Checklist for Implementing an Emergency Department Electronic Medical Record System
Phase I. Selection (Checklist)

Functional Requirements
- Certified for meaningful use
- Integrated (enterprise) vs. interfaced system
- Comprehensive (includes all hospital systems)
- Historically complete (access to all patient records)
- Retrieveable (easy access of records)
- Scalable (allows for expansion)
- Configurable (defines which system elements can be changed by organization versus vendor)
- Usable (efficient, good fit for end-user workflow)

Technical Requirements
- Medical device integration/interface
- Medical device transmits in real-time versus batched download
- Integrated or interfaced for viewing at enterprise level
- Integrated withprehospital and intradepartmental transport devices and/or records as applicable
- eMAR (electronic medication administration record)
  - Electronic medication verification
  - Bar coding with wireless/wired scanner
  - Interface with inpatient record
  - Interface with infusion pumps
- Summary view (extracts data into single view for hand-offs)
- Data dictionary (standard, common language for interoperability)

Clinical Requirements

Patient Arrival
- Quick registration
- Establish “door” time
- Integrated with Enterprise Master Patient Index (EMPI)
- Entry of unidentified patients (John/Jane Doe)
- Entry ofprehospital patients (prior to arrival)
- Alert provider(s) if patient does not arrive when expected
- Patient identity verification
- Merge patient records

Triage Information
- Chief Complaint (choices with free-text option)
- Acuity level
- Basic and/or advanced triage assessments
- Rapid order entry/triage intervention documentation
- Alerts for triage reassessment
Checklist for Implementing an Emergency Department Electronic Medical Record System

**Documentation (Arrival to disposition)**

- **RNs**
  - Flowsheet format (list entries + free-text option)
  - Code management
  - Trauma management
  - Procedure notes
  - Home medications
  - Allergies
  - Medical/Surgical/Family/Social history
  - Alerts for abnormal values by age
  - Alerts for communicable diseases
  - Prompts for required documentation/screening
  - Automatic Chart Deficiency notification

- **Physicians**
  - Alerts for abnormal values by age
  - Alerts for dosing
  - Alerts for communicable diseases
  - Prompts for required documentation
  - Orders/order sets by disease state
  - Note templates by disease state
  - Includes free-text option
  - Includes ability for system to pull data from other sources such as labs, vitals, I&O, etc., via trigger
  - CPT/ICD10 coding enabled/driven
  - Automatic Chart Deficiency notification
  - Voice recognition
  - ePrescribe enabled
  - ‘Scribe’ potential (orders entered by scribe but not executable until signed by licensed independent practitioner (LIP))

- **EMS**
  - Pre-arrival documentation
  - EKG/Rhythm strip transmission

- **Required Documentation/Chart completion indicator for all disciplines**
  - Image management
  - Anatomical drawings (burn man, dermatomes, etc.)
  - Photographic storage (positive patient identification, wounds, forensics, etc.)

- **Discharge**
  - Instructions available in electronic format (if requested by patient)
  - Visit summary transmitted/sent to primary provider (auto fax, electronic data exchange)
  - Prescription writing/transmission
  - Patient education content included
    - Organized by disease state
    - Includes smoking cessation
    - Foreign language translation

- **Disaster/Mass Casualty management**
  - Capability to create face sheets with predesignated account numbers or to allow for rapid preregistration (can use EMS Triage Tag number as part of registration)
  - Capability for Disaster Tracker Board based on EMS triage color scheme
  - Capability to identify and track disaster/mass casualty patients

- **CPOE**
  - Customizable user database (MD, NP, residents, medical students, scribes) to include co-signature where required
  - Standardized order sets
    - Configurable/Customizable
    - Editable on-the-fly
  - Automated trigger for order sets based on diagnosis and/or presentation
  - Clinical Decision Support
    - Drug interaction checking
    - Allergy checking
    - Duplicate therapy checking
    - Pregnancy/lactation checking
    - Medication Reconciliation

Back to Phase I.

**Tracking Board**

- Customizable/configurable/sortable
  - By users
  - By role
  - By location
  - By status
  - Current patient location in ED
  - Current patient status
  - Current order status
  - Isolation status
  - Patient location/activities outside of department
  - Registration requirements
  - Clinical team assignment by location and patient
  - Statuses easily distinguishable (color coding, etc.)
Checklist for Implementing an Emergency Department Electronic Medical Record System

Downtime Considerations
- Statistical uptime and vendor definition
- Information accessibility
  - Scheduled downtimes – Routine maintenance
  - Unscheduled downtimes – System failures
- Downtime forms
- Disaster recovery plan (Late Entry versus Scanning Documentation)
- Shadow server capability

Security Considerations
- Biometric security (fingerprint, retina)
- Login/Sign-on requirements
  - Single Sign-on capability
  - Password expiration
  - Password requirements (alphanumeric, etc.)
- Secure screen/auto sign-off/logout
  - Maintain integrity of data and ePHI
  - Encryption
  - Control access to HIT equipment/systems
  - HIT security awareness/training for all staff
  - HIT security official to monitor/perform audits
  - Policy/process to remove terminated employees from access

Reporting Capabilities
- Preconfigured “canned” reports – quality/quantity
- Customized reports – quality/quantity
- Output (online vs. printed vs. electronic media)
- Ability to stratify data (by provider, diagnosis, chief complaint, etc.)
- Automated reporting to external agencies
- Real-time access to database vs. batched data

Archive Process
- Back-up procedure – daily
  - Shadow server
  - Automatic scheduled (daily)
  - Manually initiated (Ad hoc)
- Back-up to archive (secure, long-term storage)
- Access to archived data in archive – to meet statute of limitations for EMR/HER completion

Census Management
- View only assigned patients
- Protect patient identity
- Public and private tracking boards

Accessibility to EMR
- Direct (from Tracking Board or Census onsite)
- Remote (portal)
  - LIPs
  - Telemedicine
  - eICU
- Device type
  - Bedside/roomside/centralized workstations
  - Workstations on wheels
  - Tablets/handheld
- Connected to online resources/references (e.g., Epocrates, MedScape, Lexi-Comp, Pepid, etc.)
- Spell-check capable (includes medical dictionary)

- Store and calculate times for benchmarking
  - ED arrival time
  - Triage time
  - Provider arrival time (medical screening exam)
  - ED length of stay
  - Lab/imaging/consult turnaround time
  - Admit/Discharge decision time
  - Bed request time
  - Discharge/departure time
- Stored times retrievable for analysis (reports)
- Central tracking board
  - Patient identifiers/sensitive information hidden
  - Monitor size/resolution requirements
- Dashboard view includes:
  - Average LOS
  - Patient load by provider
  - Volume, acuity, and overcrowding metrics
- Access to patient charts directly from tracking board
- Tracking board remains accessible during system downtimes

Back to Phase I.

Back to Phase I.

Back to Phase I.

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Back to Phase I.
Financial Requirements
☐ Professional coding (E&M guideline support)
☐ Medication charges
  ☐ Charge on dispense or administration
  ☐ Initial Rx
  ☐ Subsequent Rx
  ☐ Hourly IV infusion (Start/Stop times)
☐ Charge on documentation
  ☐ Procedural
  ☐ Supplies
☐ Automated facility-related charge (trauma, E&M level, etc.)
Back to Phase I.

Administrative Requirements
☐ Facility Census/Bed Management/Surge Capacity
  ☐ ADT interface
  ☐ Quick-registration (bypass hospital registrar)
  ☐ Rapid/Brief patient information entry for mass casualty
☐ Double-bunking (cohorting)
☐ Capability to build virtual rooms/beds
☐ Staff assignment
  ☐ Straightforward, location-based, automatic
  ☐ Alert system to capture unassigned patients
  ☐ Self-assignment functionality
Back to Phase I.

Accreditation, Legal, and Regulatory Requirements
☐ Vendor contract language addresses liability if patient injury
☐ Organizational policies – requests for EMR/EHR hard copies
☐ Auto-notification by vendor of new regulations
☐ Required reporting process
☐ Records/tracking of selective data (i.e., EMTALA log, etc.)
☐ Auto-notification by vendor of product risk/quality issues
Back to Phase I.

Quality Improvement/Risk Management Considerations
☐ Integrated performance measure functionality
☐ Medical record abstraction – automatic for QI reporting
☐ Audit trail
  ☐ Chart access – List of all personnel accessing patient records
  ☐ Patient protection – Ability to add ID protection for VIP, behavioral health, abuse, forensic, etc., status
  ☐ Changes/corrections – Date/time stamped retrievable history of all data entered
  ☐ Documentation and order entry history
  ☐ Ability to integrate with external auditing applications
☐ Unsigned provider orders – management defined
☐ ‘Refused’ provider orders – management defined
☐ Allows for a failure mode and effects analysis (FMEA) of system
Back to Phase I.

Hardware/Device Considerations
☐ Infection control
☐ Ergonomics
☐ Power/Emergency power
☐ Equipment tracking/anti-theft/security
Back to Phase I.

Vendor Reputation Considerations
☐ Industry rating score/customer support
☐ Reference sites
☐ Economic viability
Back to Phase I.
Phase II Implementation (Checklist)

Assess Organizational Readiness

- Appoint Steering Committee/Task force
  - Establish accountability and commitment; develop charter
  - Establish change management approach
  - Allocate resources
  - Establish and oversee project management timeline

- Collaborative Project Leadership (including, but not limited to):
  - Multidisciplinary Clinical Informaticists
  - Internal and external resources
  - Educators – Training and ongoing support
  - Quality Management Representative
  - HIM Representative
  - Systems Administrators (software maintenance)
  - Database administrator/Report writer
  - Site Preparation coordinator (hardware installation and maintenance)
  - Help Desk coordinator
  - Physician Project Lead/Champion(s)
  - Nursing Project Lead/Champion(s)
  - Administrative Executive Project Lead

- Engage End-user Champions
- Executive
- Clinical
  - Nursing
  - ED Providers (Physicians, APRNs, PAs)
  - Non-ED Providers
- Ancillary Services (including, but not limited to)
  - Respiratory
  - Diagnostic Imaging (all areas)
  - Lab
  - Pharmacy
  - Dietary/Nutrition
  - PT/OT/SLP
  - Case/Care Management
  - Social Work
  - Behavioral Health
  - Pastoral Care
  - Others
- Emergency Medical Services (EMS)
- Non-clinical (including, but not limited to)
  - HIM/Coding/Utilization Review
  - Quality/Safety
  - Risk Management
  - Registration
  - Finance
  - Research and Education
  - Security
  - Biomedical Engineering
  - Supply/Materials Management

Develop Implementation Plan

- Perform current state analysis
- Identify workflows
- Identify workflow experts
- Document workflows
  - Identify challenges/barriers/inefficiencies
  - Identify change points
Perform Future State design by workflows
- Anticipate/mitigate challenges and barriers
- Anticipate and address shortcuts and workarounds
- Identify and communicate design rationales

System Build Activities
- Develop Change Management Structure and Policies
- Unit/Module Functional testing
- Integrated testing – involve end-users in integrated testing

Training considerations
- Didactic
- Computer Based Training
- Practice environment
- Budgetary considerations/additional staffing
- Consider temporary organization-wide changes in vacation policy

Technical Go-Live/Patient and clinical data upload
- Super-users and Go-Live support model with tiered levels of support
- Availability of vendor support
- Assignment of super-users by area
- Back-fill/additional staffing during go-live
- Consider temporary organization-wide changes in vacation policy
- Length of time for technical “floor” support

Budget Considerations
- Software
  - Initial purchase
  - Interface engines
  - Ongoing maintenance
  - Subscriptions/Licensure
  - Disaster recovery
- Hardware (wired versus wireless)
  - PCs
  - Tablets
  - Computers on Wheels
  - Batteries
  - Mounting brackets
  - Keyboard covers
  - Privacy screens
  - Emergency power
- Bar Code scanners
- Infrastructure upgrades
- Physical storage/recharging space
- Cleaning and Disinfection process
- Large Screen Monitors/Tracking boards

Training
- Develop training plans
  - Methods of training
    - Classroom/lecture
    - Computer based
    - Combination
  - Initial training for current employees – who will conduct
    - Number and types of employees to be trained
    - Salary costs
  - Training space capabilities to determine number of staff who can be trained per session
  - Number of sessions to meet the need
  - Plan for make-up sessions
  - Budget for staff while in training
  - Continuous training for new hires – who will conduct
  - Training – prior to initial conversion
  - Training – ongoing for new hires, system enhancements, agency staff, etc.

Support
- Initial conversion (‘Go-Live’) – Super-users, vendor assistance, additional staffing
- Ongoing – 24/7/365 Help Desk
- Committee work
- Clinical Informatics Department support

Conversion Approach
- Staged: Unit-by-unit
- Staged: Function-by-function (example: Begin with results reporting, expand to nursing documentation, followed by order entry, then CPOE, etc.)
- “Big Bang” – all units and all functions or combinations

Select (or Upgrade) Certified EHR/EMR
- Select (or upgrade) Certified EHR/EMR

Back to Phase II.
Checklist for Implementing an Emergency Department Electronic Medical Record System

**Conduct Training and Implement**
- Draft policies
  - Password control/system access/security breach
  - Downtime procedures
    - Information access
    - Data backload
  - Change Control process
- CPOE
  - Order input
  - LIP defined
  - Unsigned orders management
  - ‘Refused’ orders management
- HIM
  - Chart printing/Release of Information
  - Forms design/approval
  - ‘Telephone orders’ management
  - HIPAA considerations (includes Social Media implications)
- Remote Access
- Point of Care documentation

**Achieve Meaningful Use**
- Construct committees for system communications/enhancement requests
- Housewide to include departmental liaisons
- Department-specific
  
  Back to Phase II.

- Report design meets Meaningful Use criteria
- Data submission process
  
  Back to Phase II.
Phase III. Post-implementation (Checklist)

Continuous Quality Improvement

- Workflow optimization
- Vendor upgrades and enhancement management
- User requested upgrades/enhancements based on practice changes, workflow changes, etc.
- User requested changes based on system design
- Help desk call monitoring
- Report validation/ease of use
  - Standard reports
  - Customized reports
  - Routine time frames
  - Ad hoc reports
  - “User friendly” reports
  - Ability for data analysis
- Operations optimization: Compare EMR impact on operations optimization pre- and post-implementation
  - EMR Downtime and disruption statistics as viewed by the end-user
  - Predischarge departures (Left Without Being Seen, etc.) %
- Admitted LOS
- Discharge LOS
- Accuracy of billable charges including, but not limited to:
  - Supplies
  - Medications (bill on dispense versus administration)
  - IV Infusions
  - Medication administration, treatments, and procedures
  - Coding
  - Critical Care times
  - E&M levels

Competency Assessment Considerations – Ensures that users are competent in data entry, data retrieval, policies, and procedures
- Case Study with documentation entered in the test environment
- Computerized simulation of data entry using eLearning authoring software
- Case presentation as an assessment tool
- Games as an assessment tool

Chart Audits Considerations
- Periodic chart audits

Evaluation of Data Collection and Report Usage Considerations
- Analysis data collected should be useful to the end-users (both clinical and management)
Checklist for Implementing an Emergency Department Electronic Medical Record System

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