Computerized provider order entry (CPOE) is a process that allows clinicians to enter patient orders into an Electronic Health Record (EHR). CPOE uses structured fields to allow timely and efficient tracking of medication prescriptions, procedures such as immunizations, referrals, laboratory tests and diagnostic studies. CPOE increases the efficiency of placing orders and reduces the risk of medical errors. Implementation of a computerized provider order entry system requires careful planning, preparation, and participation by a multi-disciplinary team of clinicians, ancillary staff, and other key stakeholders. CPOE includes authorized EHR access by the appropriate individuals to place orders, select a patient, and determine how orders are processed (for example, to an external pharmacy). The subsequent tracking and reconciliation of orders are also an important part of the process to ensure results are available to the prescriber for all orders sent. The following flow charts represent examples of the necessary steps that should be considered when implementing CPOE in a practice.

The flowcharts are:

1. CPOE key steps
2. Diagnostic and lab workflow in-house
3. Diagnostic and lab workflow outside
4. Referral workflow
5. Medication management workflow in-house
6. Medication management workflow outside
7. Vaccination workflow

These tools are basic guides and not intended to be a one-process-fits-all scenario. Practices should carefully review the workflows specific to their specialty, care, services or established protocols to determine whether any steps can be added or omitted.
CPOE Key Steps
These are the key steps a practice may perform when using the CPOE module to place and track orders and results for labs, medications, diagnostic studies, vaccinations, and referrals.

| SYSTEM ACCESS LOG ON | • Develop role based security procedures to ensure staff has appropriate access to patients  
|                       | • Ability to logon on remotely from other locations for continuity of care and to use on-site and mobile devices to send and receive new orders, (for example, eRx). |
| PATIENT SELECTION     | • Searchable data to select the correct patient using full name, gender, date of birth, etc.  
|                       | • Identify and select the correct patient ensuring that orders are not duplicated and results matched |
| ASSESS/DETERMINE      | • Review protocols to determine medical history (for example, allergies, high-risk scenarios, problem lists, medications -- including over the counter medication)  
|                       | • Use of clinical decision support and existing protocols are followed based upon defined treatment plans for patient care |
| COMMUNICATE          | • In-office orders are communicated to assigned staff (for example, blood draws, and referrals)  
|                       | • Out-of-office orders are sent to the appropriate site (for example, outside facility)  
|                       | • Office staff is receptive to incoming clinical documents (for example, consult notes) |
| AUTHORIZE            | • Verification of order done by prescriber  
|                       | • Counter signing of order, as needed, based upon credential status and policies  
|                       | • Final signoff is completed and order is sent for processing |
| TRACKING             | • Develop tracking mechanism for outstanding orders and results  
|                       | • Flagging overdue orders not returned within appropriate time  
|                       | • Develop procedures for follow up of abnormal results with clinician, staff and patient  
|                       | • Availability of supplies to ensure stock can be obtained to fill orders |
| RECONCILE            | • Ensure that orders sent correlate to incoming results  
|                       | • Unidentified results are processed and returned to filler  
|                       | • Follow-up of orders that need to be revised/ reordered |
Diagnostic and Lab Workflow In-House

The diagnostic workflow guides clinical and ancillary staff to perform quality EHR order entry procedures to facilitate safe, accurate, and efficient achievement of test results. The workflow streamlines the process of selecting the correct patient, test, and diagnosis for ancillary and clinical staff to perform test, generate results that are sent to the ordering provider.

1. **Provider**
   - Provider determines a test is needed
   - EHR is accessed and correct patient identified
   - Provider reviews patient history: Outstanding orders, CDS
   - Provider selects appropriate test and diagnosis

2. **Ancillary Staff or Clinician**
   - Order is retrieved by appropriate staff and patient verified
   - Documents printed (e.g., labels for vial, testing area prepped)
   - Specimen obtained or test performed
   - Specimen is processed or test reviewed

3. **Patient**
   - Patient resumes visit

4. **Ancillary Staff**
   - Results sent to provider
   - Follow process for tracking missing results and reconcile
   - Orders reconciled
   - Results recorded in EHR system

**LEGEND**
- Terminator symbol represents the beginning or end of a process
- Process step represents an independent step or task
- Decision step represents a question or decision where there are multiple options
Diagnostic and Lab Workflow Outside

The diagnostic workflow guides clinical and ancillary staff to perform quality EHR order entry procedures to facilitate a safe, accurate and efficient process. The workflow streamlines the process of selecting the correct patient, test, and diagnosis for ancillary and clinical staff to prepare and send test to outside facility to be processed.
Referral Workflow
The workflow process for generating a referral encompasses the selection of a referral menu option, correct patient and appropriate test with related diagnosis in the EHR system. The workflow represents a typical referral process for insurance eligibility, selection of a medical consultant, the performance and interpretation of a test, and the return of results and or opinion to the referring provider.

Provider desires outside consultation
Provider selects correct patient and completes patient history, CDS etc.
Access appropriate EHR referral tab or consultation template
Provider determines appropriate consultant based upon patient’s insurance eligibility history, physical, supporting test and reason for consultation (e.g. continuity-of-care document, CCD)
Attach appropriate supporting test, (e.g. send request to support staff)

Confirm content, consultant, demographic & insurance info
Contact consultant as per practice policy. Print, fax or electronically send referral to consultant, noting appointment information
Use EHR tracking options to regularly check status of consultation
Follow up on consultation status as per office policy

Obtain summary information from referring office
Consultant performs test and results generated
Results sent to referring provider

LEGEND
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Computerized Provider Order Entry Workflows

Medication Management Workflow Outside
The Medication Workflow Profile describes the interoperability and the transactions present in a typical workflow concerning the prescribing, dispensing, distribution and administration of medication. It describes the transactions between the provider, the pharmacy, and the patient to establish an end-to-end operational workflow.

1. **Pharmacy/Patient sends refill request**
2. **Patient's EHR is accessed and verified as correct patient**
3. **Provider reviews current medication list**
4. **Provider writes Rx in Rx Writer and performs dosage check**
5. **Provider reviews drug-drug/drug-allergy and formulary checks**
6. **Does the Provider feel the Rx is appropriate?**
   - **YES**
     - **Provider authorizes the Rx request**
     - **Rx request is electronically transmitted or printed**
   - **NO**
     - **Pharmacy is informed regarding denied request and contacts patient regarding denied request**
     - **Provider contacts patient to book necessary appointment for new Rx**
Medication Management Workflow In-House
The Medication Workflow describes the interoperability and the transactions present in a typical workflow concerning the prescription, dispensing, distribution and administration of medication. It describes the transactions between the provider, the pharmacy, and the patient to establish an end-to-end operational workflow.

Provider determines patient requires Rx

Patient's electronic health record is assessed and verified as correct patient

Provider reviews current medication list

Provider writes Rx in Rx Writer and performs dosage check

Provider reviews current medication list

Does the Provider feel the Rx is appropriate?

YES

Provider authorizes the Rx request

Provider transmitted electronically to patient’s pharmacy or prints Rx

NO

Provider reviews alternate medications as prompted by formulary and/or drug alerts

Provider reviews drug-drug/ drug-allergy and formulary checks

New Rx is generated; sent to pharmacy or printed for patient

Provider transmitted electronically to patient’s pharmacy or prints Rx

New Rx is generated; sent to pharmacy or printed for patient

Provider reviews drug-drug/ drug-allergy and formulary checks

Provider transmitted electronically to patient’s pharmacy or prints Rx

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Computerized Provider Order Entry Workflows

Vaccination Workflow

guides a practice towards selection of an appropriate patient, and administration and documentation of a vaccination in an EHR. The workflow also streamlines the process for the ordering and reporting of a vaccination to the state or regional registry.

1. Provider reviews patient vaccine history
2. Does the patient need vaccine?
   - Yes: Provider identifies needed vaccination
   - No: Provider continues with the exam
3. Using the CPOE feature, the provider locates the needed vaccines
4. Provider reviews patient allergies and interactions
5. Provider places the order for vaccine
6. Immunization is reported to the state/regional registry
7. Is there an allergic reaction?
   - Yes: Vaccine is administered
   - No: Patient continues with office visit or checks out
8. Does the patient need vaccine?
   - Yes: Provider identifies the needed vaccination
   - No: Provider continues with the exam
9. Documentation in System:
   - Dose Administered
   - Lot#
   - CVX code
   - CPT code
   - MFG
   - Route of Administration
   - Given Date
   - Date of VIS
   - Location of administration
   - VFC

Note: vaccines administered to adults require patient consent to transmit them to the registry. Your system must accommodate the consent flag in your vaccination file to the registry for these events.

Additional Processes to consider:
1. Some vaccines require a read, be sure to identify how to track and document results of these vaccines
2. Reporting on the vaccine schedule for pediatrics – know who is due or missing a routine vaccination