

HANDWRITING ERRORS: HARMFUL, WASTEFUL AND PREVENTABLE

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It is not unusual to hear jokes about the poor handwriting of physicians. The purpose of this article is to convince the reader that these anecdotes hold some truth. Bad handwriting interferes with effective communication, is inefficient, and endangers patients.

In a 1998 study from the *British Medical Journal*, the researchers determined that, compared to other healthcare professionals and administrators, physicians had the worst handwriting of all.¹

From prescriptions to physician signatures, and from progress notes to referral letters, bad handwriting is a concern in every aspect of patient care. Pharmacists must be able to read medication orders, nurses must be able to determine whom to ask if they have a question about an order, and other physicians must be able to extract information efficiently from patient charts.

In a 1986 study from the *New England Journal of Medicine*, out of 50 outpatient progress notes, 16% of all words were illegible.² That means that almost one out of every six words could not be deciphered. In a profession where words are used so economically, this proportion is quite significant. Compounding this problem is the fact that poor handwriting by physicians is riskier than poor handwriting by other professionals.³ The inability to read a grant proposal or a business report is very different from being able to read an unconscious patient's past medical history or drug allergies.

There are many ways by which illegible notes, signatures, and prescriptions result in a lower quality of health care. These include lost time and money, medication errors, inefficient or faulty communication, and legal issues.

Illegible Medical Records are a Waste of Professional Time

In a 1979 study published in the *Journal of the American Medical Association*, the researchers found that one-half of all orders written in a 500-bed teaching hospital required extra time to interpret because of poor handwriting.⁴ This means that not only were physicians forced to spend less time with patients, but pharmacists were forced to spend less time filling prescriptions, and nurses were forced to spend less time on patient care. This is also exceptionally important when considering a medical emergency.

In a chart review comparing written to typed primary care progress notes, it was determined that written notes took 46% longer to read than typed notes. More significant, however, was the fact that after reading a written note it took physicians 11% longer to answer questions about what they read.⁵ This means that not only is it taking more time for the contents of the

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charts to be read, but they are not being read as well.

Illegible Prescriptions Can Result in Medication Errors

In one case reported in *Lancet*, a physician prescribed an asthmatic patient Amoxil, an anti-infective. The pharmacist misinterpreted the word “amoxil,” written poorly in lower case on the prescription, and dispensed “daonil,” an anti-diabetic drug. This resulted in severe and dangerous hypoglycemia for the patient.⁶

Perhaps the most infamous example of the dangers of illegible handwriting to date occurred when a misfiled prescription resulted in the recent death of a Texas man. The prescription for Isordil, a drug to treat angina, was filled by the pharmacist as Plendil, a calcium channel blocker. A Texas jury awarded the patient’s family \$450,000. The physician was required to pay half of this award, and the pharmacist the other \$250,000.⁶

It may seem like a simple and effective solution to the problem of medication errors to insist that the pharmacy call the physician with any questions about the prescription. However, this brings us back to our initial concern: wasting time. The pharmacy must take the time to contact the physician’s office, the physician’s secretary must direct the call, and both the physician and pharmacist must spend the time deciphering the meaning of the poorly written prescription. Yet, this situation is ideal considering the consequences of misinterpreting an illegible medication order.

The Dangers of Misinterpretation are Greater When the Physician Signature is Illegible

An illegible signature on a prescription or hospital order means that neither a pharmacist nor any staff member will be able to contact the prescribing or ordering physician with questions. In a 1986 study in the *New England Journal of Medicine*, only 14% of the 50 outpatient progress notes had legible signatures.² That means 86% of the time, other health care personnel participating in the care of the patient did not know whom to contact with inquiries about patient management, concerns, or in case of an emergency.

If a nurse cannot easily access the physician to clarify his orders, a situation like the one described in *Medical Trial Techniques Quarterly* in 1981 may occur. In this instance, a nurse misinterpreted a physician’s order for a cardiac medication and injected the dose instead of administering the elixir form of the medication. This resulted in the patient’s death.⁸

Illegible Handwriting in the Medical Field is Costly

In 1963, one researcher determined that 40% of the orders written in a 340-bed hospital were less legible than average. He calculated that the time the hospital staff wasted deciphering these orders came to \$12,000 per year.⁹ Considering not only inflation, but also how health insurance practices have changed, it is reasonable to conclude that the amount of money wasted in hospitals today because of illegible handwriting is substantially larger.

Illegible Health Care Documents Fail to Communicate Important Information

In a 1993 study from the *New Zealand Medical Journal*, it was found that 37% of the referral letters from the primary care physician to the emergency room were difficult to read or illegible.¹⁰ This is particularly alarming considering that many patients who enter the emergency room cannot effectively communicate.

Illegible Medical Records Create Potential Legal Problems

It is well known in the world of medical documentation that if it is not written in the chart, it did not happen. But what if it cannot be read? What type of defense is, “I know the jury cannot tell for certain, but that does say ‘informed consent was given’”?

The court stated in *Norton v Argonaut Insurance Company* (144 So2d 249) that physicians have a duty to make their intentions “clear and unmistakable” and that the physicians must “make certain” of the lines of communication between them and anyone who may execute their orders.⁸

The Best Part About Illegible Handwriting

What is the best thing about illegible handwriting? It can be prevented.

Bad writing is more like bad manners than bad features: it is unpleasant to the beholder, like an ugly face, but, unlike it, is easily corrigible.

- E.W. Playfair¹¹

If illegible handwriting is preventable, then why has this practice persisted? Because physicians are constantly rushed.

In a 1997 study by the *American Journal of Emergency Medicine*, it was determined that higher patient entry rates into an emergency room negatively affected the quality of handwritten notes. The investigators found a positive correlation between patient entry rates and documentation error. This correlation was missing when the researchers examined dictated charts. It was also concluded that the number of omissions in handwritten emergency department records was directly proportional to the patient workload.¹² According to this data, the busier the physician, the less likely that his handwritten notes will be legible and complete.

In a 1996 study by the *British Medical Journal*, it was found that the faster a person wrote, the less legible the writing.³

Conclusion and Recommendations for Amending the Problem

Not every person who enters medical school is genetically predetermined to have poor penmanship. The problem lies with the system. There have been many proposed solutions from the very simple to the complex and inexpensive.

One of the simplest solutions, if not the most simple solution, is to print and to avoid potentially confusing abbreviations.¹³

Some common and problematic abbreviations to avoid include: OD (can stand for “every day” or “right eye”); QD (can be confused with QID or OD); MS (can mean morphine sulfate, multiple sclerosis, mitral stenosis, medical student, muscle strength and mental status, among other things); U (can look like a zero).¹⁴

Suggestions for avoiding misinterpretation of medication dosages include: Using a zero before a decimal, as .5 grams can easily be interpreted as 5 grams; using no terminal zeros, as 5.0 grams can

easily be interpreted as 50 grams; and avoiding all decimals if possible, such as using 500 milligrams instead of 0.5 grams.¹⁵

Other easily applied suggestions to help avoid medication errors include educating the patient on the name, purpose, dosage and form of the medication; having the patient bring his medications to every appointment for review; and encouraging the pharmacist to call with any questions.¹⁶

Another possibility to consider in attempting to avoid the dangers of poor handwriting by physicians is the role of other healthcare professionals.

An assistant with good handwriting in the physician's office could write the prescription as directed by the physician, then have the physician sign it. The drawback to this being that someone must pay the salary of the prescription writer.¹⁶

The benefits of nurses and staff proofreading prescription orders are significant. A 1994 study in the *Archives of Pediatric and Adolescent Medicine* found verbal orders in an acute-care children's hospital to have significantly lower error rates than handwritten or computer entered orders because the nurse taking the order could ask questions, correct mistakes, and add clarification to the order the physician was giving.¹⁷ However, the same drawback exists. Someone must pay for the staff time. Also, in a hospital setting, a nurse proofreading a physician's order is a nurse not with a patient.

Perhaps the best, yet most costly, answer to the problem of illegible handwriting by physicians is technology.

Technological solutions are almost without limit. Among them are dictation systems for all prescriptions, letters, notes, and orders; computer order entry; and typed, pre-printed prescription pads and order pages for computer generated prescriptions.^{2,15,16}

There are many solutions of varied cost and scope, but the problem does exist. Poor, illegible handwriting of prescriptions, orders, records, and signatures endangers patients and significantly lowers the standard of care.

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