ISMP Guidelines for Safe Electronic Communication of Medication Information

Safe Presentation of Drug Names

1. When expressing a generic drug name, use all lowercase letters (unless using tall man letters as mentioned in item #5) as the primary expression of drug nomenclature, ensuring that each matches the US Food and Drug Administration (FDA)-approved nomenclature so that electronic medication records agree with all carton and container labels.

2. When expressing a generic drug name, do not include the salt of the chemical unless there are multiple salts available (e.g., hydr**OXY**zine HCl and hydr**OXY**zine pamoate) or the salt alters the drug release (e.g., flu**PHENAZ**ine HCl and flu**PHENAZ**ine decanoate) and thus conveys meaningful information. If the salt is used as part of the name, display the full name of the salt unless an abbreviation has been approved by USP (i.e., K [potassium], Na [sodium], HBr [hydrobromide], and HCl [hydrochloride]). The salt should follow the drug name.

   Comment: The symbols Na and K are intended for use in abbreviating the names of the salts of organic acids, but these symbols should not be used when the word sodium or potassium appears at the beginning of an official drug name (e.g., Na bicarbonate is not acceptable because it may be misread as "no bicarbonate").

3. When expressing a brand drug name, use an uppercase first letter. Trademark symbols (e.g., TM, ®) should not be used.

   Comment: Although the use of all uppercase letters is a standard convention for trademarks, mixed case and lowercase letters are more unique and distinguishable than all block-like uppercase letters, which look similar and are more difficult to read, especially in low lighting.[1] Also, using all uppercase letters to express brand names does not allow for the use of tall man letters when indicated, as mentioned in item #5.

4. Include the word "Mix" and any numerical values that are part of the brand name for fixed combination insulin products (e.g., Novo**LOG** Mix 70/30) together on the same line on all computer screens, medication administration records (MARs), and other electronic forms of communication.

5. Use **bolded**, UPPERCASE tall man letters (e.g., vin**CRIS**tine, vin**BLAS**tine) for specific groups of dissimilar letters in look-alike drug name pairs or trios to visually differentiate them on electronic screens. This helps minimize the risk of selecting the wrong product, particularly when medication names appear alphabetically in drop-down menus and search results. To promote standardization of the letters presented in UPPERCASE and **bold** font, follow the recommendations on the ***FDA and ISMP Lists of Look-Alike Drug Names with Recommended Tall Man Letters*** (www.ismp.org/ext/78).

   Comment: FDA encourages manufacturers to visually differentiate specific look-alike drug names identified with its Name Differentiation Project (www.ismp.org/ext/77) using the recommended tall man letters on all packaging and labeling materials.

6. For drug names ending with the letter "l," capitalize the "L" (e.g., propranololL 20 mg) to avoid confusion with the numeral 1 in the dose that follows the drug name. See item #27 for a recommendation to provide adequate space between the drug name and dose.

   Comment: A lowercase letter "l" at the end of a drug name has been confused as the numeral "1" and mistaken as part of the dose, particularly if adequate space has not been provided between the drug name and dose (e.g., propranolol20 mg has been mistaken as propranolol 120 mg). Always leave a space between the end of the drug name, the dose or strength, and the unit designation (e.g., mg).

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7. Avoid the use of superscripts and subscripts with drug names unless they are a necessary part of the drug name (e.g., vitamin K_1). When superscripts or subscripts are necessary, the letter or number should be expressed above or below the line, not on the line (e.g., K_1 not K1, which could be misunderstood as potassium iodide).

8. Express suffixes (e.g., SR, CD, CR) that are part of the brand name (e.g., Cardizem CD, Cartia XT) within the drug description field. When expressing modified-release formulations of generic medications, use terms that accurately and unambiguously convey the release formulation (e.g., 12-hour extended-release, 24-hour extended-release).

   *Comment: When expressing an extended-release formulation of a generic medication that does not share the same pharmacokinetics with similar medications with which it may be confused (e.g., three types of 24-hour extended-release formulations of dil**TIAZ**em that are not AB rated), include the corresponding brand name.*

9. When possible, avoid expressing a drug name in a manner that incorporates a number (e.g., 5-fluorouracil, 6-mercaptopurine), as these numbers have been confused with the dose or number of tablets/capsules to be administered. Express the drug name without the number if it is not needed or is not part of the official drug name (e.g., fluorouracil, mercaptopurine).

10. Do not abbreviate drug names or refer to them by shortened names. Exceptions may be made for multi-ingredient drug formulations, especially vitamins, when there are drug name field space constraints; however, drug abbreviations should **NOT** be used for any medications on the ***ISMP List of High-Alert Medications*** (in Acute Care Settings [www.ismp.org/node/103], Community/Ambulatory Settings [www.ismp.org/node/129], and Long-Term Care Settings [www.ismp.org/node/130]).

    *Comment: Drug name abbreviations and shortened names have frequently been misunderstood, sometimes leading to harmful or fatal medication errors. For example, MTX for methotrexate has been misunderstood as mito**XANTRONE**; MSO_4 for morphine sulfate has been misinterpreted as magnesium sulfate; and "nitro drip" has been misinterpreted as either nitroglycerin or nitroprusside infusions.*

11. Avoid using drug regimen or protocol acronyms without defining the regimen or protocol at least once within the order set or other form of electronic communication. Avoid the use of all acronyms that may have a dual meaning or may be confused with other common acronyms (e.g., TAC may mean Taxotere, Adriamycin, and cyclophosphamide; or tetracaine, Adrenalin, and cocaine).

    *Comment: A drug regimen or protocol acronym that also represents a common medical term can be confused, even if defined in an order set. For example, AC could mean Adriamycin and Cytoxan, or before food/meals (ante cibum); CVP could mean central venous pressure or cyclophosphamide, vin**CRIS**tine, and predni**SONE**.*

12. Do not use slang or outdated terminology when referring to medications or solutions (e.g., referring to a saline lock as a heparin lock).

Safe Presentation of Doses, Dosing Units, Weights, Measures, and Directions

13. Use standard terminology and safe expressions that are clear of ambiguity when expressing doses, dosing units, weights, measures, and directions for use. Avoid the use of known error-prone abbreviations, symbols, and dose designations, including those on the organization's "Do Not Use" list and the ***ISMP List of Error-Prone Abbreviations, Symbols, and Dose Designations*** (www.ismp.org/node/8). Examples most relevant to electronic communication of medication information include the following:

    a. Do not use trailing zeros at the end of a dose for medications/solutions (e.g., 5 mg, never 5.0 mg).

    b. Use leading zeros for doses less than one measurement unit (e.g., 0.3 mg, never .3 mg).

    c. Spell out the word "units." Never use the abbreviation U, which easily can be mistaken as a zero, causing a 10-fold overdose. Never abbreviate international units as IU; this measure, which has been misread as IV (intravenous), can be expressed as "units" alone.

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d. Do not use the abbreviations M or MM for "million" and K or M for "thousand" when expressing doses.

Comment: These abbreviations may not be understood or may be misinterpreted. For example, M has been used to abbreviate both "million" and "thousand" because "million" begins with the letter M, and M is also the Roman numeral for "thousand."

e. Include properly spaced commas for dose numbers expressed in thousands or millions (e.g., use 500,000 units, never 500000 units).

*Comment: Use commas to separate digits expressing doses in thousands or millions **only** in the US. Commas sometimes are used in place of decimal points in other countries.*

f. Express weights and measures in a standard fashion using USP standard abbreviations for dosage units as follows:

- cm = centimeter(s)
- m (lowercase) = meter(s)
- kg = kilogram(s)
- g = gram(s)
- mg = milligram(s) (do not use mgs)
- mcg = microgram(s) (do not use the Greek letter mu [μ], which has been misread as mg)
- L (uppercase) = liter(s)
- mL (lowercase/uppercase) = milliliter(s) (do not use cc, ml, mLs, or mls)
- mEq = milliequivalent(s)
- mmol = millimole(s)
- nanog = nanogram(s)

Comment: The abbreviation nanog for nanogram, which is not a standard USP abbreviation, can be used when expressing certain medication doses in electronic devices such as smart infusion pumps (e.g., nanog/kg/min), if space limitations prohibit full expression of the dosing unit (e.g., nanogram/kg/min). If ng is used as an abbreviation, it can be misinterpreted as mg.

g. Do not include a period after dosage unit abbreviations (e.g., use mg, never mg.).

h. Do not use apothecary system designations or symbols (e.g., grains, drams, minims, ounces), or household measurements (e.g., teaspoons, tablespoons).

Comment: Explicit apothecary or household measurements may be used to express the directions for mixing dry ingredients to prepare topical products (e.g., dissolve 2 capfuls of granules per gallon of warm water to prepare a magnesium sulfate soaking aid).

i. Use only Arabic numerals to express doses; never use Roman numerals (e.g., use 5, never V).

j. Do not use IN as an abbreviation for intranasal (it may be confused with IV [intravenous] or IM [intramuscular]); write out the word "intranasal" or use "NAS."

k. Do not use IT as an abbreviation for intrathecal (it may be confused with other routes, intratracheal, intratumor, inhalation therapy, intratympanic); write out the word "intrathecal."

l. Do not use the abbreviations o.d., OD, q.d., QD, or q1d for daily; write out the word "daily."

m. Do not use the abbreviations q.o.d. or QOD for every other day; write out "every other day."

n. Do not use the abbreviation "d" for "day" or "dose" with parameter-based dosing formulas (e.g., mg/kg/d), which could be interpreted as either "day" or "dose" (e.g., mg/kg/day or mg/kg/dose); write out "day" or "dose."

o. Do not use the abbreviations AD, AS, AU, OD, OS, and OU, to direct into which ear(s) or eye(s) to instill a medication; write out the directions clearly (e.g., left ear, right eye, both eyes).

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p. Do not use the abbreviation UD (intended to mean as directed).

q. Do not use the abbreviation SS (intended to mean single strength, half, signs and symptoms, or sliding scale).

r. Do not use the abbreviations sq or sub q for subcutaneous or subcutaneously; use "SUBQ" (all UPPERCASE letters) or write out the word "subcutaneous."

s. Do not use > or < signs; spell out the intended terms "more than" or "less than."

t. Express doses that cross a threshold from one dosing unit of measure to the next possible dosing unit of measure (e.g., mcg to mg, mg to g) the same way the dose or concentration/strength is expressed on the product label, without using unnecessary zeros (e.g., 1 g preferred over 1,000 mg, unless this differs from the product label). For specific drugs, once a threshold is crossed (e.g., mcg to mg, mg to g), continue using that dosing unit of measure for each subsequent dose (e.g., vancomycin 750 mg, 1 g, 1.25 g, 1.5 g; **not** 750 mg, 1 g, 1,250 mg, 1,500 mg).

u. Do not express the strength of single-entity injectable drug products as a ratio (e.g., **EPINEPH**rine 1:10,000, neostigmine 1:1,000). Instead, express the strength in terms of quantity per mL (e.g., **EPINEPH**rine 0.1 mg/mL, neostigmine 1 mg/mL). Exception: local anesthetics (e.g., lidocaine 1% and **EPINEPH**rine 1:100,000).

See item #29 for a recommendation to provide adequate space in corresponding fields so these recommendations can be followed.

14 Do not use outdated or potentially confusing medical jargon when describing the route or directions for use (e.g., use PO for clinicians or oral for consumers instead of per os).

15 For acceptable route abbreviations, use all uppercase letters—IV, IM, SUBQ, PO, and NAS, without spaces or periods between the letters.

16 For acceptable frequency abbreviations, use all uppercase letters—BID, TID, QID, and HS, without spaces or periods between the letters. For frequencies according to a specific time, use "q" for "every," "h" for "hour(s)," and "min" for "minute(s)." Display time-specific frequencies without spaces or periods between the abbreviations and the time, and use Arabic numerals only (e.g., q4h, q5min).

17 Use explicit words when communicating medication doses to be administered just once (e.g., warfarin 5 mg PO for 1 dose, rather than "x 1") or for a set number of doses (e.g., ce**FAZ**olin 1 g IV q6h for 3 doses, rather than "x 3").

18 Use one consistent way of expressing half tablets and doses greater than 1 that are half way between two whole numbers. When expressing half tablets, text (e.g., half tablet) or reduced font-size fractions (e.g., ½ tablet) are preferred over typical font-size numerals with slash marks (e.g., 1/2 tablet).

Safe Presentation of Product Selection Menus and Search Choices

19 If mnemonics or short names are permitted to search for products or populate fields without entering the full drug name, require entry of a minimum of the first 5 letters of the drug name.

*Comment: The use of mnemonics or short names that employ the first two, three, or four letters of the drug name (e.g., "met"), skipped character abbreviations (e.g., "ctx"), or a combination of the first few letters and dose (e.g., "meth10") has led to presentation of similar looking drug names on the screen, which has resulted in selection errors or population of a field with an unintended drug. For example, entering "met" has led to confusion between methylphenidate, methadone, met**OL**azone, methotrexate, met**FORMIN**, and metro**NIDAZOLE**; entering "cis" has resulted in populating the drug name field with cisatracurium when **CIS**platin was intended; entering "ato" has led to confusion between atorvastatin and atomoxetine; entering "ctx" has led to selection of cyclophosphamide (Cytoxan) instead of cef**TRIAX**one; and entering "meth10" has led to confusion between methadone 10 mg and methylphenidate 10 mg.*

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20 When the drug name, dose/strength, and dosage form appear together on product selection menus and search choices, list the generic and/or brand name first, followed by the strength and the dosage form (e.g., timolol [or Timoptic *if brand to be dispensed*] 0.5% ophthalmic solution; diaze**PAM** 5 mg tablet). For modified-release formulations of medications, list the terms that convey the release formulation after the product name (e.g., dil**TIAZ**em 24-hour extended release [Taztia XT] 180 mg capsule). Also see item #23.

21 When the drug description field allows for both brand and generic names on product selection menus and search choices, display the brand name of a generic product, and/or the generic name of a brand product, to aid in recognition of the correct drug, particularly for combination products, drugs with look-alike names, vaccines, and other medications with names that might otherwise be confused. The brand or generic product intended to be prescribed should be listed first, and the reference drug name provided for clarification should appear in parentheses after the intended product. The intended e-prescribing drug name and the reference drug name in parentheses should be sourced from compendia in a standardized format.

22 During drug selection searches, present possible choices alphabetically, listing medications with multiple strengths from the lowest to highest strength.

Comment: Be sure electronic systems do not list doses numerically by the first digit only (e.g., never 1 mg, 10 mg, 2 mg, 20 mg, 3 mg, 30 mg; always 1 mg, 2 mg, 3 mg, 10 mg, 20 mg, 30 mg).

Safe Presentation of Complete Medication Orders or Prescriptions

23 For electronic displays during order/prescription review, on MARs, and on inpatient product labels printed from electronic systems:

When the drug name, dose/strength, and dosage form appear together, list the generic and/or brand name first, followed by the dose, strength (if different than the dose), and the dosage form (e.g., timolol [or Timoptic *if brand to be dispensed*] 0.5% ophthalmic solution; diaze**PAM** 5 mg tablet). For modified-release formulations of medications, list the terms that convey the release formulation after the product name (e.g., dil**TIAZ**em 24-hour extended release [Taztia XT] 180 mg capsule). Also see item #20.

24 Present electronic orders as prechecked (automatically initiated without selecting) ONLY if they are appropriate or needed for at least 95% of patients and would not potentially harm the other 5% of patients (e.g., prechecked orders for a hypoglycemia protocol for patients being prescribed insulin, prechecked orders for naloxone for patients being prescribed opioids).

25 On MARs, include the name(s) of the drug and the patient-specific dose (not just the strength dispensed) on the same line/entry. Avoid situations, including automatic wraparound of entries, that result in listing the name of the drug and available dosage strength on the first line, and the patient-specific dose on the next line.

26 On MARs or other medication lists, do not include the strength (e.g., U-100, U-200, U-300) immediately after the name of the insulin (e.g., Humu**LIN** R U-100), except for regular insulin U-500 (Humu**LIN** R U-500). For all strengths other than U-500 insulin, list the dose after the insulin name, and the strength after the dose (e.g., Humu**LIN** R 20 units [U-100]). For U-500 insulin, include the strength before the dose (e.g., Humu**LIN** R U-500 60 units).

27 When the drug name, strength/dose, and the unit of measure appear together, require a space between the drug name and strength/dose, and between the dose and unit of measure to avoid misinterpretation (e.g., 10Units has been misread as 100 units).

Electronic System Design Features: Medication Information

28 When expressing electronic text, use easy-to-read, larger size fonts (e.g., 11- to 12-point font) that are not densely compressed and are without embellishments.[1,2]

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Comment: Fonts designed specifically for the screen are preferred. Familiar sans serif fonts without embellishments are superior for body text, and serif fonts are best used for headings and small print. However, serifs are less important if the font style is not extreme or unusual.

29 Provide adequate space for items in databases and data fields used to communicate drug names, dosing units, routes of administration, and frequencies. Two- or three-character fields force the use of potentially dangerous abbreviations.

30 If numbers are needed to sequence inpatient medication orders, provide adequate space between the numbers and the drug name to prevent misinterpretation of the number as the medication dose. (Each outpatient medication prescription should be transmitted separately.)

31 Automatically round weight-based doses greater than 10 dosing units (e.g., 10 mg, 10 mcg, 10 g) to the nearest whole number or dosing unit (e.g., 12.59 mg rounded to 13 mg). Assure that automatic rounding of the dose to the nearest whole number never results in a dose that is greater than or less than 10% of the originally prescribed dose.

32 For weight-based/body surface area-based medication orders for pediatric, oncology, elderly, and obese patients, include a required field for the mg/kg dose (or mg/kg/hour, mcg/kg/min, mg/m^2, or similar parameter-based dosing formula), and a field for the total dose, which should be calculated (and often rounded and/or standardized) automatically by the electronic system. See item #13(n) for a recommendation to avoid the use of "d" in dosing formulas (e.g., mg/kg/d), which could be interpreted as either "day" or "dose."

33 Provide a field to enter the purpose/indication for all medications prescribed electronically. Require entry of the purpose for the following types of medication orders: all PRN (as needed) medications; look-alike drug name products that are known to be problematic (few look-alike name pairs are used for the same purpose); and high-alert medications that have different dosing based on the indication (e.g., vasopressin may be used to treat diabetes insipidus or gastroesophageal variceal hemorrhage).

Comment: Communicating the drug's indication reduces the risk of improper drug selection and offers clues to proper dosing when a medication has an indication-specific dosing algorithm.[3]

34 Require entry of the minimum components of a complete medication order or prescription (e.g., drug name, metric dose/strength, frequency, route, indication as required [see item #33]). Specific examples follow:

a. Do not allow doses prescribed only by volume, number of tablets, or number of vials/ampuls (examples of exceptions include combination liquid medications available in a single concentration, combination oral solid medications available in a single strength, vaccines, eye and ear drops, creams and ointments, liquid multivitamins, and mineral oil).

b. Do not allow single orders for medications with range doses, various frequencies, or more than one route of administration. If orders for the same drug are prescribed at different doses, frequencies, and/or routes, require separate orders for each that specify objective measures to guide determination of which dose to administer at which frequency and by which route.

Comment: Examples of measures that may be used to guide determination of the dose, route, or frequency include a pain assessment (e.g., severity, chronicity, quality of pain; prior response to analgesics), a functional status assessment (e.g., impact on activities of daily living), NPO status, and ability to tolerate oral medication.

35 Limit the need for free-text entries during prescribing by ensuring that required designated fields are provided to promote complete and clear prescriptions and orders.

36 Provide any "special instructions" and/or "note to pharmacy" fields in a prominent location where they are noticeable, with a menu of choices related to common precautions for specific drugs.

37 Provide a field for free-text entries by pharmacists to communicate additional information about drug administration not included in the order or prescription, which appears in a prominent location clearly visible with the drug entry on the MAR for nurses, or on the pharmacy label for consumers.

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38 Provide a mechanism to facilitate safe order entry of complex medication regimens (e.g., chemotherapy, electrolyte solutions, parenteral nutrition) or medications that require a tapering dosing schedule (e.g., steroids) so that the orders appear clearly, in a logical sequence, and include all required elements (which may be different than for routine medications).

39 Provide a mechanism to place a dose or doses of a medication on hold under specified conditions (e.g., heart rate less than 50 beats/min, international normalized ratio [INR] above 3.6). Provide a mechanism to document an anticipated end date and time, if known, and/or criteria for when to resume a medication on hold (e.g., hold doses until daily INR below 3.6).

40 Provide users with ways to emphasize medication- or patient-related warnings or other important clinical notes related to prescribed medications (e.g., upper- and lowercase letters, contrasting color, bolding, italicizing, choice of fonts, audible and visible alerts). When appropriate, warning statements should be presented in the active voice using affirmative statements (e.g., IV use only) instead of negative statements (e.g., Not for intrathecal use). This helps ensure that people understand the meaning of the hazard even if they do not read every word, thus avoiding errors (e.g., missing "Not" but seeing "for intrathecal use").[1]

41 Provide users with the ability to search by brand name (including an inactive brand name) or generic name, and link all means of accessing a name to default to a description of the medication. Also, organize generic and brand names by dosage form (e.g., multiple gentamicin products should be organized by parenteral, ophthalmic solution, cream, and other dosage forms) in drop-down menus and search results. See item #22 for a recommendation regarding the order in which to organize medications that display after a search.

42 In inpatient settings, provide users with the ability to clearly communicate directions for medications prescribed for specific, non-routine administration times or under certain conditions (e.g., after dialysis on dialysis days, while NPO, until tolerating liquids, prior to surgery, start first dose now, after a missed or delayed dose).

Comment: When a scheduled medication is administered early or late at a nonstandard time, an agreed-upon method (e.g., dosing window matrix, staggered dosing times) should be used to convert subsequent doses to the standardized dosing schedule.

43 Provide prescribers with the ability to electronically communicate the cancellation or discontinuation of outpatient prescriptions that have been previously transmitted (i.e., CancelRx transaction from NCPDP SCRIPT). Provide pharmacists with the ability to transmit approval or denial of the request back to the prescriber to close the loop on the message.

44 Provide users with the ability to link certain medications to ONLY the appropriate routes of administration and to filter out the ability for linking to wrong route selections. For example, vin**CRIS**tine injection should link only to the IV route of administration.

Comment: Off-label use of some medications may allow for safe administration by an alternate route of administration (e.g., ophthalmic drops administered in the ear). However, users should have the ability to link medications, particularly high-alert medications, to appropriate routes only if administration by the wrong route can cause patient harm.

45 Provide users with the ability to prescribe or enter certain medications at ONLY the appropriate frequencies of administration. For example, fenta**NYL** transdermal patches should only be permitted every 48 hours or 72 hours, not daily.

Electronic System Design Features: Patient Information Associated with Medication Safety

46 To ensure automatic screening of patient allergies against prescribed medications, provide fields that require electronic documentation of known patient allergies (including medication, environmental, and food allergies) and previous adverse drug reactions (ADRs)/sensitivities, paired with a description of the type of reaction for each allergy and/or ADR/sensitivity, prior to the entry of medication orders (except in emergencies).

47 Prominently display all allergy, ADR, and sensitivity information, including the type of reaction, in a consistent location so it is viewable by the user immediately before or during order entry, order verification, and medication administration.

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(Allergy alerts do not replace the need to visualize this information prior to entering and verifying orders or administering medications.)

48 Allow the entry and display of ONLY metric measurements of actual patient height (in cm only) and actual patient weight (in kg only [or grams for low-birth-weight infants]), and provide a field to document the date the height and weight were collected.

49 Provide users with a system that alerts if the patient's documented weight or height exceeds an age-based weight/height comparison threshold that suggests the possibility of an error (e.g., entering weight in pounds instead of kg, switching height and weight entries, entering an erroneous weight that exceeds a facility-defined percent gained or lost).

50 Display patient identification information containing at least two unique identifiers in a prominent area (e.g., upper left-hand corner) of all screens/windows in a consistent order so that users can efficiently and accurately find and verify patient identity. The information should continue to be displayed in the same location regardless of scrolling or other navigational mechanisms to move the screen/window.

51 Provide a mechanism that enables users to enter information or orders on only one patient's electronic record at a time. Users should be able to maintain only one record in input mode (unrestricted access to input information) at a time, along with one other record in view-only mode to coordinate care between two patients (e.g., mother and newborn). A deliberate and visually distinguishable action should be required to transition from one record to another record.

52 Allow clinicians to print a copy of all medications prescribed at discharge, or at the end of an outpatient or office visit, in a format that includes the drug name (generic, and brand if prescribed), dose, route, frequency, indication, and special instructions or precautions. In inpatient settings, include the time that any prior doses were given before discharge or the date and time the next dose is due. The list of medications prescribed at discharge, or at the end of an office visit, should include medications taken previously that have been discontinued, with a clear indication that these medications should be stopped.

Other Topics Requiring Further Investigation and Standards

53 Use human factors data to select the appropriate character, text, and colors to use with electronic displays of information. For example, the contrast ratio for alphanumeric characters/text to the self-luminous computer screens or displays should not be below 7:1. Never display pure red text on a pure blue background or vice versa; never use pure blue or red text on a black background; and never use pure blue for text or fine details on electronic displays.[2]

54 A standard process is needed for expressing combination and compounded products, including products that are often referred to by coined names (e.g., magic mouthwash).

Comment: USP is currently developing such a standard.

References

1) Wogalter MS, ed. *Handbook of Warnings*. Mahwah, NJ: Lawrence Erlbaum Associates; 2006.
2) FAA human factors: Visual displays. Federal Aviation Administration (FAA) website. www.ismp.org/ext/151
3) Schiff GD, Seoane-Vazquez E, Wright A. Incorporating indications into medication ordering—time to enter the age of reason. *N Engl J Med*. 2016; 375(4):306-9.