Today’s Host

• Susan E. Skochelak, MD, MPH, Group vice president, Medical Education, American Medical Association

• Dr. Skochelak developed and leads the AMA’s Accelerating Change in Medical Education initiative

• She previously served as the Senior Associate Dean for Academic Affairs at the University of Wisconsin School of Medicine and Public Health
Presenter

- Maya Hammoud, MD, Director, Medical Education Innovation, American Medical Association
Presenter

• Suzanne Rose, MD, MSEd, Senior Associate Dean for Education, UConn School of Medicine
Presenter

• Kathy Frank, RN, PhD, AGSF, IU Geriatrics Program Administrator, Indiana University School of Medicine
Objectives

• Review the importance of integrating EHR learning platform into medical student education

• Review the use of the virtual EHR at two schools: U Conn School of Medicine and Indiana University School of Medicine

• Discuss the challenges and opportunities to integrating EHR learning platform into medical student education

Note: The Regenstrief EHR Clinical Learning Platform is an educational program, and the views expressed do not constitute an endorsement of any specific technology.
Question

• What is your primary responsibility in education?
  • UME
  • GME
  • CME
  • Allied Health Professions
  • Not for profit organization or society
  • For profit organization or company
  • Other
Medical Students and the EHR

- EHRs are used in more than 90% of practices

- Medical students are often restricted from utilizing the EHR and they can enter residencies without adequate preparation to use them effectively

- Students’ EHR skills do not improve as they progress through their clinical year\(^1\)

- Students want more training and the ability to document in EHRs\(^2\)

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\(^1\)Biagioli FE, Elliot DL, Palmer RT, Graichen CC, Rdesinski RE, Ashok Kumar K, Galper AB, Tysinger JW. The Electronic Health Record Objective Structured Clinical Examination: Assessing Student Competency in Patient Interactions While Using the Electronic Health Record. Acad Med. 2017 Jan;92(1):87-91

Question

• What are your students allowed to do in the EHR?
  • View notes
  • Write notes
  • Enter orders
  • Receive feedback
EHR as a Clinical Learning Platform

• Training students on the EHR is not simply introducing them to the technology

• Effectively utilizing the EHR is a skill that students must learn and practice throughout medical school

• Presenting patients through an EHR platform can begin in the preclinical years
EHR as a Clinical Learning Platform

• The virtual EHR was developed by the Regenstrief Institute to ensure medical students and medical trainees gain real-world experience using EHRs during their training

• It includes over 11,000 real, de-identified patient records

• It enables learners to access patient data, enter individual/unique actions, see actions entered across practice settings, receive alerts, and pull logs and reports

• Enables learner assessment of knowledge application in patient & population care, critical thinking skills, clinical decision-making skills, and UME EPAs
Current Users

- Indiana University School of Medicine
- Eskenazi Health
- IU Health
- University of Connecticut School of Medicine
- Sidney Kimmel Medical College, Thomas Jefferson University
- University of Southern Indiana
- University of Idaho WWAMI Medical Education Program
- Heritage College of Osteopathic Medicine, Ohio University
Logon screen

- Logo, name appropriate for each institution
- Can use an institution’s network credentials
- Or locally created credentials
Provider (instructor) landing page

- Patient list
- Number, content of lists are customizable

- Plug ins, can be customized to user role, level of training, in this case an instructor

- Announcements

- To do list
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Clinical setting

Setting workflow

Patient Landing page

Online tutorials

Mis-identified patient identifiers

Patient Landing page

Medication list

Problem list

Allergy list

Infopanel

Multiple use information panel

In this case, all recent results
Interprofessional Education Tool

Multiple user alert

Infopanel as a communication area
# Teaching Virtual EHR Applications

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**AMA Innovations in Medical Education Webinar Series**

Your MISSION is Our MISSION
Using the Regenstrief EHR Clinical Learning Platform in the MDelta Curriculum

Suzanne Rose, MD, MSEd
Senior Associate Dean for Education
Professor of Medicine
UConn School of Medicine
• Explosion of scientific information
• Change in health care systems
• A better understanding of adult learning theory
  • Active
  • Relevant
UME Curricular Reform: Concepts Considered

- Technology in Education and in Medicine
- Partnership with the School of Dental Medicine and IPE
- Individualization and self-directed learning
- Shortened year one/two curriculum
- Integration of basic sciences with clinical medicine
- Simulation
- Patient-centered case based learning
- Team-based learning - Elimination of lectures
- Early clinical exposure
- Integration of public health, policy, and emerging trends
- Career exploration opportunities
- Discovery and scholarship
Stages of the Curriculum:

**Exploration Stage 1**
- CoRE: Case Oriented Essentials
- Fabric of Anatomy & Biology Lab
- DoCC: Delivery of Clinical Care
- Clinical Home

**Clinical Immersion Stage 2**
- Clinical Rotations

**Transformation Stage 3**
- Transition to Residency
- Advanced Clinical Rotations

**CLIC:** Clinical Longitudinal Immersion in the Community

**ILOs:** Individualized Learning Opportunities
- Electives
- VITALS/IPE
- Vertically Integrated Teams Aligned in Learning & Scholarship/Interprofessional Education
- Discovery & Scholarship
AMA: Change Med Ed

New schools joining the Accelerating Change in Medical Education Consortium

Twenty-one medical schools are joining the 11 founding members of the Accelerating Change in Medical Education Consortium to transform medical education. The new members were selected from more than 100 medical schools that applied.

Principal investigator: Suzanne Rose, MD, MSEd, senior associate dean, education
Role of the virtual EHR in MDelta

- Brings together:
  - Technology
  - Case-based presentations
  - Our interests in public health

- Promotes progressive levels of student engagement

- Two main uses:
  - COrE course: presentation of Cases for TBL
  - VITALS Course: Public Health
    - social determinants of health disparities
Virtual EHR
Collaboration with Indiana University & Regenstrief

Case Oriented Essentials: COrE

• Cases (based on 3 families) embedded in the EHR
• Mined the thousands of cases in the EHR to match family members with mis-identified patient in the database
• Cases introduce each unit in COrE and may be used in TBL application exercises
• Revisit family members over the continuum
Virtual Families & Virtual Patients

Opportunities

• Add clinical context
• Help associate material with something that is relevant
• Make it more interesting
• Allow for prominence of psychosocial issues exploration as well as a view of disparities

Challenges

• Very difficult to be comprehensive
• Time consuming for faculty to make sure that there is consistency and memory
The student will be able to utilize the EHR to:

- identify clinical history
- access past visits
- review laboratory and imaging results
COre CASES

- A1 Patient who wishes to lose weight
- A2 Patient with iron deficiency anemia
- A3 Patient with chronic myelogenous leukemia
- A4 Well baby check with vaccination
- A5 Adolescent with upper respiratory symptoms
- A6 Patient with ITP
- A7 Patient with shoulder pain: rotator cuff injury
- A8 Patient with carpal tunnel injury
- A9 Patient with back pain
- A10 Patient with knee injury
- B1 Young adult with motor vehicle collision (DUI)
- B2 Infant with Down syndrome and congenital heart disease
- B3 Adult with chest pain (acute MI)
- B4 Child with asthma
- B5 Adult with hyponatremia
- B6 Adult with hypertension (RAS)
- B7 Adult with congestive heart failure
- B8 Adult with upper abdominal pain
- B9 Patient with diarrhea
- B10 Patient with colon carcinoma
- C1 Couple with infertility
- C2 Pregnant patient with complication
- C3 Transgender man with breast cancer
- C4 Young adult with odontogenic infection
- C5 Patient with oral ulcers
- C6 Patient with head and neck carcinoma
- C7 Patient with meningitis
- C8 Patient with stroke
- C9 Patient with fatigue due to neuromuscular disorder
- C10 Patient with dementia

- D1 Patient with diabetes
- D2 Patient with goiter with complication of parathyroid resection
- D3 Patient with spinal compression fracture
- D4 Patient with hepatitis C
- D5 Patient with COPD complicated by pulmonary carcinoma
- D6 Patient with hematuria
- D7 Patient with SLE
- D8 Patient with HIV
- D9 Patient with melanoma
- D10 Young adult with psychotic break complicated by Hodgkin lymphoma
- E1 Hunter with 3rd degree AV block from Lyme
- E2 Young man with hemochromatosis
- E3 Elderly immigrant with CLL and ocular disorder
- E4 Elderly AA man with diverticular abscess found to have AAA on imaging, surgery complicated by sepsis/SIRS/ARDS with history of CAD, hypertension and DM
- E5 45 yo Latina with PCOS/metabolic syndrome/OSA/restrictive pulmonary disease complicated by endometrial carcinoma
- E6 Female prisoner with bipolar disease, substance abuse, sexual abuse, domestic violence, STD, cervical carcinoma
- E7 Toddler with atopy, eczema,
- E8 Elderly patient with multiple myeloma complicated by amyloidosis
- E9 Patient with pulmonary embolus secondary to pancreatic carcinoma
- E10 Elderly patient with polypharmacy
Latino Family

1. Carlos Rivera – 44 yo Puerto Rican Truck driver. HS grad. Obese.
2. Maria Rivera – 40 yo clerk at Stop and Shop. HS grad.
4. Isabella Rivera – 16 yo high school sophomore engaging in unprotected sex with her 20 yo boyfriend.
5. Juanita Rivera – 62 yo early onset dementia. She lives with Carols (Carlos) and Maria.
6. Ana Vasquez – 41 yo sister of Maria. HS graduate. Beautician

Credit for the Families: Dr. David Henderson
Associate Dean for Student Affairs, Multicultural & Community Affairs
REPORT:

MARIA RIVERA (153053067)

ENCOUNTER DATE:

08/10/2016

Dr ID:

PAULINE AKERS (3076063299)

Staff Doctor:

PAULINE AKERS (3076063299)

Encounter Site:

High Street Medical Group

Primary Care Dx:

Medical examinations/reports status (finding) (primary diagnosis)
ISC: V70.0
History of - diabetes mellitus (context-dependent category)
ISC: V12.21
Overweight (finding)
ISC: 278.02
IUD
ISC: V45.51
Tinea corporis (disorder)
ISC: 110.5

GENERAL NOTE:

CC: here for annual check up alc and annual exam, wants IUD strings checked

HPI: 46yo Hispanic female. She had an copper T IUD placed 09/18/2013. She would like strings checked. No abd pain. Her menstruation is not regular she is now skipping some months. LMP is today. She thinks she could improve her diet and increase her exercise. She is not currently exercising but plans to walk. She is printing some suggested activities such as aqua fitness and also...
IUD
ICD: V45.51
Tinea corporis (disorder)
ICD: 110.5

GENERAL NOTE:

CC: here for annual check up and annual exam, wants IUD strings checked

HPI: 44yo Hispanic female. She had an copper T IUD placed 09/18/2015. She would like strings checked. No abd pain. Her menstruation is not regular she is now skipping some months. IMP is today. She thinks she could improve her diet and increase her exercise. She is not currently exercising but plans to walk. She is drinking some sweetened drinks such as agua fresca and also some water she is eating a lot of tortillas

ROS
no fever no chills appetite nil her weight is going up
no chest pain no dyspnea
cor no chest pain no palpitation no orthopnea
skin ooz fungal areas on skin dry in winter

AMA Innovations in Medical Education Webinar Series
Summary of EHR Use in COrE

- Present course material in the context of standardized virtual patients in three separate families that represent the diversity of the local population (with the exception of our Burmese family members)
- Teach clinical decision-making by providing a realistic context for students
- Explore past patient data inclusive of biomedical as well as psychosocial information to develop a holistic approach to clinical care
- Teach clinical documentation skills
  - Assessments and Plans (diagnosis and treatment decisions)
- Track student activity individually and in teams (during TBL sessions) to collect data to gain insight into the student learning process
- Provide more robust assessment of learners
- Evaluate the curriculum and the TBL pedagogy
The students will be able to:

• Query the EHR to assess the health conditions and demographics of their “patient panel.”
• Identify
  • “How many other patients in the panel have this condition?”
  • “How are they the same or different by age, race, ethnicity, or zip code from my virtual patient?”
• Measure whether documented care of individual or groups of patients meets evidence-based guidelines
• Practice systematically planning future care of their virtual patients to promote better population health.
Question

Regarding the use of the virtual EHR in UME:

A. Has potential benefits to UME
B. Too many barriers to justify the benefits of implementation
C. Too advanced for UME level students
D. Intriguing – need more information
• Students become very involved with the virtual patients
• They advocate for the patients passionately
• The virtual EHR promotes adult learning: active, feedback, relevant, problem-centered
• Prepares students for their future clinical roles
Next Steps

- Fully implement the virtual EHR in these two courses
- Consider other uses for the virtual EHR in UME: Clinical Skills, Doctoring course, Clerkships
- Consider other uses of the virtual EHR across the continuum of medical education
Thanks to the UME Leadership Team … AT:

- Suzanne Rose, MD, MSEd, Senior Associate Dean for Education
- David Henderson, MD, Associate Dean for Student, Multicultural and Community Affairs
- Thomas Manger, MD, PhD, Director of Stage One and COrE
- Zita Lazzarini, JD, MPH, Director of Social and Behavioral Sciences
- Christine Thatcher, EdD, Associate Dean for Medical Education & Teaching Enhancement
- Ellen Nestler, MD, Assistant Dean for Medical Student Clinical Education
- John Harrison, PhD, Basic Science Principal and Director of the Human & Virtual Anatomy Labs
- Paige Dunion, MSEd, Administrative Manager, Academic Educational Affairs
- TV Rajan, MD, PhD, Co-Chair of Curriculum Reform
- Ula Knapik, Officer, Academic Educational Affairs Officer
Using the Regenstrief EHR Clinical Learning Platform in Geriatrics Workforce Enhancement Program

Kathy Frank, RN, PhD, AGSF
IU Geriatrics Program Administrator
Indiana University School of Medicine
Virtual EHR at Indiana University School of Medicine

2015-2016
- Quality Health Delivery course - M2’s, used as an introduction to EHR’s, geo-mapping (zip codes) health disparities, using EHR data to create differential diagnoses

2016-2017
- Introduction to Clinical Medicine – M1’s, introduction to EHR’s
- Global Longitudinal Intersession Curriculum – M3’s, Health systems science, IPE
- GWEP – elder patient vulnerabilities, IPE

2017-2018
- Foundations of Clinical Medicine 2 – M2’s, Case presentations
- Phase 3 – M4’s, an adjunct to clinical electives, subinternships
Use of the Virtual EHR in the Geriatrics Workforce Enhancement Program

Objective

Determine if the Virtual EHR tool could be used to deliver and evaluate the learners’ ability to create a comprehensive care plan for geriatric patients established collectively by inter-professional learners.
Geriatrics Workforce Enhancement Program (GWEP)

Purpose

“The Geriatrics Workforce Enhancement Program (GWEP) supports the development of a health care workforce that improves health outcomes for older adults by integrating geriatrics with primary care, maximizing patient and family engagement, and transforming the healthcare system”
Indiana IGETC Partners

- IU School of Medicine
  - Medical Students
  - Internal Medicine Residents
  - Med Peds Residents
  - Family Medicine Residents
- IU School of Nursing-Advanced Practice Nurse students
- IU School of Social Work-Master of Social Work students

- IU Inter-professional Practice and Education Center
- Eskenazi Health
- IU Health
- Richard L. Roudebush VA Medical Center
- CICOA Aging & In-Home Solutions
- Alzheimer’s Association
Each month the GWEP Fellows (5 ANP students and 5 MSW students) with the residents on the Geriatric Medicine rotation are sent an email with a geriatric case to review and prepare to discuss during the Face-to-Face session.
Geriatric Case Summary

Case Discussion (331871521)
April 5, 2017

Mr. Beasley is a 79yo African American male who has type 2 diabetes mellitus, glaucoma, history of cigarette smoking, chronic systolic heart failure, chronic obstructive lung disease, hypertensive chronic kidney disease stage 3, acute retention of urine with acute cystitis without hematuria, CAD with s/p angioplasty with stents, and implanted cardiac defibrillator.

Medications include: Breo 100mcg/25mcg, one puff daily, albuterol HFA 90 mcg/inh MDI prn, Tiotropium 18 mcg/nh daily capsule, aspirin 81mg, atorvastatin 80mg daily, cholecalciferol 2000 units, ferrous sulfate 325mg, furosemide 40mg, Metoprolol succinate 25mg daily, Pantoprazole 40 mg EC daily, hydrocodone bitartrate 5mg/acetaminophen 325mg prn, polyethylene glycol 3350 one tablespoon daily, prasugrel 10mg daily, Nicotine 21mg/day patch, travoprost 0.004% Ophth soln one drop in both eyes, and normal saline for catheter irrigation.

He was in the hospital 6/15-6/18 with worsening dyspnea and fatigue. He was discharged back home, where he lives with his grandson. He is followed by the GRACE (Geriatrics Resources for Assessment and Care of Elders) and has regular home visits.
Patient File in the EHR
Interprofessional Geriatrics Clinical Care Conferences with Medical Residents, APN Students, and MSW Students

- Each geriatric case has a template with a list of questions and notation of which note in the patient file to review

- Each student is responsible to complete a note with the template with their answers to help prepare them for the Face-to-Face session
Case Questions template with guide of which note to review
Interprofessional Geriatrics Clinical Care Conferences with Medical Residents, APN Students, and MSW Students

- End of each Face-to-Face session the students complete an evaluation
- Ratings from students about IPE group session using teaching Virtual EHR have reported:
  - Very Useful (55%) or Useful (45%)
Development of a IPE activity in the teaching Virtual EHR: “Team Card template”

- Created a second template called the shared “team card”
- Each trainee submits their answers in the same note and places their initials at the end.
- All the trainees can see the answers from the other trainees
- Discuss questions and answers during the Fact-to-Face session
EHR: “Team Card template”
Goals of the Team Card

- The trainees learn by reviewing the answers about the different disciplines roles/responsibilities
- The trainees as a team would develop the plan of care for the older adult
- The trainees have access to communicate with the other disciplines via a chat box in the virtual EHR
EHR: Chat box
Instructor Toolkit

- Review each trainee’s completed answers for the individual case template
- Review the trainee’s answers in the Team Card
- Review comments in the chat box
- Know which students completed their work prior to the Face-to-Face session
EHR: Instructor Toolkit
Evaluation Comments from Students

- Great opportunity to review case and learn what providers documented and ordered
- Great opportunity to work with other disciplines and get a more rounded perspective
- The interdisciplinary conversation was awesome & really helped to show how different services can come together to overcome the patient issues
- Learning about the other disciplines points of view
- Having clinicians from each discipline present that are already working with geriatric patients
Next Steps: Quality Improvement

- Next round of GWEP Fellows starts next August
- Plan to review feedback and determine next steps to improve the process
  - Revised the end of year evaluation tool to obtain more feedback about the virtual EHR from 1st GWEP Fellows
  - Review orientation handouts about the virtual EHR
  - Review email communications to students about virtual EHR activities
  - Revise the monthly evaluation forms with more specific questions about virtual EHR
Special Thanks to our team!

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Jeff Warvel</td>
<td>Business Analyst</td>
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<tr>
<td>Michael Brehm</td>
<td>Lead Engineer</td>
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<tr>
<td>Josh Jones</td>
<td>Engineer</td>
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<td>Haritha Mannam</td>
<td>Engineer</td>
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<tr>
<td>Kruti Patel</td>
<td>Engineer</td>
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<tr>
<td>Brian Stout</td>
<td>Sr Product Owner</td>
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<tr>
<td>Layla, Baker</td>
<td>Content / Curriculum</td>
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<tr>
<td>Rachel Gruber</td>
<td>Project Manager</td>
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<td>Lisa Gill</td>
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<tr>
<td>Debra Litzelman</td>
<td>Faculty</td>
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<td>Blaine Takesue</td>
<td>Faculty</td>
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AMA Innovations in Medical Education Webinar Series: Implementing a Teaching Virtual EHR as a Clinical Learning Platform

Questions

Your MISSION is Our MISSION
Future Events

Please join us to ask questions of our panelists at:

ace.communities.ama-assn.org

- Implementation of the virtual EHR
- Use in curriculum
- Implications for the future of medical education

### Future webinars

June 5 at 12 p.m. Central

**Transforming Education: Leading Innovations in Health Professions Education**

*In association with Educause ELI*

August 21 at 3 p.m. Central

**Using Big Data to Learn about Population Health**

### ChangeMedEd 2017

Mark your calendars:

September 14-16 in Chicago