Do they help or hinder teaching of longitudinal learners in the outpatient setting?

Joseph Jackson, MD FAAP
Bruce Peyser, MD FACP
Duke University Medical Center
CLIC International Conference, Montana
September 30, 2013

Picture: www.kidshealth.org

Disclosures

- No financial disclosures

DukeMedicine

The EMR & Medical Education

Case:

- 24 year old MSIII w/ an iPhone, ipad, and no pen who presents with a 10 year history of extreme electronic prowess and technologic independence

Case:

- 64 year old faculty pediatrician w/ a flip phone, no texting capabilities, and computer phobia, who presents with a 2 year history of technology fatigue and declining passion for medical student education

DukeMedicine

The EMR & Medical Education

FACT Medical education is undergoing monumental transformation as a result of technology

FACT The Electronic Medical Record improves healthcare delivery and coordination of care

FACT The Electronic Medical Record creates unique challenges in medical student education

FACT There is no unified consensus on how to adequately incorporate learners into a technologically dependent profession

DukeMedicine

EMR + Medical Students = Angst?

PAST

– No barriers to student access of records

PRESENT

– increasingly impenetrable barriers

FUTURE

– It remains to be seen…

DukeMedicine

Objectives

1) Articulate the importance of electronic health records in medical student education
2) Review the benefits of integrating medical students into the outpatient electronic health record
3) Discuss the challenges of integrating medical students into the outpatient electronic health record
4) Highlight current efforts at Duke University to incorporate medical students into the electronic Health record

DukeMedicine

Articulate the importance of electronic health records in medical student education

OBJECTIVE #1:

The EMR & Medical Education

- *"Curriculum must prepare medical students for entry into graduate medical education and include specific instruction in communication skills… including communication with patient and their families, colleagues, and other health professionals"*
  - Liaison Committee on Medical Education

Hammoud et al. Medical Student Documentation in EHR. Teaching and Learning in Medicine, 2012.

DukeMedicine

The EMR & Medical Education

- *"Each medical school must ensure that before graduation a student will have demonstrated the ability to communicate effectively, both orally and in writing, with patients, patients' families, colleagues, and others with whom physicians must exchange information in carrying out their responsibilities"*
  - Association of American Medical Colleges

Friedman et al. Taking note of the perceived value of MS chart documentation on Education. Academic Medicine, 2010

DukeMedicine

The EMR & Medical Education

Medical Student Documentation in Electronic Health Records: A Collaborative Statement From the Alliance for Clinical Education

TABLE 3
EHR skills expected of a medical school graduate

- Mastery of key elements of traditional patient encounter documentation (H&P, SOAP note), including familiarity with use of templates and checklists
- Comprehensive understanding of key/critical elements of order entry, including familiarity with use of order sets and pharmacy/prescription entries
- Familiarity with medication reconciliation and how/when it must be done
- Familiarity with how to access basic laboratory and radiologic data
- Familiarity with how to locate and interpret ancillary staff entries including vital signs, inputs/outputs, and nursing/allied health documentation
- Ability to locate and review historical data from prior hospitalizations or ambulatory visits including progress notes, admission H&P, consultation reports, procedure notes, and discharge summaries
- Familiarity with how to identify patient demographics including contact information

DukeMedicine

ACE Statement on Electronic Health Records

- Summary Statements are applicable to Longitudinal Integrated Clerkships
  - Every student should document in patient's chart & notes should be reviewed
  - Every student should have opportunity to practice order entry
  - Students should have exposure to clinical decision aids
  - Programs should develop competencies for student involvement and establish evaluation tools to track progress

DukeMedicine

The EMR & Medical Education

- ~64% of programs in the US allow students to use the EMR
- Few schools have written policies for student documentation in the EMR
- The opportunities for LIC students to benefit from EMR integration are greater given their enhanced continuity experiences

Hammoud et al. National Survey of Clerkship Directors. Opportunities & Challenges in Integrating EHR into UME, 2012

DukeMedicine

Review the benefits of integrating medical students into the outpatient electronic health record

OBJECTIVE #2

Benefits of Student Integration in EMR

Medical Education in the Electronic Medical Record (EMR) Era: Benefits, Challenges, and Future Directions

Michael J. Tierney, MD, Natalie M. Pageler, MD, Madelyn Kahana, MD, Julie L. Pantaleoni, MD, and Christopher A. Longhurst, MD, MS

DukeMedicine

Benefits of Student Integration in EMR

Core competency	Benefits	Challenges	Future directions
Medical Knowledge	Point-of-care clinical decision support (CDS) allows for context-relevant education[7]	Volume of online information may be overwhelming or underused[15]	Assess impact of CDS on fund of knowledge and identify most useful elements of CDS for learners
Practice-Based Learning and Improvement	• CDS provides opportunities to teach students and residents best practices[7] • EMRs offer opportunities in research and quality improvement education[6]	• CDS may be inappropriate to workflow, and/or promote alert fatigue[15] • Functional tools for registry tracking are still nascent[44]	• Well-planned implementation of CDS may improve teaching opportunities • Further development of patient-tracking tools will allow greater use in quality improvement
Patient Care	EMRs can reduce time spent in data gathering[6,19] and allow for efficient profiling and tracking of trainee clinical experiences and milestones[6]	EMRs may also introduce workflow inefficiencies[17,19,22] and may dull or stunt critical thinking skills[27,28]	Evaluate optimal computerized provider order entry implementation to maximize workflow efficiencies, and preserve critical clinical thinking
Interpersonal and Communication Skills	Learners may spend less time gathering and more time synthesizing clinical data[6,19]	Restrictions imposed on use of order entry or charting may limit EMR skill acquisition and documentation proficiency[31]	Modify documentation systems to promote EMR usage by trainees. Evaluate use of EMR as a tool for mobile, real-time clinical presentations.
Professionalism	Dedicated computer skill teaching can improve patient–provider interaction[43]	Computer–provider interaction may displace or degrade provider–patient interaction[19,40]	Determine how and when EMR-specific patient encounter skills should be introduced and assessed
Systems-Based Practice	EMRs offer potential for teaching effective integration of a network of care providers[44,47]	EMR systems have not reached maturity to support full multidisciplinary collaboration[44]	EMR technology needs to advance to fulfill needs of learners to operate effectively in the realm of the patient-centered medical home

Medical Education in the Electronic Medical Record (EMR) Era: Benefits, Challenges, and Future Directions

Michael J. Tierney, MD, Natalie M. Pageler, MD, Madelyn Kahana, MD, Julie L. Pantaleoni, MD, and Christopher A. Longhurst, MD, MS

Benefits of Student Integration in EMR

- Most frequently sited benefits include:
  - Increased legibility
  - More complete access to patient data
  - Improved remote access
  - Ability to have templates that allow for standardized care
  - Point of care teaching

Hammoud et al. Opportunities and Challenges in Integrating EHR. Teaching and Learning, 2012

DukeMedicine

Discuss the challenges of integrating medical students into the outpatient electronic health record

OBJECTIVE #3

Challenges of Student EMR Integration

- Frequently sited Challenges
  - Concerns related to use of templates
  - Concerns related to teaching time
  - Concerns related to student privilege

Hammoud et al. Opportunities and Challenges in Integrating EHR. Teaching and Learning 2012

DukeMedicine

Challenges of Student EMR Integration

Core competency	Benefits	Challenges	Future directions
Medical Knowledge	Point-of-care clinical decision support (CDS) allows for context-relevant education[7]	Volume of online information may be overwhelming or underused[15]	Assess impact of CDS on fund of knowledge and identify most useful elements of CDS for learners
Practice-Based Learning and Improvement	• CDS provides opportunities to teach students and residents best practices[7] • EMRs offer opportunities in research and quality improvement education[6]	• CDS may be inappropriate to workflow, and/or promote alert fatigue[15] • Functional tools for registry tracking are still nascent[44]	• Well-planned implementation of CDS may improve teaching opportunities • Further development of patient-tracking tools will allow greater use in quality improvement
Patient Care	EMRs can reduce time spent in data gathering[6,19] and allow for efficient profiling and tracking of trainee clinical experiences and milestones[6]	EMRs may also introduce workflow inefficiencies[17,19,22] and may dull or stunt critical thinking skills[27,28]	Evaluate optimal computerized provider order entry implementation to maximize workflow efficiencies, and preserve critical clinical thinking
Interpersonal and Communication Skills	Learners may spend less time gathering and more time synthesizing clinical data[6,19]	Restrictions imposed on use of order entry or charting may limit EMR skill acquisition and documentation proficiency[31]	Modify documentation systems to promote EMR usage by trainees. Evaluate use of EMR as a tool for mobile, real-time clinical presentations.
Professionalism	Dedicated computer skill teaching can improve patient–provider interaction[43]	Computer–provider interaction may displace or degrade provider–patient interaction[19,40]	Determine how and when EMR-specific patient encounter skills should be introduced and assessed
Systems-Based Practice	EMRs offer potential for teaching effective integration of a network of care providers[44,47]	EMR systems have not reached maturity to support full multidisciplinary collaboration[44]	EMR technology needs to advance to fulfill needs of learners to operate effectively in the realm of the patient-centered medical home

Medical Education in the Electronic Medical Record (EMR) Era: Benefits, Challenges, and Future Directions

Michael J. Tierney, MD, Natalie M. Pageler, MD, Madelyn Kahana, MD, Julie L. Pantaleoni, MD, and Christopher A. Longhurst, MD, MS

Highlight current efforts at Duke University to incorporate medical students into the Electronic Health Record

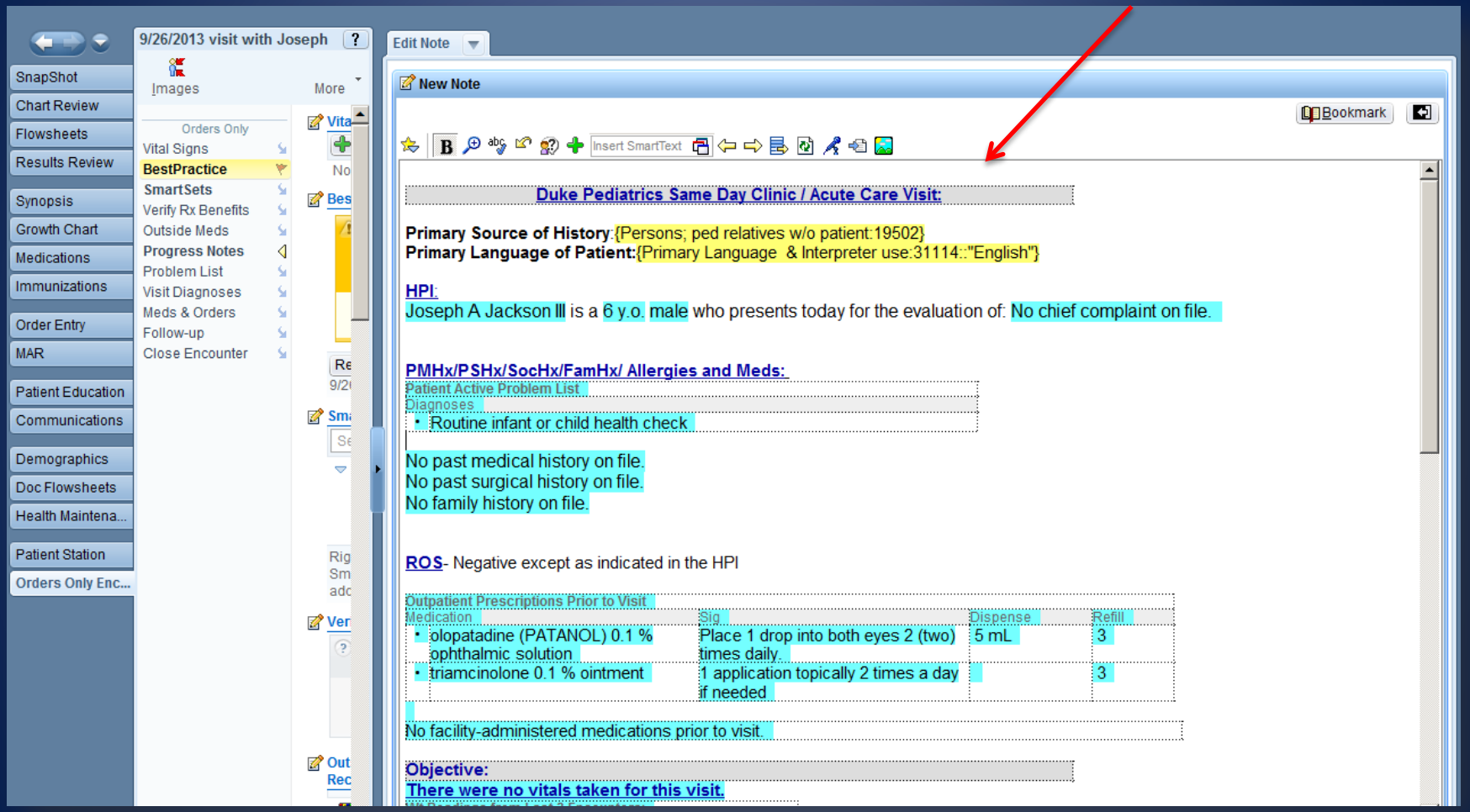
OBJECTIVE #4

Medical Student EMR use at Duke

- Examples from Duke's Longitudinal Integrated Clerkship in Pediatrics
  - Use of Templates (To Use or Not to Use)
  - Use of Clinical Decision Making Supports
  - Use of Developmental Prompts
  - Use of Patient Instruction Functionality
  - Use of Disease specific Order Sets

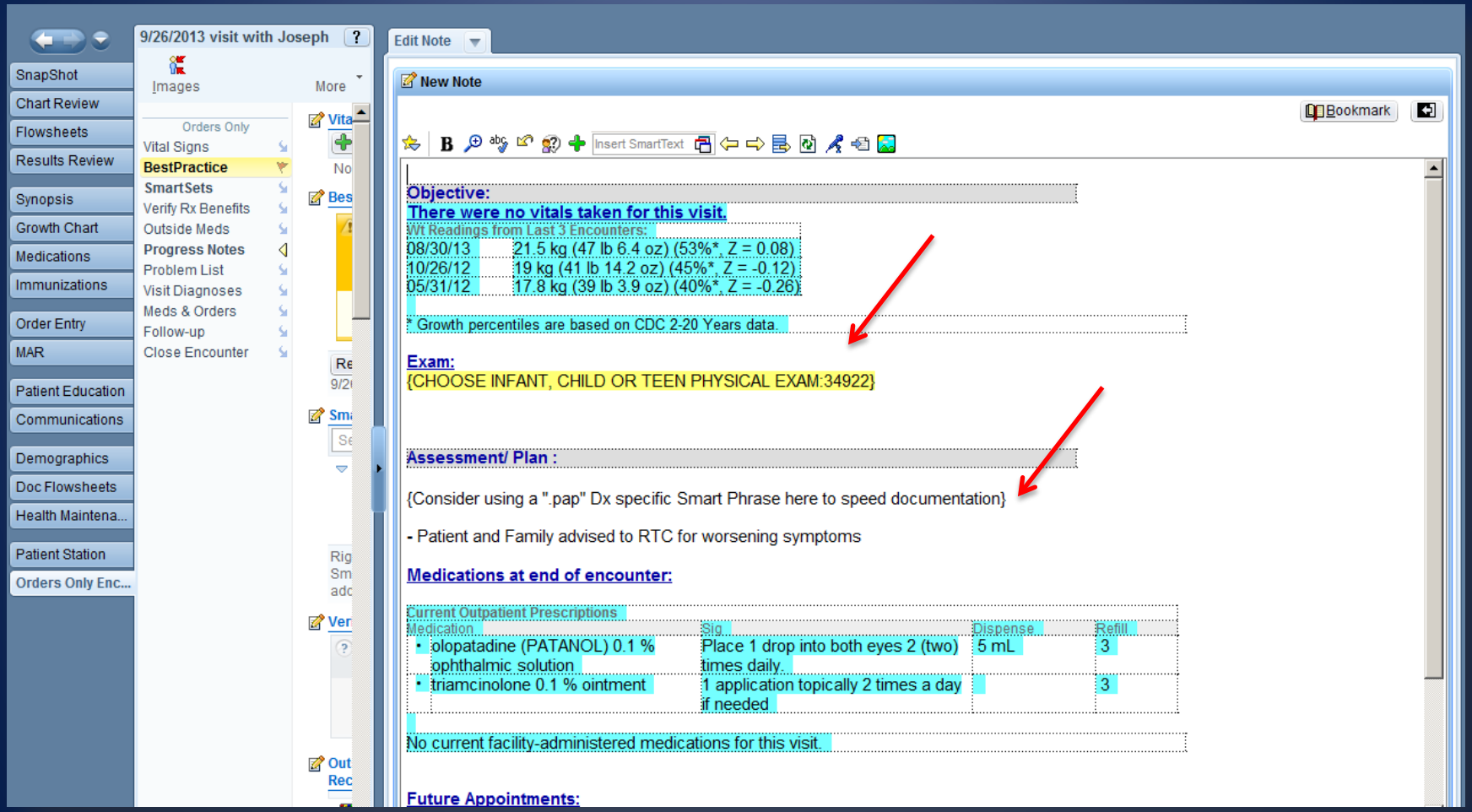
DukeMedicine

Incorporating Templates in LIC



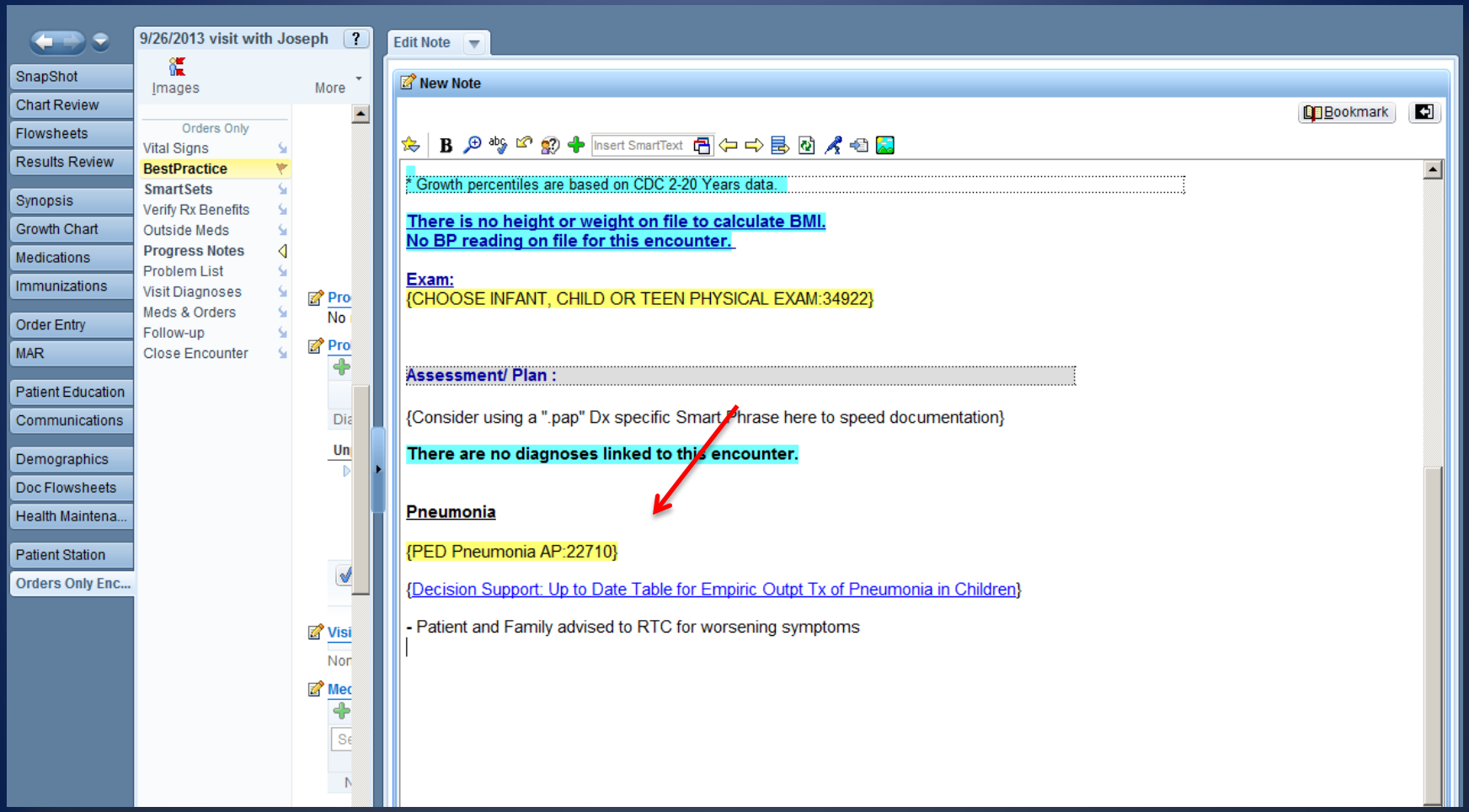
DukeMedicine

Student Template vs. Faculty Template



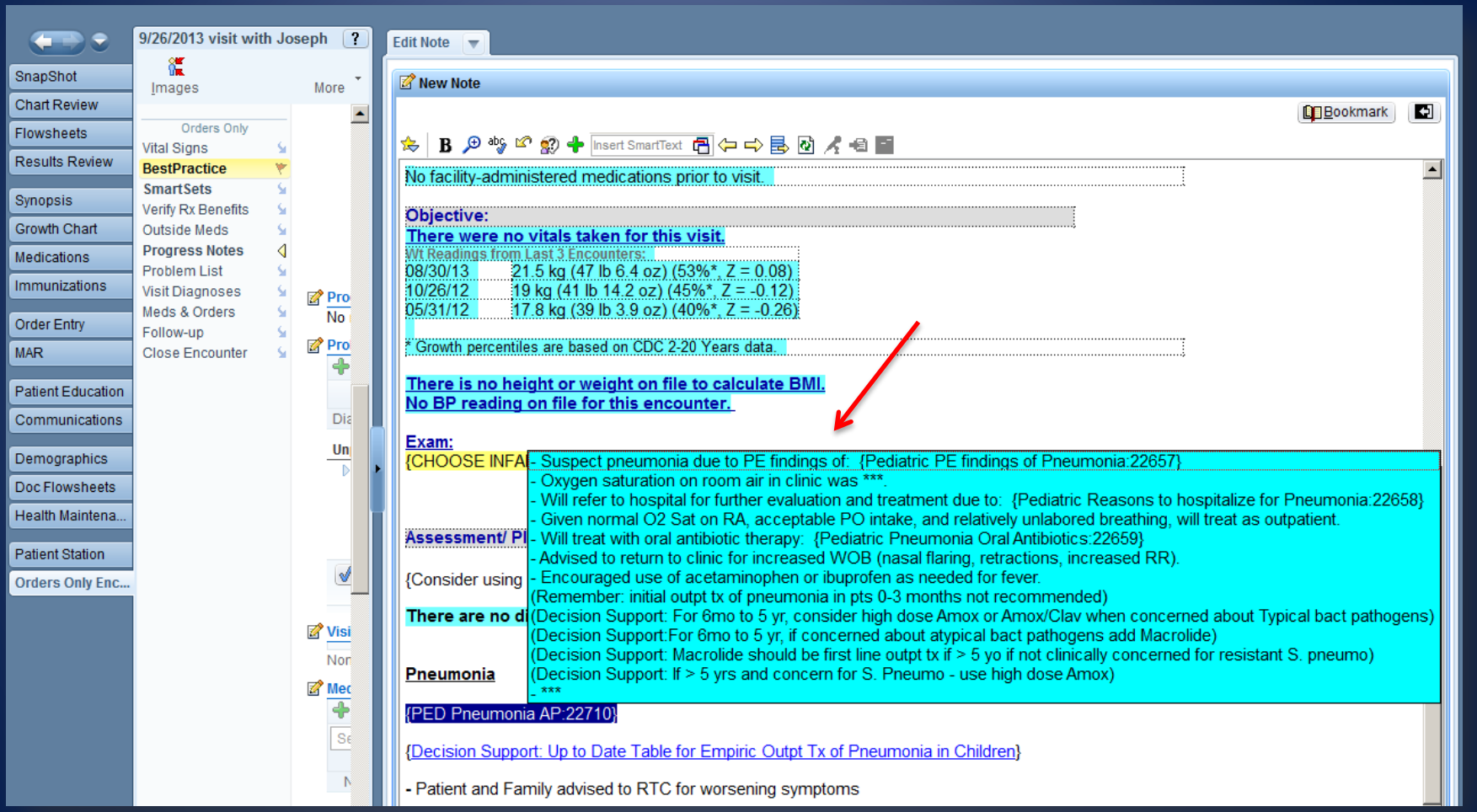
DukeMedicine

Incorporating Clinical Decision Supports



DukeMedicine

Clinical Decision Tools



DukeMedicine

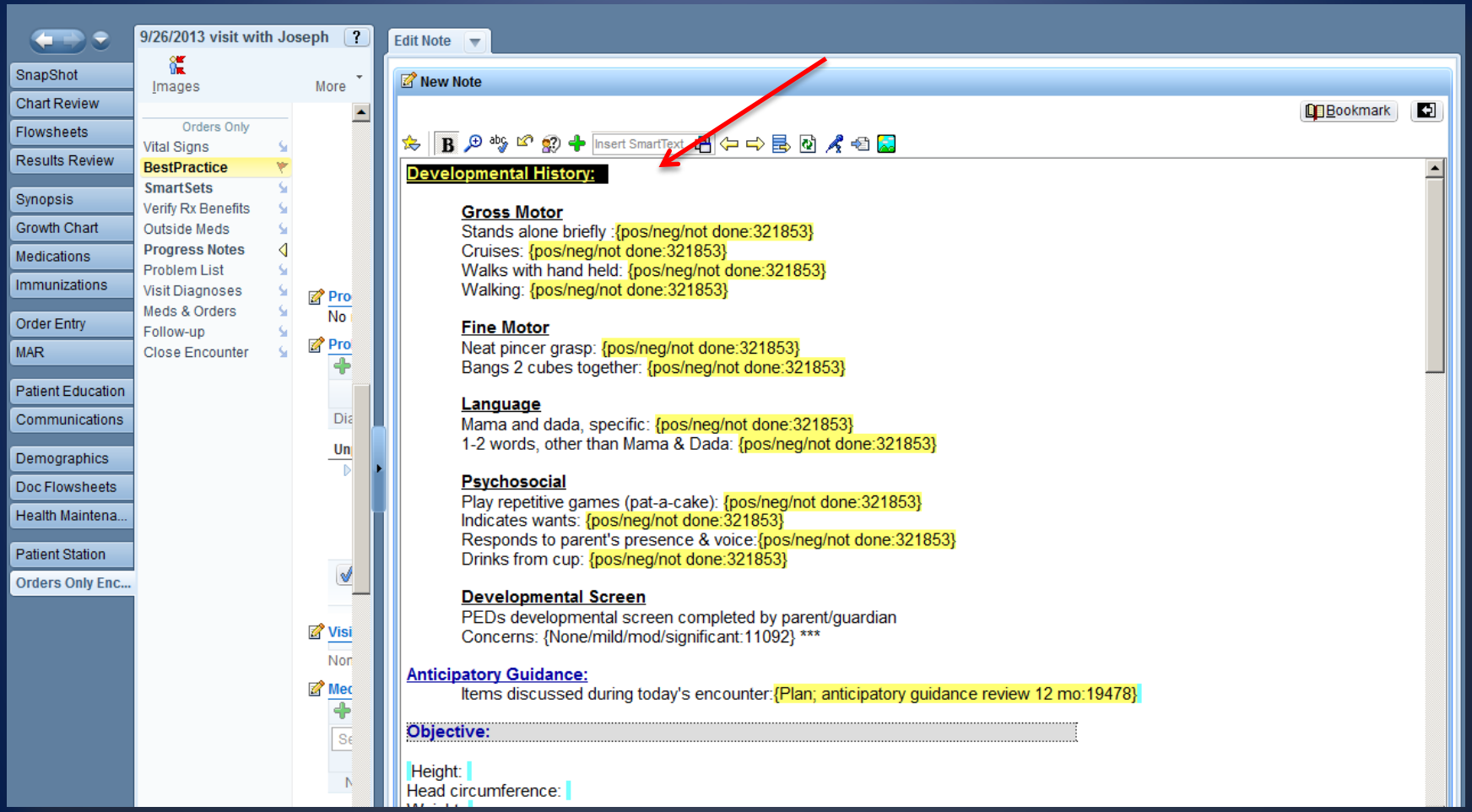
Clinical Decision Tools (hyperlinks)

Initial oral empiric antibiotics for outpatient treatment of pediatric community-acquired pneumonia

Age group	Empiric regimen
1 to 6 months	
Bacterial (not *Chlamydia trachomatis*)	**Infants <3 to 6 months of age with suspected bacterial pneumonia should be hospitalized**
Chlamydia trachomatis	See UpToDate topic on *Chlamydia trachomatis* infections in the newborn
6 months to 5 years	
Typical bacterial*	Amoxicillin• 90 mg/kg per day in 2 or 3 divided doses (MAX 4 g/day), **OR**
	Amoxicillin-clavulanate 90 mg/kg per day of the amoxicillin component in 2 or 3 divided doses (MAX 4 g/day amoxicillin component), **OR**
	For patients with non type 1 hypersensitivity to penicillins:
	- Cefdinir 14 mg/kg per day in 2 divided doses (MAX 600 mg/day), **OR**
	For patients with type 1 hypersensitivity to penicillins:
	- Clindamycin 30 to 40 mg/kg per day in 3 or 4 divided doses (MAX 1.8 g/day), **OR**
	- Erythromycin 30 to 50 mg/kg per day in 4 divided doses (MAX 2 g/day as base, 3.2 g/day as ethylsuccinate), **OR**
	- Azithromycin 10 mg/kg on day 1 followed by 5 mg/kg daily for 4 more days (MAX 500 mg on day 1 and 250 mg thereafter), **OR**
	- Clarithromycin 15 mg/kg per day in 2 divided doses (MAX 1 g/day), **OR**
	In communities with a high rate of pneumococcal resistance to penicillin:
	- Linezolid 30 mg/kg per day in 3 divided doses (MAX 1800 mg/day), **OR**
	- Levofloxacin 16 to 20 mg/kg per day in 2 divided doses (MAX 750 mg/day)
≥5 years	
Mycoplasma pneumoniae or *Chlamydophila pneumoniae*	Erythromycin 40 to 50 mg/kg per day in 4 divided doses (MAX 2 g/day as base, 3.2 g/day as ethylsuccinate), **OR**
	Azithromycin 10 mg/kg on day 1 followed by 5 mg/kg daily for 4 more days (MAX 500 mg on day 1 and 250 mg thereafter), **OR**
	Clarithromycin 15 mg/kg per day in 2 divided doses (MAX 1 g/day), **OR**
	Doxycycline$^{\Delta}$ 4 mg/kg per day in 2 divided doses (MAX 200 mg/day), **OR**
	For skeletally mature patients:
	- Levofloxacin$^{\diamond}$ 8 to 10 mg/kg once daily for children 5 to 16 years (MAX 500 mg/day); 500 mg once per day for children for children ≥16 years, **OR**

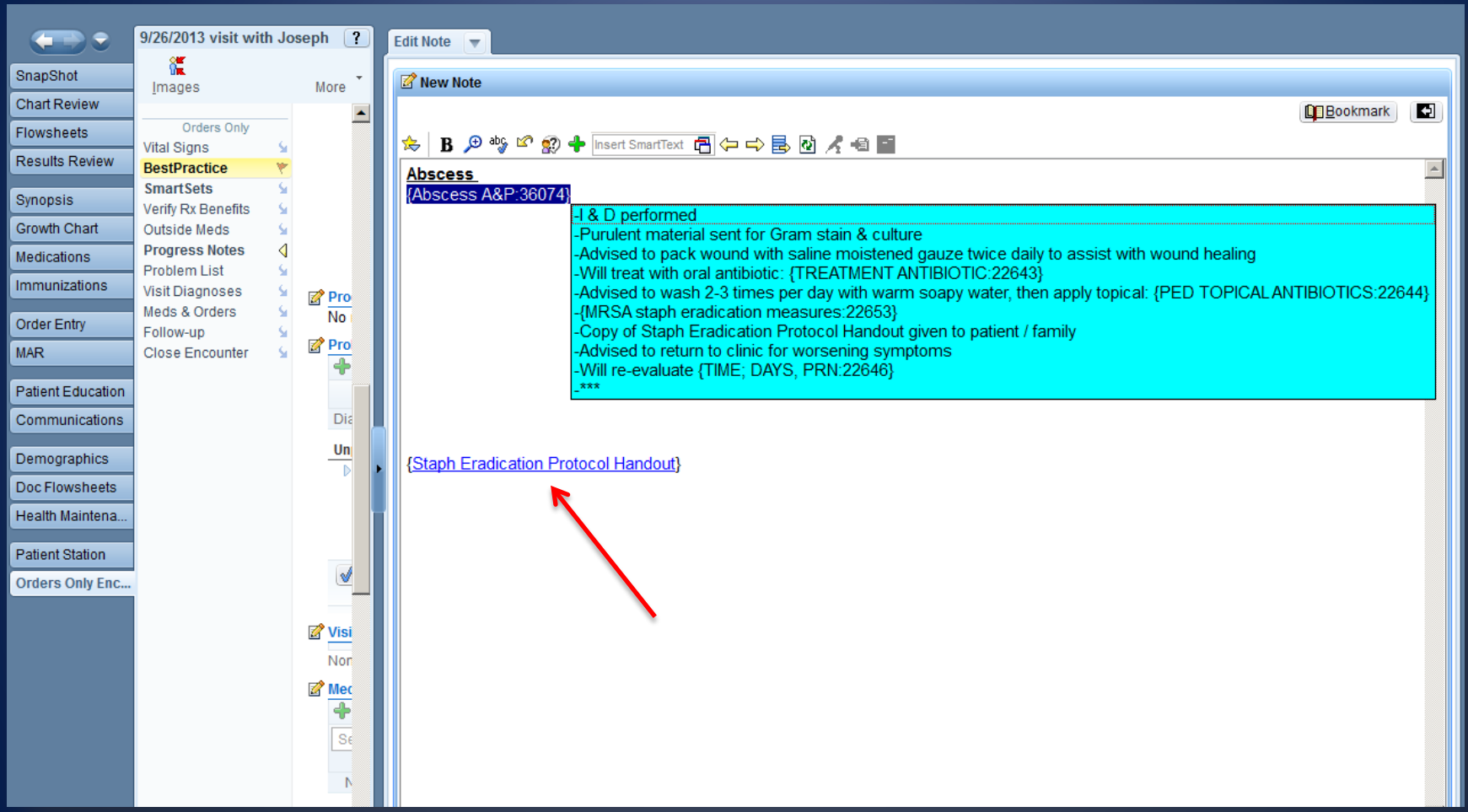
DukeMedicine

Teaching Developmental Milestones



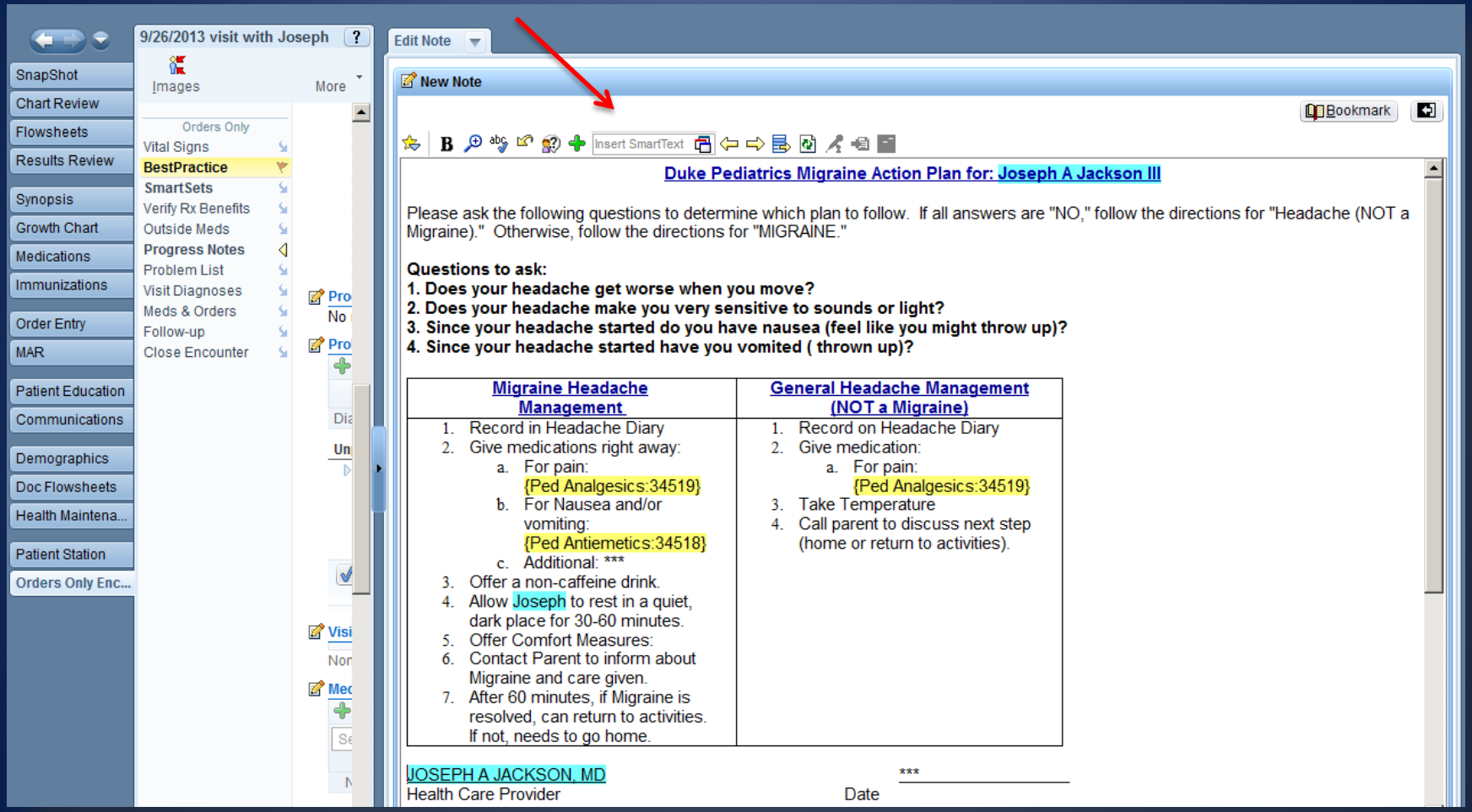
DukeMedicine

Patient Instruction Prompts



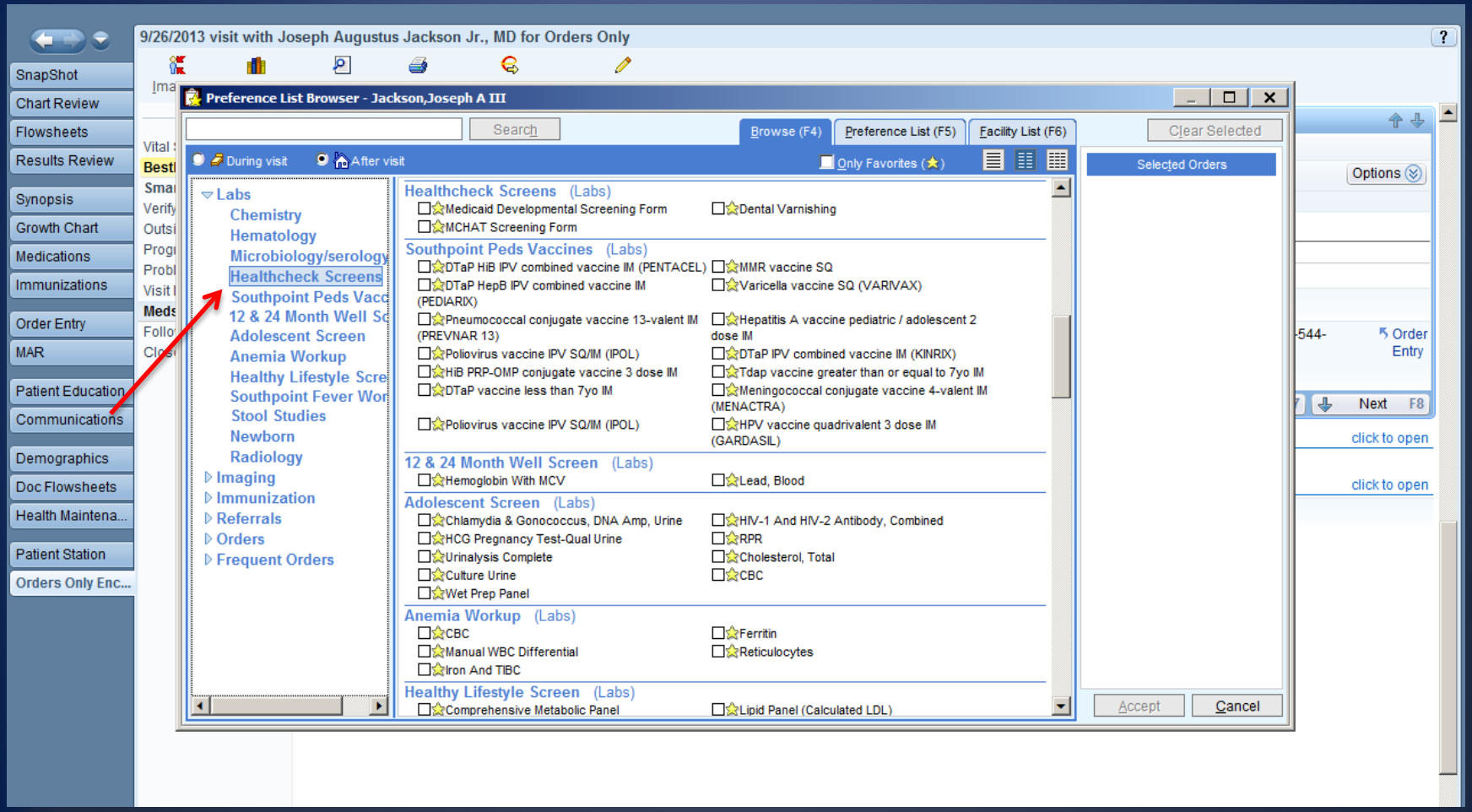
DukeMedicine

Patient Instruction Prompts



DukeMedicine

Order Entry Opportunities



DukeMedicine

Summary

- Medical Educators must strive to integrate students into the electronic Health Record
- Numerous benefits and challenges exist when integrating medical students into the outpatient health record
- The LIC at Duke continues to explore and advance medical student exposure to the EHR

DukeMedicine