

# PRHI Executive Summary

Purchasing community examines medication error

## Clarity: the 25% solution

According to the Institute for Safe Medication Practices (ISMP), 25% of prescriptions are difficult to decipher. What if a quarter of prescription errors could be eliminated by improving legibility and providing complete, unambiguous orders? Employers who purchase health care considered the question at a recent meeting convened by PRHI.

Healthcare purchasers from Giant Eagle, Demegen, H. J. Heinz, Mellon, Pittsburgh Business Group on Health and SMC Business Councils met with PRHI CEO Paul O’Neill to discuss ways that they could help advance regional improvement quickly. While the cost of healthcare is among employers’ top concerns nationwide, the increasing involvement of PRHI employer partners mainly reflects their deeper desire to prevent harm to the people who work for them.

The employers discovered that hospital pharmacies are still plagued with illegible and

incomplete prescriptions. And where well designed and executed computerized physician order entry programs (CPOE), such as at the VA and Children’s Hospital, will largely eliminate basic legibility problems, such systems are expensive and may introduce other problems. Must the region wait for CPOE to address the 25% or errors caused by illegibility? The employers considered these examples:

- 1) In an experiment in one local hospital, every order entering the pharmacy was examined and depending on the shift, from *Continued, page 4*



May 2004

Hand written orders

## Ambiguity exacts toll on patient, worker

Jane Brown<sup>1</sup>, a pharmacist at a local hospital, was nearing the end of her shift, and she was running behind. When she graduated from pharmacy school three years ago, this hospital was her first choice, and she hasn’t regretted it. But she always feels busy, always feels behind.

This was a typical shift, and Jane discovered that about 25% of the orders crossing her desk were either illegible or incomplete, and required clarification. She had resolved several orders during her shift, calling the physicians or the nurses who had sent them down.

As it turned out, Jane had read one of the difficult-to-read orders correctly, and had correctly realized that it would interact with another drug the patient was taking. The physician thanked her, changed the order, and Jane noted the discrepancy on a sheet for later entry into the computerized tracking system.

Another order she wasn’t so sure about. She thought she knew which drug the physician meant to prescribe, but an upstroke in the writing confused her. She wasn’t about to guess. To be on the safe side, Jane called the physician, who gave the correct drug name (*not* the one she would have guessed). The physician was a little irritated to have been called. His waiting room was full of patients; he thought Jane should have easily been able to read his handwriting; and he told her so. Jane’s hospital doesn’t log ambiguous orders as errors, but Jane keeps track of them herself.

Now, very near the end of her shift, three hand written orders lay on Jane’s console that she just couldn’t decipher. At the end of this shift, she had volunteered to work a second shift down in the pediatric pharmacy. Now Jane was in a double-bind. She just couldn’t be late to pediatrics. But she just couldn’t leave these orders unresolved, either.

*Continued, page 6*



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Example from aviation

## The price of rushing

Norm Komich, a senior airline captain, is an experienced instructor in Crew Resource Management (CRM). CRM is a training program at most airlines worldwide based on the recognition that human factors underlie most aviation errors. Like

surgery, an airline flight is a complex system of interdependencies among flight and cabin crew, air traffic control (ATC), flight operations, ground staff and flight planning personnel.

The most common reason physicians give for writing illegible or incomplete orders or using unapproved abbreviations is haste. Studies from England show that physicians' handwriting is no more or less legible than anyone writing in a big hurry.

"I have no time. Make my schedule and my day manageable," said one

physician, "and then I'll be able to take the time I need to write better."

### **An aviation parallel?**

Captain Komich recently posted this missive on rushing to an aviation safety discussion page:

*Two of the common threads in aviation accidents are distractions and being rushed. I would like to comment on the latter. We fly for a variety of reasons, but one that stands out is that it is a faster way of transportation. [Yet speed] can actually contribute to an accident... When we rush we can miss or overlook seemingly simple but crucial items.*

*The dilemma is being aware that we are actually rushing.*

*Without question, the folks at ATC can often put us in a situation where we have to rush. Last minute runway changes, delayed descents, expedited departures, etc. can all force us to hurry up and, in so doing, make an error.*

### **Real example of an insidious problem**

Captain Komich gives a real-world example where rushing might have seemed necessary. Was it?

*Once as I approached the active [runway] after a short taxi from the blocks, tower cleared me into position and hold [line up for takeoff]. I replied that I needed a minute to complete checklists and I would call them when I was ready. Tower replied that I could take my delay on the active [runway], to taxi into position and hold and call when ready. I did this and so help me goodness, 30 seconds later while half way through my checklists, Tower called and asked: 'Are you ready yet? There's an aircraft [preparing to land on] your runway.'*

*So even though I tried to avoid rushing, I either had to rush, or force my fellow aviator to go around. [In addition to the adrenaline, go-arounds require pilots to file paperwork afterward to explain the reasons.]*

In the end, despite powerful motivation to rush the routine checklist, Komich did not take off; the other aircraft did a go-around; and paperwork reflected the misunderstanding with ATC.

### **Rushing in health care**

When the nurses at the VAPHS complained that they couldn't comply with hand hygiene requirements because they didn't have enough time,

their team leader took it seriously. The team set about streamlining systems, making supplies readily available, making work less hard, in a successful attempt to "create" more time. It was important to learn why the nurses were so rushed. Again, the systems were to blame, and fixing them freed up necessary time.

Rushing is dangerous, especially when lives are at stake, as they are in the fuselage of an airplane or at the tip of a physician's pen. Managing the "busy-ness" often involves looking at how to streamline systems to free up more time. It also involves continuously realizing that a task as mundane as writing out a prescription—like the mundane task of reading the same checklist before every single takeoff—can be a matter of life and death. *✍*

**The dilemma is being aware that we are actually rushing.**

—Norm Komich  
Airline captain,  
CRM instructor



Business partners offer assistance**Insurers examine legibility**

**I**n addition to our own local employer/purchasers, insurance companies and businesses across the country are becoming more aware of the waste and harm that arise from illegible medical orders. One company, the Medical Mutual Insurance Company of Maine, publishes handwriting guidelines for medical personnel on its website.

**What contributes to poor penmanship?**

- ✧ An environment where distractions are high
- ✧ An uneven or inadequate writing surface
- ✧ A poorly designed writing instrument, (felt-tipped pen)
- ✧ Incorrect posture when writing
- ✧ Inadequate equipment - wrong height chair, desks too high or low, counter too high or low.
- ✧ Lack of enough room to write
- ✧ Cursive writing as opposed to printing.
- ✧ Interruptions
- ✧ Poor time management (hurrying)
- ✧ Forms with inadequate space to write legibly
- ✧ Bad habits which can include penmanship style

**What can be done to enhance good penmanship?**

- ✧ Have an ergonomic expert look at the areas where orders are written.
- ✧ Have a designated space that includes chairs that can be adjusted, even writing surfaces etc
- ✧ Have the designated space be located in an area away from the main traffic on the hospital unit or in the practice
- ✧ If possible the designated area should have a door that can be closed to prevent distractions
- ✧ Plan your schedule allowing for

adequate time to complete documentation in a legible fashion

- ✧ Print words instead of writing them in cursive
- ✧ Reread your own writing to evaluate if it is clear and legible

**What can be done to prevent a handwritten order from being misread or illegibility from continuing to be an issue?**

- ✧ Ask a staff member to check and clarify the orders before you leave the unit or go into see your next patient
- ✧ Assure that the patient is aware when possible of what is being ordered
- ✧ If an order is clarified by the nursing staff or pharmacist assure that it is rewritten legibly and transcribed properly

- ✧ If legibility continues to be an issue in your practice or hospital follow the chain of command or direct the ongoing issue to a specified committee i.e. medical record committee
- ✧ Consider the use of technology for implementing computer generated orders
- ✧ For progress notes, consider the use of dictation

**What can be done to increase the awareness of the issue?**

- ✧ Discuss with your partners or

medical staff leaders the issues related to poor penmanship so that there is "buy in" regarding the issue

- ✧ Collect statistics i.e. # of times a call is made for clarification due to illegibility, significance of potential error
- ✧ Communicate the statistics and analysis to the physicians
- ✧ Copy illegible orders (eliminating patient identification) and use as a teaching tool at a medical staff or physician office practice meeting
- ✧ Reward compliance

**What else can be done?**

- ✧ Make legible handwriting mandatory
- ✧ Call your local high schools or college and ask if they offer a handwriting class.
- ✧ Hold your own class: Department stores sell penmanship books that can assist in changing habits that contribute to illegibility.

**References:**

Medical Records Briefing: Reading Between the Lines: Improving Legibility To Reduce Medical Errors, Opus Communications 2001

Healthcare Risk Management- Poor Handwriting On Scrip Brings Negligence Ruling. January 2000



From Page One**Legibility: the 25% solution**

16% to 26% of medication orders were difficult to read or were not complete. (Pharmacists did not seek clarification on all of these orders).

- 2) At another local institution, over a 3-1/2 week pilot period, pharmacists decided to intervene in 191 orders. Illegibility and incompleteness caused 25% of the interventions.

3) Pharmacists and other healthcare workers do not seek clarification of every illegible or incomplete order because they fear backlash from the prescriber. On this last point, the purchasers learned that problem orders are exacerbated by systemic cultural problems including fear of reprimand if they question an order. One news report says:

*Physicians who intimidate or berate caregivers are contributing to medication errors by reducing the likelihood that nurses, pharmacists and other healthcare professionals will act on concerns about orders, according to a survey of 2,099 healthcare professionals by the Institute for Safe Medication Practices.*

*At least once in the past year, 40% of respondents with concerns about the safety of a medication assumed the prescription was correct rather than bring the matter up with a physician or other prescribing clinician with a reputation for reacting with intimidation.*

*And when they did express concerns, 49% said they felt pressured to dispense or administer the medication*

*regardless.*

*Often, the memory of past confrontations was threat enough -- nearly half of respondents said past experiences with intimidation have altered how they handle questions or clarifications.*

*The consequences: 7% of respondents said they were involved in a medication error "in which intimidation clearly played a role," according to the institute.*

The employers (and healthcare purchasers) had a dynamic discussion about what their role could be in helping to transform healthcare in the Pittsburgh region.

- ✧ If they saw a chance in their own organizations to reduce one kind of error by 25% all at once, what would they do?
- ✧ If, in their own organizations, they discovered that fear of reprimand could prevent workers from exerting their best judgment, or doing what was in the best interest of clients, how would they handle it?
- ✧ Could they help by sharing their knowledge with hospital leaders?

The employers agreed that a practical and relatively simple first step would be for them to send letters to the hospital CEOs. These letters will discuss the incontestable goal of addressing the legibility and completeness of medical orders, offer support and invite dialogue. Some employers may ask to visit the hospitals by summer's end, in an effort to understand the process and progress. ✧

For further information about PRHI's Buying Healthcare Value Committee, contact Diane Frndak, 412-535-0292, ext. 111.

**FYI: from Modern Healthcare****JCAHO plan would require bar codes at bedside**

[Reprinted with permission from Modern Healthcare's Daily Dose, April 19, 2004. Author, John Morrissey.]

Hospitals would have to develop a plan for implementing bar code technology at the bedside, to be operational by January 2007, as part of significantly revised patient safety goals proposed by the Joint Commission on Accreditation of Healthcare Organizations. Under a "potential" expansion of the JCAHO goals, which hospitals must meet as part of the accreditation process, adopting bar code readers would become part of an overall goal of improving patient identification. The Food and Drug Administration published regulations in February requiring drug manufacturers to add bar codes to single units of medication by April 2006, but the rules do not require hospital participation. The JCAHO proposal also would establish three new patient safety goals ~ reconciling medications during patient transfers, reducing the risk of patient harm from falls and reducing the risk of surgical fires. In addition, it would add significant new requirements to the existing seven goals, including independent double-checks whenever infusion pumps are programmed. Hospitals can comment on the proposals through April 30. ✧

# Protecting Patients in Complex Systems

Draft agenda

WEDNESDAY, JUNE 2, 2004 • CARNEGIE MELLON UNIVERSITY  
 UNIVERSITY CENTER, 4<sup>TH</sup> AVENUE • 8 AM — 6 PM

8:00- 8:30	Registration		
8:30- 9:30	Introductions, Opening Plenary <b>Keynote Address: Former U. S. Treasury Secretary Paul H. O'Neill</b>		
Tracks are keyed by tone →	<b>Track 1:</b> <i>General Patient Safety Information</i>	<b>Track 2:</b> <i>Practical Patient Safety Tips (Inpatient Practice)</i>	<b>Track 3:</b> <i>Perfecting Patient Care</i>
9:45- noon	Information Technology: Patient Safety and Cost	Idealized Office Design	PPC Introductory Session Dr. Jon Lloyd Diane Frndak
	IOM Report Recommendations	Use of Computers and Technology in the Physician Practice	
		Prescribing and Medication Error Avoidance in the Outpatient Setting	
		Barriers to Implementation	
Noon –1:15	Lunch		
1:15 –1:45	Afternoon Plenary <b>PSA representative: Operation of the Patient Safety Authority</b>		
2:00-4:15	AHRQ PSI Dr. Smullens	Infections in Hospitalized Patients Dr. Shannon	PPC Introductory Session Dr. Jon Lloyd Diane Frndak  (repeat of morning session)
	A New Theory of Risk/Error Analysis	Preparing Your Patient for Surgery	
	State Governmental Initiatives Jeff Greenawalt	Medication Prescribing and Ordering in the Inpatient Setting	
4:30- 6:00-	PATIENT SAFETY SMALL GROUP DISCUSSION ROUNDTABLES- Topics to be identified by faculty at each table, which will be communicated to the audience. Participants will be encouraged to rotate among tables participating in the conversations as they wish. Table Hosts: Daniel Glunk, MD, Ralph Schmeltz, MD, Jeff Greenawalt, Carol Rose, MD, Amir Jaffer, MD		

## For further information

Clinicians who would like to attend “Protecting Patients in Complex Systems” or present a table talk or poster, please contact Jeff Greenawalt at the Pennsylvania Medical Society, [JGreenawalt@pamedsoc.org](mailto:JGreenawalt@pamedsoc.org)

From Page One**Ambiguity exacts human toll**

One particularly puzzling order left her nowhere to turn. A couple of the “five rights” were missing. (The “five rights” are: right patient, right time, right dose, right route [IV, oral] and right frequency.) Although Jane couldn’t decipher the patient’s name or the frequency, that wasn’t the biggest problem. There was actually a sixth “right” that

was missing: right doctor. The physician’s name was obscured on the order, the signature that of a busy executive—a loop and a straight line. Which physician? Which patient? Jane didn’t even know whom to call.

Time was up. This shift was over. She was needed in the busy pediatric pharmacy immediately. Her colleague, pharmacist Harold Jackson, was ready to begin his shift. Jane had no choice but to export the three remaining “issues” to Harold, who was none too pleased to be starting his shift buried under leftover problems. He would be

behind his entire shift.

And three patients still hadn’t received their medication...

**What is an illegible order?**

Diane Cousins, Vice President, Practitioner and Product Experience for US Pharmacopoeia (USP), defines it this way:

An illegible order is itself an ambiguous thing. You may be able to read my handwriting but someone else may not. We believe that if an order is not fully legible to the health professional working with it, it is an error. [USP] would consider it a Category B error if the pharmacist called the physician because she was not really

certain what it said.

Some say, “Well if the pharmacist can’t read it, he should call the physician.” But sometimes the pharmacist will think it is in fact readable. This phenomenon is called *confirmation bias*, where you see what you know or are familiar with. As an example, a pharmacist may read a handwritten prescription and think with certainty that the order is clear. It’s what he dispenses all the time. In fact it may be an order for a drug new to the market. The pharmacist is not aware of that drug, so when he reads the handwritten order he sees the drug name that he is most familiar with.

USP does not make recommendations on handwriting legibility but there is a set of recommendations by the NCC MERP that may be helpful. Because some would say reading an Rx is too subjective, USP’s standard for the readability of an order is that it be *unambiguous enough to be read 100% of the time*.

**Danger of routine**

Besides confirmation bias, the danger of routine is always present. Some describe the problem this way:

While most people associate medical errors with untrained, inexperienced or incompetent caregivers, most of our errors are made by well trained, experienced and competent caregivers who perform their tasks so well that they have become almost second nature. Doctors and nurses are most likely to slip doing something they have done correctly a thousand times—asking patients if they are allergic to any medications before writing a prescription, for example, or remembering to verify a patient’s identity. . . The big implication of this is that some of the most routine health care tasks paradoxically carry the biggest risk to patients.<sup>2</sup>

**Danger of drug names**

There’s another landmine in the prescribing world: many popular medications have remarkably similar names. The antidepressant Zyprexa and the antihistamine Zyrtec; the anticonvulsant Cerebys and the anti-inflammatory Celebrex; and the mood stabilizer Lamictal and the antifungal Lamisil are but three of many examples where even good penmanship is no substitute for an alert and functioning brain in those who write and those who fill prescriptions. Only recently has the FDA pushed manufacturers to avoid sound-alike names. The pharmaceutical giant Eli Lilly, for one, was compelled to change the name of a new drug for attention-deficit disorder from *tomoxetine* to *atomoxetine* because the former resembled the anticancer drug, *tamoxifen*, to a dangerous degree.<sup>3</sup>

**The five “rights” of prescribing:**

- ❖ **Right patient**
- ❖ **Right time**
- ❖ **Right dose**
- ❖ **Right route**
- ❖ **Right frequency**

**Legibility Tools Available**

The Pennsylvania-based Institute for Safe Medication Practices offers initiatives to help reduce medication errors caused by communication glitches such as: alerts on look-alike or sound-alike drugs, and preprinted prescription pads that include icons representing body systems to help doctors communicate the purpose of their order. <http://www.ismp.org>

You can also find the latest ISMP look-alike, sound-alike alert at <http://www.prhi.org> under **Publications, Regional Alerts**.

Check out the recommendations on handwriting and legibility at the NCC MERP website: <http://www.nccmerp.org/council/council1996-09-04.html>

It's important to have everyone "at the table" when discussing problems that affect entire systems, including pharmaceutical suppliers. The problem is never singular—illegible orders—but a compilation of problems from many sources. Finding and fixing root causes requires cooperation and creative problem-solving from every entity touching the system.

### **Is CPOE the answer?**

Articles by NCC MERP, ISMP and others tout computerized physician order entry (CPOE) as the cure for ambiguous prescribing orders. While CPOE is not a universal remedy, it can help. The VA estimates that CPOE has eliminated 55% of medication errors, including legibility problems. (Only 5% of orders are allowed to be hand written at the VA, for esoteric medications, for example.) Children's Hospital, which instituted CPOE in 2003, has also realized impressive gains in legibility and error reduction; however, like many other hospitals, Children's is discovering that the CPOE system itself can introduce other kinds of error. And anyone who has ever endured a computer malfunction knows that automated systems are not 100% reliable.

Most important, sophisticated computer systems do not address the day-to-day, person-to-person interactions required for a flawless healthcare delivery system.

### **Local hospitals go after the problem**

At more than one area hospital, CEOs have stepped forward and stated that illegible or incomplete orders will not be filled. The standard is that the most junior pharmacist ought to be able to read the order. These rules have reduced resistance of physicians to being called for clarification, and have resulted in fewer problem orders. However, the burden of problem-solving still rests with the pharmacists.

UPMC Northwest recently documented that it takes the equivalent of 2.5 full-time employees to clarify all of the ambiguous orders. More important, calls for clarification delay the medication from getting to the patient on time. Some have observed that, with automatic pharmacist call-backs, physicians come to view these interruptions as part of their work, not as a problem.

Addressing problems like these requires a blame-free, multidisciplinary approach, and begins with these basic questions: "Why CAN'T orders always be clear and unambiguous? What are the barriers to perfect

prescription clarity?"

At UPMC Northwest, a recent patient order of 12 individual medications contained five that were incomplete or illegible. In an effort to resolve the problem immediately and prevent its recurrence, the ordering physician, pharmacy manager, and CEO met to understand why it occurred.

<b>DO NOT USE</b>	<b>ALTERNATIVE</b>	<b>ELEMENTS OF A SAFE MEDICATION ORDER</b>
U	Unit	
IU	International Unit	✧ PATIENT NAME
Trailing zero after decimal point		✧ MEDICATION NAME
No leading zero before decimal point		✧ STRENGTH
MS, MS04, MgS04	Morphine or magnesium	✧ DOSAGE UNIT (MG, UNIT, ETC)
µg	mcg or micrograms	✧ FREQUENCY
Q.D.	Daily	✧ ROUTE
Q.O.D.	Every other day	✧ IV MED START TIME
O.S.	Left eye	
O. D.	Right eye	
O.U.	Both eyes	

As a result, the physician agreed to block print future orders and to use a pocket card (above) to identify the most commonly used dangerous abbreviations, recommended alternatives, and the critical elements of a safe medication order. The physician also agreed to facilitate a meeting with his peers to further highlight legibility problems and elicit their help in resolving them.

Said CEO Neil Todhunter of the work, "I'm impressed with the understanding around illegibility, the willingness to experiment and change processes for patient safety improvement."

As legibility experiments like these undergo various refinements, more problems will be exposed, creating the opportunity to solve them. But sometimes low-tech responses, like the pocket card, and like a pilot's checklist, can help break through the danger of routine. *✍*



<sup>1</sup> Names changed; situations composite. Illustrative story only.

<sup>2</sup> <http://www.nccmerp.org/council/council1996-09-04.html>

<sup>3</sup> *Internal Bleeding*, Robert Wachter, MD, and Kaveh Shojania, MD (ISBN 1590710169), p. 83

<sup>4</sup> *Ibid*, p. 66

## Calendar, June 2004

Tuesday, June 1 PCC 101, Centre City Tower, 5th floor\*  
8a-5p  
Information Session, 5th floor\*  
6-9p

Wednesday, June 2 Go and See, Allegheny General Hospital\*  
8a-noon

***Protecting Patients in Complex Systems***  
University Center, Carnegie Mellon University  
8a-6p

Monday, June 7 Chronic Care Working Group, Centre City Tower  
Conference Center, 5<sup>th</sup> floor – Montour Room 5-7 pm

Tuesday, June 8 Obstetrical Working Group, PRHI Offices  
5:30–7p

Monday, June 14-Friday, June 18 PCC University\*  
8a-5p  
Contact Patience Celeder for further information

Tuesday, June 15 *Oh! No!* Session (location tbd)\*  
8a-noon

Wednesday, June 23 ***Spring 2004 Cardiac Forum***  
5:50-8 pm  
Allegheny General Hospital, Magovern Conference Ctr

\*CEUs and/or CMEs offered. For further information or to enroll, call Patience Celeder, 412-535-0292, ext. 100

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PRHI Executive Summary is also posted  
monthly at [www.prhi.org](http://www.prhi.org)

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### Pittsburgh Regional Healthcare Initiative

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#### Two June Conferences

- ✧ Protecting Patients in  
Complex Systems, 6-2
- ✧ Spring Cardiac Forum, 6-23  
(schedule on reverse flap)

PRHI is a consortium of those who provide, purchase, insure and support health care delivery in Southwestern Pennsylvania.  
Together, we are working to achieve:

- ✧ Zero hospital-acquired infections.
- ✧ Zero medication errors.
- ✧ The world's best patient outcomes in: cardiac surgery; obstetrics; diabetes and depression.