The Art and Science of Pre-printed Physician Orders

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Abstract

Defining how pre-printed physician orders are developed within a hospital has the potential to positively impact care, services, safety and patient outcome. When well designed, pre-printed physician orders improve interdisciplinary integration in care and promote accurate communication. Designing good pre-printed orders is both an art and science that all disciplines and hospitalized patients can benefit from.

Key words

Pre-printed orders, writing orders, physician orders.

Written communication is not always easy to interpret. What is so obvious to the writer may take on an entirely different meaning for the one reading it.

Pre-printed physician orders in the hospital setting are no exception. Quite often pre-printed orders are created on the home computers of physicians. Frequently, old orders are hoarded, copied and distributed from nursing units. These orders show up suddenly on patient charts with confusing directions, outdated medications, unapproved abbreviations, conflicting instructions, poor legibility and letterhead from other hospitals. The potential for miscommunication and error is prevalent. And while the physician may

rightfully feel he or she is responsible for the content – clear, accurate and concise communication requires a team approach.

This article describes our efforts (some of it through trial and error, some of it supported by research) to define pre-printed orders by physicians that improve multiple disciplinary integration and accurate communication while reducing variation. Within these pre-printed orders there lies the opportunity to impact the healthcare organization and process of care - and ultimately, patient outcomes.

The Advantages to Well Designed Pre-printed Physician Orders

Physician orders for hospitalized patients have the unique characteristic of effecting multiple diverse disciplines and processes. For example, Physical Therapists, Dieticians, and Social Workers may be involved in the care of the same patient as well as Case Management, Infection Control and Concurrent Reviewers from Performance Improvement. When well designed, pre-printed orders focus that broad range of perspectives onto the care of a single patient.

Advantages include:

- Providing continuity and coordination of care by communicating through multiple disciplines, levels of care and services.
- Educating staff and physicians regarding evidence-based care and promoting improved practice through comprehensive care.
- Improving patient safety through formatting and consistent style in a concise and clear presentation.

- Enhancing work flow and process through easy to read orders with specific and standardized instructions that are pertinent, simple to locate and use and that directly apply to current information management systems.
- Providing safety alerts and reminders to reduce the probability of medication errors.
- Reminding, referring and utilizing outpatient and continuing services post discharge as appropriate.
- Preventing potential billing issues – for example, by clearly indicating inpatient, outpatient and observation status.

Pre-printed orders also have the advantage of being ready to use for commonly performed interventions in the hospital. Furthermore, by incorporating measures into the process, pre-printed physician orders have the potential to improve the quality of care by making available pertinent safety alerts and best practice indicators to physicians and licensed caregivers at the time of use.

The Elements of Orders

There are four areas to consider when creating or reviewing pre-printed physician orders:

Content – This ensures the content is comprehensive, coordinated and inclusive which may involve orders beyond what the physician may initially consider – such as DVT prevention measures, medication warnings, smoking cessation advice, indications of Performance Measures or appropriate antibiotics listed on the back of the order sheet for physician reference.

Readability – Making the type and layout simple to read includes consideration to font, point size, white space, use of symbols, capitalizations and adequate space for handwritten entries.

Style – Standardizing usage, punctuation, arrangement, design, naming convention, etc., defines and presents a consistent format for the orders.

Safety – Presenting information or instructions in such a manner to clearly and consistently convey intent is very important for all physician orders. This is especially true as it pertains to medications. The institute for Safe Medication Practices (ISMP), Food and Drug Administration (FDA) and others offer advice on how to write orders pertaining to medications. Some of this information is included.

Content

Generally orders start with content, meaning that the physician writes or creates orders for a specific procedure or diagnosis, care or admission. Examples of content criteria include:

Criteria	Examples or clarification
1. Are the orders comprehensive?	Do the orders include all likely needs including other services, other disciplines and discharge planning as appropriate?
2. To reduce the possibility of being overlooked, are automatic orders pre-checked?	Do the orders include the statement "Strike through entire line to cancel a pre-checked order."
3. Are performance measures (including Core measures),	For example – "Screen and administer Pneumococcal vaccine as appropriate

indicated?	prior to discharge. *(Performance Measure)"*
4. Is the content approved by the physician?	Final physician approval is required after the orders have been modified.
5. Are the medications and equipment listed available at your facility?	Check medications against the formulary. Make sure Materials Management or Bio Engineering is able to support equipment items.

Content also includes warnings and alerts as appropriate to the patient's condition or to the medications or treatments being ordered. Examples of these may include (Medication Errors, 2007):

1. Hold Heparin and Lovenox while the patient is receiving epidural treatment.
2. Allergy Alert! These orders contain aspirin, NSAIDS, antibiotic, narcotic, sulfonamides or MAO medications.
3. Do NOT mix glargine (Lantus) with other Insulins.
4. Administer Pneumococcal and Influenza vaccines in separate arms.
5. Maximum total dose of acetaminophen not to exceed 4,000 mg per 24 hours.
6. Do not give narcotics until epidural is discontinued.
7. Stop antibiotics 24 hours after end of surgery. *(Performance Measure)*
8. Enoxaparin (Lovenox) is a relative contraindication 24 hours prior to potential surgery or invasive procedure.
9. Clopidogrel **(**Plavix)_____mg by mouth x 1 dose. (Hold if going to Cath Lab or CABG within 5 days).

10. *Performance Measure – Either an ACEI or ARB is prescribed at discharge unless there is a written contraindication / reason for not prescribing EACH.

Content can also include reminders for optional referrals such as:

☐ Outpatient Diabetes Education post discharge. Fax this sheet to 676 -1234.

☐ Cardiac Wellness / Rehab post discharge. Fax this sheet to 676 - 4321.

Readability

Given the aging population of many healthcare providers, it is more important than ever to make the printed word easy to read. There are several ways to accomplish this. For example:

Criteria	Examples or clarification
1. Do the orders contain look-alike or sound-alike items?	BNP versus BMP. Write out – BN Peptide and Basic Metabolic Panel.
2. Is the print simple to read?	Non-serif font, such as Arial 12 point is recommended.
3. Are instructions unambiguous?	Can it be easily misinterpreted?
4. Is the use of symbols kept to a minimum? Be aware of letters and numbers that are easy to misinterpret.	Do not use < or >. (Write “less than” or “more than”). Slashes (/) have been misread as the number one. (Provide a space before and after a slash if used. For example – “20 mg / 500 mL” or write “per” in place of the slash.). Also, the letter “O” can be misread as the number zero. Lower case L

	(l) has been misread as the number 1 or the capital letter i (I). (It's time for standards, 2003). Sometimes, it lessens confusion to write "one" and "zero".
5. Is tall man lettering used for look-alike names?	A listing of look-alike medication names is on: **www.fda.gov/cder/drug/MedErrors/nameDiff.htm** (Looks like a problem, 2003. It's time for standards, 2003). Tallman lettering can also apply to words such as "eAr" and "eYe".
6. If salts are used as part of the medication names, does it follow the drug name?	Write "warfarin Na" – and NOT "Na warfarin" which can be read as "No warfarin." Better yet – don't use the salt as part of the medication name unless necessary. (It's time for standards, 2003).
7. Do the orders use commas for dosage numbers expressed in thousands?	Write "5,000" – NOT "5000". (It's time for standards, 2003).
8. Use the word "thousand" and "million" for large doses.	Use "1 million" units and "150 thousand" rather than zeros.
9. Place a space between the name of the medication and the	For example: Write "propanolol 20 mg" – NOT "propanolol20mg". (It's time for standards, 2003) which can be misread as 120 mg.

dosage or unit of measure.	
10. Do the orders include a space for physician ID # next to the signature line?	This helps with identification of the physician. _____ _____ Physician signature ID# Date
11. Is PRN, if used, in all capital letters?	PRN is easily read as “pm” when lower case letters are used. Likewise, KCL has been read as KCI when all caps are not used.

Style

Style sets the “art” standard for the way the orders look and feel. This includes the order in which information is presented on the order sheet. This is also a method that can be used to get your staff ready for the organization of orders in an upcoming Computerized Physician Order Entry (CPOE) implementation. For example, orders may be consistently grouped under headers such as:

Order Group	Examples
Admission status	Inpatient, Outpatient, Observation status, Full code, No code, Comfort care.
Nursing orders	Wound care, Foley catheter, activity orders, etc.
Dietary	Diet orders, tube feedings, NPO.
IV fluid	Type, rate, amount.
Medications	By mouth, IV, IM, Topical, Scheduled, PRN, etc.

Cardiopulmonary	Echocardiograms, Respiratory Treatment, Smoking Cessation Education.
Laboratory	Blood work orders.
Radiology / Imaging	CT, MRI, Chest X-ray.
Therapy	Physical, Speech
Consults	Other physicians, case management, wound care nurse.

Additionally, orders are named (or titled) in a way to simplify finding orders from the print shop. For example – An order from a specific physician may be named: Dr Smith Pre Op Pacemaker Orders 0107. This indicates the physician, type of order (pre op, post op, admission, discharge) procedure or diagnosis, and date last approved.

Style also includes consistency and expressing weights and measures. For example the United States Pharmacopeia (USP) standard abbreviations for dosage units include the following (It's time for standards, 2003):

Abbreviation	
m	meters
kg	kilogram
g	gram
mg	milligram
mcg	microgram

Abbreviation	
L	Liter
mL	milliter (do not use "cc")
mEq	Milliequivalent
mmol	Millimole

Style also takes into consideration the verbiage to assist unit secretaries in putting orders into hospital specific information systems. For example – an order to request smoking cessation education for a patient, may read as:

☼ RT for Smoke Cessation if patient has smoked within the past 12 months. *(Performance Measure)*

Additionally, to avoid a potential conflict, patient allergies are listed only on page one of multi-page orders.

Safety

None of the four topics (Content, Readability, Style or Safety) are mutually exclusive, and each can be argued to have some degree of safety within them. Below are listed the more common concerns regarding orders and medication safety to consider:

Criteria	Examples or clarification
1. Do the orders limit abbreviations to a minimum and never use unapproved abbreviations (such as QD or U)?	This includes not using trailing zeros, but always including leading zeros. (Medication Errors, 2007).
2. Do not number medication orders.	The number can get confused with the dose of the medication.
3. Are all medications listed together under a title of “Medications”?	This makes it easier to take these orders off and lessens possibility of over looking a medication order. It also helps pharmacy in completing

	the Medication Administration Record. (Remember to include "Saline Flush every 8 hours and PRN to maintain patency" under Medications when there is an order for a Saline Lock.)
4. Do not allow blanket or multiple range (1-2 tablets every 3-4 hours) orders.	For example – "Continue previous medications" is never allowed.
5. Do the orders always include indications for PRN medications?	This helps to verify the correct medication, dose and indication. (It's time for standards, 2003).
6. Do the orders contain acetaminophen (Compazine, Toradol and others) total dose warning?	Many medications contain acetaminophen. Place a warning - "Maximum total dose of acetaminophen not to exceed 4,000 mg per 24 hours" (for adults) on all orders with any medication(s) containing acetaminophen.
7. Do orders contain allergy warning above physician signature line as appropriate – "Allergy Alert! These orders contain (aspirin, NSAIDS,	This is a reminder for physicians to check allergies again prior to signing the orders.

antibiotic, narcotic, sulfonamides or MAO) medications"?	
8. Do Medication orders include drug name, strength, dose, route, and frequency? (It's time for standards, 2003).	For example – Bumetanide (Bumex) 1 mg. Take 2 tablets by mouth once daily.
9. Are generic and trade name, if applicable, used?	List generic name first followed by brand name in parentheses– Furosemide (Lasix). (It's time for standards, 2003).
10. Do medication orders contain criteria to determine which route is to be used if multiple routes are listed?	For example – Give IV until patient is able to tolerate liquids by mouth.
11. Are medication doses written in milligrams (mg) when possible and not just in tablets or mL?	For example – Write - Acetaminophen (Tylenol) <u>500 mg.</u> Take one tablet by mouth every 6 hours as needed for mild pain.
12. Is a timeframe included for IV bolus and IV push medications?	For example – Diazepam (Valium) 5 mg / mL. Give 5 mg IVP, <u>over at least one minute,</u> every 4 hours as needed for muscle spasm.
13. Do the orders refer to all medications as appropriate?	Do the orders "Refer to Medication Reconciliation Sheet" appropriately?

14. Do the scheduled times for medication administration promote patient safety?	The schedule (and stacking) of medications can contribute to falls in the elderly. Something as simple as changing scheduled medication times for every 12 hour diuretic medications from 9 am and 9 pm to 6 am and 6 pm can decrease nighttime falls among patients trying to get to the restroom.

Conclusion

Writing good pre-printed physician orders is truly both an art and a science. When well designed, these orders integrate pertinent reminders, safety measures and best practice into a “just in time process” when it is needed and as it is happening. As such, pre-printed orders have the ability to positively impact good practice and promote patient safety through clearly written communication. Through multi-disciplinary involvement, pre-printed physician orders have the opportunity to intensely focus an array of disciplinary perspectives onto the care of a single patient.

To do this well, good orders require input from diverse disciplines. Our Clinical Best Practice Committee meets monthly and depending upon the orders being created or reviewed, attendance may be requested from any clinical area of the hospital including: Pharmacy, Case Management, various physicians, Emergency Medicine, Nursing, Dietary, Admissions, Birthcare, Unit Secretary, Radiology, Laboratory, Stroke Coordinator, Rehabilitation, etc.

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