## Table 3: Clinical Decision Support in CPOE

| Category of Clinical Decision Support | Description | Contributions to Safety/Quality | Function of Specific Tools |
|---|---|---|---|
| Basic field edits | Setting of basic parameters for contents entered into individual fields including numeric/text, decimal format, required fields; used to edit information entered such as dosage amounts | • Reduced errors due to grossly erroneous information in order fields | • Order field format checking<br>• Required fields<br>• Checks for correct data type |
| Structured orders | Templates for each ordered service that specify data fields to be completed and guide choices with allowable values, defaults, and required fields | • More complete, actionable orders<br>• Reduced errors of omission or commission through field entry appropriate to the type of intervention being ordered (route of administration) and local practice (dosage dispensed in pharmacy, timing of routine blood draws) | • Structured orders: route, dose, frequency, duration<br>• Required fields<br>• Default values<br>• Series orders/recurring orders<br>• Preset allowable value for route of administration<br>• Preset allowable value for available doses<br>• Check against hospital formulary<br>• Display of cost information |
| Groups of predefined orders | Pre-defined grouping of orders that can be selected by user as a starting point for patient-specific orders (order set, clinical pathway) or is displayed automatically (corollary order) whenever linked service is being ordered (e.g., a medication order that should be accompanied by an order to test blood levels of the medication to titrate dosing) | • Reduced errors due to incomplete or erroneous information through use of sets of pre-structured orders with appropriate fields and field contents for each type of intervention being ordered and local practice<br>• Increased compliance with recommended care for particular diagnosis, procedure, and/or phase of management (admission, post-op for a given diagnosis or procedure) | • Standard order sets and ordering regimens<br>• Common order sets<br>• Common orders<br>• Personal order sets and favorite orders<br>• Order sets linked to clinical pathways<br>• Order set by diagnosis<br>• Corollary/linked orders for adjunct interventions (e.g., monitoring)<br>• Vendor-supplied starter sets |
| Order checking (with or without a reference database) | Checking of medication orders for drug interactions and contraindications (e.g., drug-drug and drug-allergy checking, min-max dose ranges, duplicate and therapeutic overlap checking.) For medications, likely to include the use of an industry reference database. Also checking of non-medication orders to duplicates within specified timeframes. | • Reduced errors due to flagging of potential contraindications<br>• Improved quality due to facilitated access to reference information on medications<br>• Reduced ordering of unnecessary duplicate interventions | • Drug-drug interaction checking<br>• Drug-allergy interaction checking<br>• Drug-food interaction checking<br>• Drug-disease interaction checking<br>• Therapeutic duplication checking—within the same therapy (same drug)<br>• Therapeutic duplication checking—within a drug class<br>• Therapeutic duplication checking—with components of combination products<br>• Single dose limit checking<br>• Dose limit checking for each component of a combination product<br>• Medication checking of off-formulary items<br>• IV incompatibility checking<br>• Duplicate order checking<br>• Cost-of-care checking<br>• Exception documentation for alert overrides |

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## Table 3: Clinical Decision Support in CPOE (continued)

| Category of Clinical Decision Support | Description | Contributions to Safety/Quality | Function of Specific Tools |
|---|---|---|---|
| Complex orders with specialized tools | Templates and tools such as dose calculators to guide entry of orders with complex dosing or administration requirements (e.g., taper dosing, sliding scale, alternate day dosing, custom TPN, chemotherapy) | • Reduced errors of omission and commission in complex orders<br>• More accurate dosing calculations<br>• Ability to capture broader range of patient orders with CPOE and include them in checking for contraindications | • Complex administration times and dosages for medication orders<br>• Patient-specific dosing and dosage checking<br>• Sliding scale orders<br>• Conditional orders<br>• IVs<br>• Patient-controlled analgesics<br>• Adult TPN ordering<br>• Adult chemotherapy ordering<br>• Pediatric TPN ordering<br>• Pediatric chemotherapy ordering |
| Order-relevant patient data display | Automatic display of patient information relevant to the intervention being ordered (typically laboratory data to be reviewed before ordering a medication) | • Facilitated review of patient information that might influence choice, timing, or dose of medication or other intervention | • Automatic display of relevant patient information for that order |
| Order-relevant patient data capture | Prompting to verify and/or supply patient-specific information not included in orders, but needed to screen intervention for possible contraindications (e.g., allergy) or to perform necessary calculations (patient weight, body surface area); also includes prompting about clinical appropriateness with documentation of relevant clinical indications | • Expanded availability of relevant patient information for decision support (can serve as additional Q/A check on data routinely captured or supply information not captured electronically)<br>• More appropriate use of targeted interventions and capture of relevant information for subsequent review or analysis of clinical appropriateness | • Requirement for weight, height, or other information necessary for dosing<br>• Requirement for allergy documentation<br>• Linked appropriateness criteria requiring physician entry of data |
| Rules-based prompting and alerts within order entry | Real-time prompting and alerting at the time of order entry, based on explicit rules and a range of patient-specific electronic information. Includes patient-specific dosing (calculator, suggested dose, and/or dosage checking). | • Reduced errors of omission and commission in ordering | • Customer-definable rules combining logic (nested "if's") and available patient data<br>• User-friendly rule writer<br>• Cumulative dose limit checking<br>• Contraindication/dose limit checking based on patient diagnoses<br>• Contraindication/dose limit checking<br>  - based on age/weight<br>  - based on lab studies<br>  - based on procedures<br>• Patient-specific information drives allowable values for specified fields<br>• Facilitated response to recommendation<br>• Context-specific links to clinical knowledge |
| Rules-based surveillance with alerts outside of order entry | Prompting and alerting to reconsider ordered interventions based on new information regarding patient characteristics or status, with notification outside of electronic order entry | • Reduced delays in re-evaluating patient management strategy based on new information about the patient | • Expiring orders alerts<br>• Alerts based on new patient information—allergy or diagnostic test result<br>• External notification<br>• Coverage list<br>• Escalation |

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