MONITORING THE EMR FOR EVENTS OF CLINICAL IMPACT

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Making Treatment Safer

- Identify Hazards
  - Prospective (FMEA)
  - Incident reports
- Intervene
  - Hazard-specific solutions
  - Safety Culture

Near-misses and safety incidents (NMSI) in RT

- Most common causes for error:
  - Communication
  - Treatment planning
  - Following standard procedures
- Other errors:
  - Documentation
  - Equipment/hardware
  - Treatment delivery

Clark et al, 2013
Factors increasing risk for NMSI

- Urgent initiation of treatment
- Specific tumors (head and neck, lymphoma)
- Modality (3D conformal)
- Cross-coverage by physicians
- Pediatric patients

Physician’s Perspective

- Predisposing clinical and technical factors are important for radiation therapy
- There are a number of clinical considerations that can impact quality and safety that are not directly related to therapy delivery
  - Clinical decision making
  - Communication between oncologic services
  - Labwork
  - Medication ordering

Healthcare Information System (HIT)
Usability

- Minimizing the number of steps to complete a task
- Inclusion of visual and auditory warnings/alarms when there could be data entry errors (e.g. feedback)
- Avoiding user information overload
  - Presentation of only the important information
  - Reduce the number of screens with redundant information

EPIC interface
Usability Issues

- Minimalist design
- Useful error messages
- Automatic error prevention
- Flexibility

Electronic Medical Record (EMR)

User-related errors

<table>
<thead>
<tr>
<th>User-related errors</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data entry errors</td>
<td>Clinicians manually type in notes which can result in data entry errors (vital signs, quantities/meds)</td>
</tr>
<tr>
<td>Copy and Paste errors</td>
<td>Copying and pasting from prior note into new note without an appropriate update</td>
</tr>
<tr>
<td>Chart management errors</td>
<td>“Prostarting” a note for patients prior to the visit and the note is never deleted if a patient is a “no show”</td>
</tr>
<tr>
<td>Order entry errors</td>
<td>Some EHR allow a clinician to choose a medication from a pre-determined list. New medications are not in the database so an unlisted med can be entered manually into the database. If the medication is entered incorrectly into the database, incorrect ordering can be perpetuated by other prescribers</td>
</tr>
</tbody>
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Medication management systems

- Adverse Drug Events (ADEs) can cause harm
- Almost half of all medication safety issues occur at the ordering stage
- Detection of ADEs and potential adverse events by self-reporting fails to catch the majority of errors
- Most hospitals use voluntary reporting to track medication safety problems and these systems miss more than 90% of actual adverse events
Addressing the Clinical Concern

- Computer Prescriber Order Entry (CPOE) systems help to standardize medication orders
- Even computerized medication systems require that leaders are engaged in ensuring best practices and decision support for drug selection, dosing, and monitoring are implemented
- NQF Safe Practices, the "4A Innovation Adoption Model"
  - Awareness: Hospitals aware of gaps
  - Accountability: Right teams are accountable for changing workflow/behavior
  - Ability: Leaders invest in those who need new abilities
  - Action: Action must be taken to close and sustain the gaps

Evidence-Based Practice

- Adherence to evidence-based practice improves patient outcomes
- National Comprehensive Cancer Network (NCCN) and ASCO have published evidence-based practice standards for most cancer diagnoses
- Adherence to guidelines nationally is as low as 60%

EMRs and Quality

- Cancer care is often delivered on a case by case basis by well-intentioned providers with no formal guidelines
- Chemotherapy and radiation therapy orders were handwritten
- EMRs have changed that...
EMRs

- EMRs on their own don’t improve quality
- EMRs can improve care when implementation is effective and there is ongoing use of a system to monitor and improve clinical practice

The Mt. Sinai Experience

- Tisch Cancer Institute evaluated their transition to Epic’s Beacon electronic chemotherapy ordering platform
- This transition to electronic chemotherapy ordering offers an opportunity to develop an electronic conduit for evidence-based oncology practice, standardization of supportive care, and enhancement of patient safety
- Utilized the “rate of evidence-based adherence (REBA)” by Adelson et al., Oncology Practice, 2014

Beacon Workflow

- Prepared arrival
- RN assessment
- Order verification
- Chemotherapy administration

- Order signed by MD
- Consent completed
- Chemotherapy pre-reviewed by pharmacist
- Treatment parameters met
- RN documents vitals, allergies, toxicities and medications
- RN releases orders
- Pharmacist verifies order (goal: <30 mins)
- 2nd RN completes documentation prior to chemotherapy administration
- Pre-medications given before chemotherapy
Tips for Successful Implementation

- “REBA” significantly increased with defined workflow in EMR
- Extensive involvement of oncology leadership
- Use of a chemotherapy council to enforce evidence-based practice
- On-going collaboration between clinical operations and information technology

Oncologic Follow-up Guidelines

- The majority of cancer patients receive multi-disciplinary cancer care with coordinated efforts from radiation oncology, medical oncology, and surgery
- After active cancer treatment is completed, multi-disciplinary follow-up is challenging yet important
- Follow-up treatment plans generally include:
  - Regular physical exams with overview of history
  - Monitoring for early detection of new or returning cancers
  - Management of cancer and treatment-related side effects
  - Lifestyle coaching and tips to help reduce cancer risk
  - Referrals to community resources/support groups
Development of a Clinical Care Pathway for Oncologic Follow-up

- Create a general clinical care pathway (or “workflow”) for multi-disciplinary care with oncology and surgery
- Pilot the general pathway with the breast cancer program
- Roll-out “programmatic” clinical care pathways across solid tumor multi-disciplinary groups (e.g. thoracic, sarcoma, pancreatic, etc.)
Goals of a Clinical Care Pathway

- Reduction in redundant/duplicate imaging orders
- Reduction in redundant/duplicate lab orders
- Follow-up visits with multi-D providers at appropriate time intervals
- Reduction in drop-off rate for follow-up/survivorship appointments

Quality Dashboard

Software Interface
Automated Communication between Systems

- Capability of electronic systems to communicate
- Ability to foster the clinical tie between patient on treatment visit and blood test values
- Automated data pull-in of complete blood count (CBC) to match symptoms recorded during on treatment visit

Pitfalls of the Interface

- Clinical information may not translate between the two systems
- Communication between oncology and rad onc
- Consents
  - Treatment consents obtained prior to initiation of therapy
  - Scanned paper consents in Mosaic and electronic consents in Epic
  - Electronic consents adopted hospital wide do NOT connect with the patient’s radiation treatment chart
Recommendations for EMR use

- Establish adverse event reporting system for health IT and voluntary reporting
- Develop and disseminate an educational campaign on the safe and effective use of EMR
- Standardize and allow for interoperability of EMR systems
  - Complete the medical record
  - Take into account usability concerns
  - Improve quality and communication between multi-disciplinary teams

Thank You