Learning Objectives

- Define the functions of a paper chart
- Identify the equivalent functions in an electronic medical record (EMR) system
- Learn which tools are available to supplement EMR functions

*Disclaimer: I am showing examples in EPIC & ARIA because these are in use at Stanford. This is not to be interpreted as commercial endorsement.

Chart Function I: Information Repository

Information about patient
- CATEGORIZED information about patient!
- EMR needs functions to store information for easy retrieval (search functions)

1st EPIC implementation:
- Notes (e.g., weekly Tx summary, consult, …)
- Media (outside records, consent forms …)

Consequences:
- Non-compliance
- Wasted time
- Safety risk

Lesson learned: Develop good filing system!
Chart Function II: Checklist

- MD signatures
- Physics 2\textsuperscript{nd}/weekly check
- How many Tx have been given
- CBCT frequency
- Bolus BID?
- Path/Consent/Staging

Chart Function II: Checklist, Paperless

- Checklists (Questionnaires)
- Questions, responses and timestamps all stored in DB
- Visibility?
- Check of list

Chart Function II: Checklist, Paperless

Sam Brain, PhD:
- Perl
- 14 production programs,
- ~20k lines of code
- Alerts via e-mail
- Run daily, weekly, monthly
- Linux platform

Chart Function II: Checklist, Paperless

Checks of checklists:
- Prescription Written
- Isodose Plan and 2\textsuperscript{nd} Check
- Chart Rounds QA Checklist
- First Treatment Day QA Checklist
Chart Function II: Checklist, Paperless

Checks of checklists works! Efficient?

Chart Function III: Workflow Task

- Chart on your desk -> expectation to act on it
- Visualizes workflow hold-up
- Helps prioritize

Chart Function III: Communication

- Information and communication are different!
- E.g.: Conedown plan without bolus
- Information is in the plan
- Communication to RTT to remove bolus taped on mask?
  - Lesson learned: Defining and improving how critical information gets conveyed.
  - !!! EMR systems have multiple communication channels!!!

Chart Function IV: Workflow Task

- ARIA tasks for:
  - Plan assignment
  - 3D/IMRT plan
  - QA measurement
  - 2nd check
- Email/page for contouring, plan approval
  - Lack of ARIA access in clinic
  - Functionality not available in EPIC
Parallel Charting Systems

- Larger hospital
- ARIA does not have functionality for inpatient workflow & needs
- Hospital system does not have function for Rad Onc flow & needs
- Stanford:
  - ARIA in Rad Inc
  - EPIC in Stanford Hospital
  - Cerner for Lucille Packard Children’s Hospital

Parallel Charting Systems

- Need information flow between systems
- HL7 interface /IHE efforts
- Which interfaces needed:
  - Billing
  - Scheduling
  - Documentation
- Which patient information goes where?
- Budgeting/maintenance of interface install

Summary

- Electronic charts will be in your future
- Great potential for workflow, communication, patient education
- 50 years of paper charts means built-in safety systems
- New safety systems have to be created
- Physicists: central in workflow
  - IT skills
  - understand Rad Onc