Pittsburgh Regional Healthcare Initiative

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Legibility and medication errors

Can Pittsburgh end "prescription roulette?"

The story of Ramon Vasquez, a 42-year-old heart patient, vividly demonstrates the problem inherent with illegible handwriting on prescriptions. This story is reprinted with permission from ***Internal Bleeding***, by Robert Wachter, MD, and Kaveh Shojania, MD, physicians at the University of California, San Francisco Medical Center. Although this

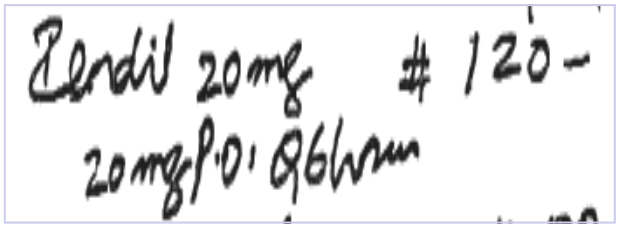
After an episode of angina, Vasquez leaves the doctor's office *with a prescription for a new heart medicine. But what was this prescription for? Why don't you try your hand at 'prescription roulette': Look closely at Vasquez' actual prescription, reproduced here, and decide for yourself if the doctor is prescribing Plendil (a powerful calcium-channel blocking drug sometimes used to treat angina) or Isordil (a longer lasting version of the tiny nitroglycerin tablets heart patients slip under their tongues for temporary relief from angina.)*

If you had trouble deciding, welcome to the club. We asked 158 physician colleagues to interpret this prescription. Half thought it was for Plendil; about a third voted for Isordil. And the rest thought it was for a third drug, Zestril, a medication for high blood pressure. Even knowing Vasquez's diagnosis wouldn't be much help, since all three are used to treat heart patients.

Ramon Vasquez's doctor actually intended to prescribe 120 tablets of Isordil, at its typical dose of 20 milligrams (mg) by mouth (po) every (Q) six hours. Tragically, like the majority of our colleagues, Vasquez's local pharmacist also 'flunked' this test, sending him home with a bottle of Plendil. The instructions told him to take 20 mg at breakfast, lunch, dinner and bedtime—a total of 80 mg a day.

Even more tragically, the usual and safe dose of Plendil is 10 mg a day."

The story goes on to recount the death of Ramon Vasquez from a massive overdose of Plendil and his widow's subsequent malpractice award of $450,000—the full amount she'd asked for.



*One juror later said that if Mrs. Vasquez had asked for a bigger award, they would have gladly granted it. After the trial, Mrs. Vasquez explained that she had taken legal action less for the money than 'because if the doctors don't change their writing, then it could happen again with my kids, or even me.**

Waiting for Godot?

Computerized physician order entry (CPOE), when instituted, will surely cut these kinds of interpretation errors, even as they potentially introduce a new set of "glitches." The case for CPOE at Children's Hospital was compelling.

In a report for the Commonwealth Fund, Artemis March writes, "Children's small size makes them unforgiving of prescription errors that can be tolerated by adults... In diagnosing drugs for children, [pediatricians] often have to perform calculations and work with fractional amounts, leaving room for error."

Mandated from the highest levels of hospital administration and Board, no staff member would be allowed to opt out of CPOE. Safety for children was the central, indisputable message reiterated from leadership.

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"It wasn't about convenience. It wasn't about saving money," said Jocelyn Benes, Executive Director of Quality and Care Management. "It was only about safety for the children who are our patients."

Since the roll-out of CPOE at Children's Hospital in October 2002, handwritten orders and transcription errors have ceased. Trainers were on hand 24 hours a day to make sure everyone on staff knew how to use the system. Reluctance was overcome in several ways:

> ***"If the doctors don't change their writing, then it could happen again with my kids, or even me."***
>
> *Widow of Ramon Vasquez*
> *From* ***Internal Bleeding***

✧Continuous communication of the administration's unwavering commitment to keeping children safe;

✧The commitment to face problems frankly during implementation;

Dramatic advantages quickly became apparent.

✧Delivery time has been halved.

✧Children's continues to make medication error reporting easy for staff, offering a 24-hour anonymous hotline and staff availability. But since CPOE was introduced, medication error reporting has increased by a third.

✧Medication errors involving harm to the patient have decreased by 50%.

Physicians continue to be impressed by the power of the CPOE clinical decision support capabilities. More are becoming "super-users," acquainted with program capabilities that allows physicians to monitor current lab results, blood pressure, temperature, weight—everything about the patient, right at the bedside. The program also includes a weight-based dosing calculator, extremely important for children. The computer prompts with questions about weight, dose, allergies, interactions and the like.

"It's not a cookbook that tells you what to do," said Eugene Wiener, M.D., Medical Director. "Instead it asks you to consider: 'Did you know this? Did you think about that?' The nurse gets same messages. It allows people to stop and think."

Training continues. With such a powerful program, learning takes place in layers, with professional trainers and "super-users" showing others. With every upgrade comes a new round of training. An informal newsletter shares the snags, along with handy tricks.

The Heritage Valley System has also been preparing its staff for the introduction of CPOE. Like most hospitals now implementing this program, Heritage Valley knows that CPOE is no panacea. Leadership is still required to address the necessary behavioral changes. Nevertheless, those who have successfully implemented CPOE believe that the benefits do outweigh the risks.

Wachter and Shojania cite other successful roll-outs of CPOE: at Brigham and Women's Hospital in Boston, it "keeps track of a patient's kidney function by monitoring a lab test called creatinine, alerting the doctor to adjust the dose of any of the many medicines that are excreted by the kidney when it detects evidence that the organ is failing. The Department of Veterans Affairs now has a national system—online at every VA hospital—that can tell a doctor in San Francisco what medications a patient received during his last visit to the VA's outpatient clinic in San Antonio. Salt Lake City's LDS Hospital keeps track of which antibiotics work best against certain organisms, taking into account the local bugs' unique an ever-changing antibiotic resistance patterns, giving physicians better tools for fighting infections."

But can we wait for an expensive, sophisticated, high-tech system to be up and running in every hospital before tackling medication errors?

Back to basics

A study Wachter and Shojania cite in the *British Medical Journal* screened the handwriting of 209 doctors, managers and health care executives, giving

* Excerpted by permission from *Internal Bleeding: the Truth Behind America's Terrifying Epidemic of Medical Mistakes*, by Robert M. Wachter, MD, and Kaveh G. Shojania, MD. Rugged Land Publishers, to be released February 2004. *ISBN 1590710169*. (Reviewed by Atul Gawande, author of *Complications*.)

each 10 seconds to write the same sentence. Judges did not know the writer's profession. "It turned out that the physicians' handwriting was terrible, scoring 7.1 out of a possible 13 points, leaving lots of room for improvement. But the non-physicians' notes were nearly as indecipherable."

It may be that hurried, harried people write poorly. However, an illegible order communicates an unmistakable disrespect on the part of the person issuing it: somebody down the line has to read it. The consequences of illegibility include potential threat to a patient's health or life. And as drug names themselves become more similar and confusing, it's not enough for a certain pharmacist to be able to decipher the scribbles of a certain physician.

One hospital's approach

One hospital in our region is tackling medication errors of all kinds, in real time. UPMC Northwest is in the midst of implementing an ambitious program, with some guidance from PRHI, to track each potential medication error. The idea is to track each problem to its root cause, and find a way to fix it.

Already CEO Neil Todhunter has drawn one line in the sand: the pharmacy will not process any illegible order. This makes for a lot of phone calls to clarify orders—in fact, the clarification process is estimated to consume up to 19.7 hours per day, or the equivalent of 2.5 full time employees (FTEs). But by moving the problem upstream, to the person issuing the order, UPMC Northwest hopes ultimately to free the time of these employees to work on other areas of medication safety.

Todhunter stood for a morning in one unit, observing handwriting and asking questions about orders. Part of the problem is that those submitting prescriptions cannot tell whether their writing will be deemed readable. If an employee could read prescriptions the moment they were written, immediately letting the writer know whether it could be read, the root causes of the problem could be immediately exposed and dealt with. A new experiment is being formulated to give immediate feedback on legibility. UPMC Northwest's pursuit of this one-by-one, "yes-no" approach is promising.

Physicians themselves are getting into the act now, experimenting with ways to help remove the guesswork. It's a start.

Hospitals will continue to confront medication errors—many stemming from illegibility. PRHI looks forward to sharing ideas about dealing with them.

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