- Monitors all rooms audio/video
- Time management and Exam Flows
- Two way intercom between all rooms
- Overhead announcements
Exam Room Setup

Student EMR System

SP EMR System
Multipurpose Room
2 pan/tilt cameras
SP Encounter
Student Terminals and EMR’s

Pre-Clinical OMS’s Standardized Patient Open Architecture

Post-Graduate (residents) Practicing Physicians Advanced Template of EMR
Category and Element Analysis (P-Value & Pt. Biserial)

Humanistic Curriculum Improvement

**Element 9:** Student doctor made appropriate eye contact most of the time, writing interfered with patient relationship, patient felt comfortable with the student doctor most of the time

**Element 12:** Student doctor inconsistently recognized the patient concerns, inconsistently used reassuring words, inconsistently legitimized patient concerns
Individual Student Improvement

Humanism Grade

- Needs Improvement Category & Element Report
  - Modules Mandatory for Review
  - Meet with Ph.D. Humanistic Expert
  - Re-Test Standardized Patient Encounter

Proficient Category & Element Report

Optional Module Review

Poor Requires Remediation
Humanistic Category Report and Module Tracking

Performance Report

<table>
<thead>
<tr>
<th>Humanistic Category</th>
<th>Student’s Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Opening Encounter</td>
<td>Proficient</td>
</tr>
<tr>
<td>2. Interviewing and Collecting Information</td>
<td>Needs Improvement</td>
</tr>
<tr>
<td>3. Personal Manners and Clinical Courtesy</td>
<td>Proficient</td>
</tr>
<tr>
<td>4. Rapport</td>
<td>Proficient</td>
</tr>
<tr>
<td>5. Information Delivery and Counseling</td>
<td>Needs Improvement</td>
</tr>
<tr>
<td>6. Closure</td>
<td>Proficient</td>
</tr>
</tbody>
</table>

How do you manage a student’s category and element deficiencies even though they may have had a passing composite humanistic score?

Individualized Student Performance Report from Centralized Simulation Server

Follow Student Performance in Interactive Learning Management System
Interactive LMS Humanism Modules

Simulation & Educational Technology Center
Humanism in Medicine Training

MODULE 2:
INTERVIEWING & COLLECTING INFORMATION

Dr. Natalie Fadel & Dr. Ed Magalhaes

Humanism Modules:
1. Opening Encounter
2. Interviewing and Collecting Information
3. Personal Manners/Clinical Courtesy
4. Rapport
5. Information Delivery and Counseling
6. Closure
The Virtual Standardized Patient: an Effective Modality for Educating Preclinical Medical Student Presentation Skills. A Comparative Item Analysis of Live Standardized Patients versus Virtual Patients

Fred A. Rawlins II, DO, Christopher Martin MHS, Carolyn Lucas RN, MEd, EdS, Jennifer Januchowski RN, Janella Looney BA, Dalia E. Meisha, DDS, MPH, DScD: Edward Via College of Osteopathic Medicine

- 340 Students  160 Carolinas, 180 Virginia   Campus
- 2 Arms – Typical Live SP Model (VA) & Virtual SP (CC)
- 4 Cases – Acute inferior wall MI, Pyelonephritis with Ureteral Calculi, Pneumonia with Sepsis & Hemorrhagic CVA
- 5 Minute Presentation to Physician
- Graded On History, Physical, Assessment and Plan
Emergent cases, Clear Diagnosis
- Acute Inf. MI
- Hemorrhagic CVA
- Septic Ureteral Calculi
- Pneumonia w/ Sepsis

Virginia Campus Presentation Model
- Clinical Medicine Lecture Series B1-8
- Data Sets for Biomedical Component
- Student Presentation Physician 5 Minutes
- Live SP Encounter & SOAP Note 34 minutes

Carolina Campus Presentation Model
- Clinical Medicine Lecture Series B1-8
- Data Sets for Biomedical Component
- Student Presentation Physician 5 Minutes
- Virtual SP Encounter & SOAP Note 34 minutes

180 Students 160 Students
Interactive Learning Management – Virtual Patient

Setting: ER
Time: 4:00 pm
Patient Name: Mr. Williams
Age: 63
Chief Complaint: Back pain

Vital Signs:
BP- 100/60
P- 120
RR- 18
Temp- 102.5°

ONCE YOU STOP YOUR ENCOUNTER YOU MAY NOT GO BACK TO THE MODULE!
Current Illness:
A 63-year-old man, Mr. Williams, was brought into the ER complaining of back pain that seems to be getting worse. Three hours ago, the pain woke him up from a nap on the couch and has been constant since then. The pain is located on his mid-back area on the left side and radiates to his left lower abdomen and left groin. He describes that “sometimes the pain is sharp, and sometimes there is a dull ache in my left lower abdomen” and explains that he has never felt anything like this before. He hasn’t noted any worsening of the pain. He took Tylenol a couple of hours ago, but hasn’t seen any improvement. On a scale of 1 to 10, he says that the pain started out as a 6, but currently rates his pain a 7.
I feel terrible. Can I have something for this pain?
### Physical Exam

<table>
<thead>
<tr>
<th>部位</th>
<th>Palpate</th>
<th>Examine Eyes, Ears, Nose or Mouth</th>
<th>Neurological</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NECK</td>
<td>Inspect</td>
<td>Auscultate</td>
<td>Palpate</td>
</tr>
<tr>
<td>TORSO</td>
<td>Inspect</td>
<td>Auscultate</td>
<td>Percuss</td>
</tr>
<tr>
<td>ABDOMEN</td>
<td>Inspect</td>
<td>Auscultate</td>
<td>Percuss</td>
</tr>
<tr>
<td>ARMS</td>
<td>Palpate</td>
<td>ROM</td>
<td>Inspect</td>
</tr>
<tr>
<td>LEGS</td>
<td>Palpate</td>
<td>ROM/Gait</td>
<td>Inspect</td>
</tr>
<tr>
<td>OMM</td>
<td>TART</td>
<td>Segmental Changes</td>
<td>Chapman's Points</td>
</tr>
</tbody>
</table>

*Interactive LMS Report – Physical options selected by the Class & Student*
Diagnostics

- X-Ray: KUB
- 12-Lead EKG
- X-Ray: Chest
- Lab: CBC
- Lab: Chemistry Panel
- Lab: UA
<table>
<thead>
<tr>
<th></th>
<th>Bilirubin</th>
<th>Blood</th>
<th>Ketone</th>
<th>Leukocytes</th>
<th>Nitrite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result</td>
<td>Neg</td>
<td>Pos</td>
<td>Neg</td>
<td>3+</td>
<td>Pos</td>
</tr>
<tr>
<td>Normal Value</td>
<td>Neg</td>
<td>Neg</td>
<td>Neg</td>
<td>Neg</td>
<td>Neg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Protein</th>
<th>Spec. Gravity</th>
<th>pH</th>
<th>Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result</td>
<td>Neg</td>
<td>1.02</td>
<td>6.0</td>
<td>Pos</td>
</tr>
<tr>
<td>Normal Value</td>
<td>Neg-Trace</td>
<td>1.002-1.030</td>
<td>5.0-7.0</td>
<td>Neg</td>
</tr>
</tbody>
</table>
### Answer Analysis — Standardized Patient - 2016

**Case:** 8 - B Flank Pain Presentation Case  
**Checklist:** Faculty

#### 1. Presentation History

<table>
<thead>
<tr>
<th>Answer</th>
<th>Points</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Pain - Sharp 6-7/10</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>L mid - back area on the left side</td>
<td>1</td>
<td>100%</td>
</tr>
<tr>
<td>Radiating to lower abdomen and groin (dull ache)</td>
<td>1</td>
<td>90.9%</td>
</tr>
<tr>
<td>Sudden onset 3 hour duration</td>
<td>1</td>
<td>93.9%</td>
</tr>
<tr>
<td>Fever and chills</td>
<td>1</td>
<td>81.6%</td>
</tr>
<tr>
<td>PMHx - hypertension, pout, diabetes Type II</td>
<td>1</td>
<td>95.9%</td>
</tr>
<tr>
<td>Meds - isosporil, metformin and allopurinol</td>
<td>1</td>
<td>91.8%</td>
</tr>
<tr>
<td>RHx - Mother HX of kidney stones, Father HX abdominal aneurysm died as a result</td>
<td>1</td>
<td>93.9%</td>
</tr>
<tr>
<td>Tylenol - No Help</td>
<td>1</td>
<td>89.8%</td>
</tr>
<tr>
<td>ROS: Dysuria, frequency, hematuria, nausea</td>
<td>1</td>
<td>89.8%</td>
</tr>
</tbody>
</table>

**Total:**

#### 2. Presentation Physical Exam

<table>
<thead>
<tr>
<th>Answer</th>
<th>Points</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitals Temp 102.5, HR-120, RR-18, BP 100/60</td>
<td>1</td>
<td>91.8%</td>
</tr>
<tr>
<td>General Statement - Distressed, in pain or similar</td>
<td>1</td>
<td>48.9%</td>
</tr>
<tr>
<td>Heart - Tachycardia without murmur</td>
<td>1</td>
<td>93.9%</td>
</tr>
<tr>
<td>Lungs - Clear to auscultation</td>
<td>1</td>
<td>91.8%</td>
</tr>
<tr>
<td>Abdomen - no abdominal masses/fruit, mild LLQ pain on palpation</td>
<td>1</td>
<td>91.8%</td>
</tr>
<tr>
<td>Left CVA pain with percussion</td>
<td>1</td>
<td>89.8%</td>
</tr>
<tr>
<td>Peripheral pulses palpable</td>
<td>-</td>
<td>16.3%</td>
</tr>
</tbody>
</table>

**Total:**

#### 3. Presentation - Diagnostics - As interpreted by student

<table>
<thead>
<tr>
<th>Answer</th>
<th>Points</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>KUB Large left urethral stone</td>
<td>1</td>
<td>95.5%</td>
</tr>
<tr>
<td>Urinalysis + Blood, + leukocytes, + nitrite, + micro &gt;100 WBCs</td>
<td>1</td>
<td>96.6%</td>
</tr>
<tr>
<td>CBC + WBC 21K with Leuk shift, 15% Bands</td>
<td>1</td>
<td>93.9%</td>
</tr>
<tr>
<td>Chem Panel - within Normal limits</td>
<td>1</td>
<td>85.7%</td>
</tr>
<tr>
<td>EKG Sinus Tachycardia</td>
<td>1</td>
<td>85.7%</td>
</tr>
<tr>
<td>CXR - AP Chest Narrow mediastinum, no infiltrates</td>
<td>1</td>
<td>85.7%</td>
</tr>
</tbody>
</table>

**Total:**

#### 4. Presentation - Assessment

<table>
<thead>
<tr>
<th>Answer</th>
<th>Points</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyelonephritis with Left Urethral Calculi (Infected Stone)</td>
<td>1</td>
<td>85.1%</td>
</tr>
<tr>
<td>Gout (Secondary)</td>
<td>1</td>
<td>66%</td>
</tr>
<tr>
<td>Diabetes Type II (Secondary)</td>
<td>1</td>
<td>72.3%</td>
</tr>
<tr>
<td>Hypertension (Secondary)</td>
<td>1</td>
<td>70.2%</td>
</tr>
</tbody>
</table>

**Total:**

#### 5. Presentation Plan

<table>
<thead>
<tr>
<th>Answer</th>
<th>Points</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admit</td>
<td>1</td>
<td>95.8%</td>
</tr>
<tr>
<td>IV</td>
<td>1</td>
<td>83.3%</td>
</tr>
<tr>
<td><strong>Urine culture</strong></td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>1</td>
<td>70.8%</td>
</tr>
<tr>
<td>Pain Medication</td>
<td>1</td>
<td>87.5%</td>
</tr>
<tr>
<td>Consult L&amp;D</td>
<td>1</td>
<td>88.8%</td>
</tr>
<tr>
<td>CT of abdomen &amp; Pelvis (Non-Contrast)</td>
<td>-</td>
<td>22.9%</td>
</tr>
</tbody>
</table>

**Total:**

---

Report generated – Clinical Medicine Curriculum & Individual Student Answer Analysis Report
Communication Curriculum and Individual Student Improvement

• Curriculum Improvement

• Simulation Server System reports P-Values and Pt. Biserial for all presentation for the 4 categories and 31 elements

• Please Note Low P-Values in the Septic Ureteral Calculi case:
  ◦ 16% - Peripheral Pulses
  ◦ 19% - Urine Culture
  ◦ 23% - Non-con CT ABD/Pelvis

• Provides platform for Medical Presentation

• Interactive SP LMS - individual reports

• Experience multiple systems that allows for a focused history, physical, and assessment with individualized student feedback

• For example: Significance of Peripheral Pulses, Urine Culture, and Non-con CT in older patient (new onset)

• Reflective self-assessment through digital archive video review
Results and Discussion

In this study, performance on the virtual case presentations and live patients were found to be comparable (percentage of correct answers was 77.3% and 76.8% respectively, $p = 0.9$). Item analysis on students’ scores in the 4 areas of the case presentation showed no statistically significant difference in students’ performance between virtual and live patients (see Table 1). Further analysis for each of the 4 cases still showed no statistically significant difference on students’ performance between virtual and standardized patients.

Table 1. Comparison between virtual and standardized patients in the students’ performance in case presentation

<table>
<thead>
<tr>
<th></th>
<th>Virtual Patient</th>
<th>Standardized Patient</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>History</td>
<td>94.4% ± 6.9</td>
<td>89.7 ± 14.6</td>
<td>0.06</td>
</tr>
<tr>
<td>Physical Assessment</td>
<td>78.0 ± 17.4</td>
<td>78.3 ± 20.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Differential</td>
<td>69.8 ± 19.8</td>
<td>64.8 ± 19.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Plan</td>
<td>58.7 ± 28.1</td>
<td>62.2 ± 30.1</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Closure

Effective model for managing 1100 pre-clinical medical students that provides the basis for continuous curriculum improvement and individual learner education.

Thanks for Listening!
Questions

Fred Rawlins II DO FACOEP
frawlins@vcom.vt.edu