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Chicken Scratch: The Illegibility of Physician Handwriting in Clinical Practice

by

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Abstract

The illegible chicken scratch characteristic of physicians has been the affectionate criticism of the profession for as long as most can remember. Lay people even joke that “physicians go to medical school to learn to write illegibly while pharmacists go to school to learn how to read what doctors write.” (Hughes, 2003). However, besides being an overgeneralization, this myth may even have fatal consequences.

Studies have shown there to be at least some truth to this myth - physicians do tend to write more illegibly than both their colleagues in the health system and those in other professions. The question then becomes one of causality - did the physician always write in chicken scratch or did something in his medical training or practice turn his script into illegible scrawl?

Perhaps more important than the etiology of illegible handwriting are the potential consequences. In 1999, the illegible handwriting on the prescription of a cardiologist resulted in the death of his patient, not to mention a \$225,000 fine to the cardiologist. Cases such as this have prompted the medical profession to re-evaluate its *blasé* attitude toward illegible handwriting. Medical schools, regulatory bodies and hospitals are beginning to implement rules and technology that aim to improve written communication.

Introduction

Physicians have a reputation of particularly poor penmanship. While historically the inability to write legibly has been accepted as simply an oddity of the profession, this quality has recently come under review. Numerous studies and case reports have shown that illegible prescriptions or clinic notes can have potentially fatal consequences. The medical profession has thus been forced to re-evaluate its attitude towards doctors' chicken scratch.

This article will examine the history and origin of the physician chicken scratch myth and the evidence for the existence of such a phenomenon. An analysis of factors that promote or cause illegible physician handwriting will provide a basis for the suggestion of interventions that can prevent potentially disastrous outcomes.

History and Veracity of the Myth

Before examining the origin of the “*chicken scratch myth*” it is first necessary to determine if there is in fact any truth to this popular conception. In their 1998 study, Lyons *et al.* found that when compared to other professions, physicians tend to produce

more illegible writing. They compared the handwriting of doctors to nurses and administrative staff using a computerized analysis system and found that the illegibility was surprisingly confined to letters. That is, the doctors produced illegible prose but readable numerals.

However, Schneider *et al.* (2006) claimed that doctors write no better or worse than other professionals with comparable education. They used a manual scoring method to compare physician writing to that of engineers, accountants, and lawyers and found that while profession had little relevance, 40% of men produced illegible script as opposed to only 20% of women (Schneider *et al.*, 2006). Yet in numerous other studies, it was consistently found that doctors produced, on average, more malformed individual letters (Rodriguez-Vera *et al.*, 2002).

Therefore, there is at least some verity behind the chicken scratch myth. The question then becomes *why* doctors are incapable of legible script. There is also the issues of causality - are people with indecipherable writing for some reason drawn to medicine, or is there also truth to the quip that "doctors go to medical school to learn to write illegibly"? (Hughes, 2003)

There may in fact be some truth to the idea that *cacography* (chicken scratch) has its origins in medical schools: Gupta *et al.* (2003) found that the more senior doctors had increasingly illegible handwriting as compared to the residents and medical students. An Irish study found that 95% of interns had legible signatures compared to only 9% of physicians (Daly *et al.*, 2006). Therefore, some aspect of medical training may in fact contribute to chicken scratch.

The first possibility is the lecture environment, in which students are under time pressure to copy down notes and figures. Many students develop a form of personal shorthand to facilitate the process. While intelligible to the individual, this shorthand may not be understood by other members of the care team. Thus medical school introduces two variables that education research has shown to impact on quality of handwriting - time restraint and the sense of personal identity that is associated with one's own form of writing.

The time constraint aspect has received considerable support in the literature. Gupta *et al.* (2003) found that busier practices or consults requiring multiple diagnoses were 69% more likely to produce prescriptions with at least one illegible drug mention. In addition to writing under time constraints, physicians are often required to write under space constraints. Beginning in medical school, doctors must learn to write at uncomfortable angles, in cramped quarters, often without the benefit of ruled paper. Early education research suggests that correct position, movement, and speed are the three requirements for producing legible script (Enstrom, 1965).

It thus appears that the environment of clinical practice is less than conducive to legible handwriting. However, this does not explain why Lyons *et al.* (1998) found that chicken scratch was largely confined to letters, sparing the legibility of numbers. This suggests that it is not so much that physicians are *incapable* of writing neatly, but they *choose* (whether it be subconsciously), not to. It is here that the view of medicine as an exclusive profession becomes particularly important.

There is a common stereotype that doctors do not write legibly. An internet search of “illegible physician handwriting” turned up numerous hits - not of papers explaining this phenomenon, but in the context of the acknowledgement sections of medical books and articles. Countless physicians thanked their administrative assistants for their patience in interpreting their “chicken scratch” or “scrawl.” It seems that illegible handwriting is as much a sign of belonging to the medical profession as the white coat. The public has come to expect illegible script from their physicians, and we have graciously complied.

Thus, what is lacking is a *motivation* to write legibly. Clearly, it is possible to do so, but the conditions of practice make it difficult, public preconceptions make it undesirable and lack of regulatory controls make cacography permissible. The *American College of Physician Executives* describe medicine as a “cottage industry” in which mass change can be difficult due to diffuse rather than central control (Zulick and Farmer, 2006). Rather than demanding that its members write legibly for the safety of patients, the profession perpetuates anecdotes. For example, the *Journal of the American Medical Association* (JAMA) reported an instance of 300 diplomas receiving an upside-down and backwards signature because the signature on the stamp was so illegible that the correct orientation could not be determined (Connolly, 2005). The *British Medical Journal* (BMJ) has cited similar accounts, chalking them up to “a devil may care attitude towards scrawl” (Hughes, 2003).

Two questions thus remain: where did the *blasé* attitude towards penmanship originate, and why do both patients and the medical professions perpetuate it? There is perhaps a unifying answer to these two questions. Handwriting experts have suggested that “legibility disintegrates under the speed of note taking and under the pressure of keeping pace with thought” (Enstrom, 1965). Patients prefer their physicians to be focused on the content rather than the form of the writing. Overly stylized writing may suggest an artistic rather than rational, scientific inclination. In matters of health, the public would prefer that their physician be consumed with treatment of the disorder rather than with producing an aesthetic script. Freemon (1959) reflects this view in his classic piece on penmanship and higher education:

Skill in writing is a kind of affectation, a kind of finishing school accomplishment like exaggerated manners. Attention to the form of writing is opposed to the concern of substance and preoccupation with the thought entails neglect of the mechanics of expression.

In addition to reflecting a misplaced focus, stylized handwriting may also suggest a lower professional status. With increasing reliance on computers, dictation services, and teleconferencing, there is diminishing need to learn to write legibly. Freemon (1959) has even suggested that there has been an inversion of common view-education and penmanship now have an inverse relationship rather than a direct correlation. An ability and desire to produce aesthetic script may be a reflection of decreased competency with technology or an inferior professional status (*i.e.*, no administrative assistants to attend to the minor details).

Thus, patients may unconsciously “demand” poor penmanship as reflection of depth of thought, level of education, and professional status. The medical profession, on the other hand, may embrace this reputation as another marker of the exclusivity of the profession. The history of the establishment of the medical profession is fraught with

examples of mass acceptance of an idea for the sake of group solidarity. For instance, in the late 18th century physicians discounted midwifery not because midwives posed a danger to patients, but because they competed for a very profitable population of patients (Wertz, 2005). In order to become established as a profession with the accompanying self-regulatory privileges, it was necessary for physicians to have a set of unifying characteristics. Illegible script was a trivial yet easily identifiable marker of a physician.

In sum, it appears that illegible handwriting is a result of a lack of motivation and convenience rather than a lack of ability. The public views illegible script as a marker of deep thought and the profession views it as a symbol of belonging. In addition, handwriting can be a significant part of personal identity, an aspect of personal expression that one is reluctant to change. Education research suggests that to improve handwriting, one must have the motivation to do so (Kosiewicz, 1982). With an increase in the number of medical errors being attributed to poor handwriting, the medical profession is now beginning to supply some needed motivation.

Impact of Illegible Writing

There are three main impacts of illegible writing: effect on patient outcomes, effects on medical colleagues, and influence on the physician. First, chicken scratch on prescriptions or in patient charts can result in improper treatment. The *Institute of Medicine* estimates that up to 98,000 Americans die annually as the result of medical errors (Schulman *et al.*, 2005). Medication errors contribute to 7,000 of these deaths, most often from name mix-ups (Hughes, 2003). For instance, illegible physician handwriting was deemed to be the cause of a fatal substitution of Plendil for Isordil in a 1999 Texas case. The wife of the patient was awarded \$450,000 in damages (Kihlstrom, 2000). In a British case, a pharmacist dispensed Daonil rather than Amoxil to a patient, resulting in permanent brain damage (Gupta *et al.*, 2003). In this case, the physician was deemed to be 25% responsible for the error, the pharmacist 75% responsible.

The latter case illustrates the second impact of illegible writing: scrawled orders must be read by other health care professionals. Sloppy writing not only opens up the possibility for error, but results in wasted time and resources. The Institute for the Study of Healthcare Organizations and Transactions estimates that pharmacists made over 150 million calls to physicians annually as a direct consequence of illegible prescriptions (Kihlstrom, 2000). In addition, Kozak *et al.* (1994) found that written notes took eleven seconds longer to read and five seconds longer to comprehend as compared to typed notes. Thus, chicken scratch can cost the health care system time, money, and team member satisfaction.

Finally, illegible writing has the possibility to feedback on the writer. Inattention to the form of writing has the possibility to breed neglect in other areas of practice. One would not conduct a clinic in sweatpants for fear of lowering standards and patient perceptions, but the same consideration is not afforded to the written word. In the case of malpractice suits, the admission of sloppy handwriting can be a damaging testimony, as it reflects less than due care and attention (Sokol and Hettige, 2006).

Solutions

Given that illegible physician handwriting is largely a product of the profession; the solution to the problem must come from within profession. Since physicians are in principal self-regulated, doctors must hold one another accountable. Such was the reasoning of the *American College of Physician Executives* (ACPE). They described an initiative in which hospitals instituted a policy that required doctors to judge one another's handwriting (Zulick and Farmer, 2006). The idea was that the collaborative nature of medicine could help to make each doctor accountable for standards of legibility. This solution is particularly important in the multidisciplinary environment of modern medicine. Historically, doctors wrote clinic notes for their own records, but today, those notes must be read by nurses, pharmacists, support therapists, and other physicians. Hence the logic of the ACPE campaign is to aim for making physicians accountable to the people who will be directly affected by their poor penmanship.

Some would argue that the solution needs to come one step earlier, at the level of education. It was shown that medical students do not inherently have poor handwriting; it comes as a result of suboptimal writing conditions and lack of emphasis on the importance of neatness. However, many medical schools are now instituting policies or at least awareness campaigns to improve legibility. For example, *Indiana University Medical School* now includes penmanship exercises in their curriculum and the *University of Western Ontario* included a section in the first year orientation package about the importance of developing a legible signature early. Given the role of continuing education in the medical profession, there are now several programs that aim to teach practicing physicians how to write neatly. For instance, *New Jersey Medical Center* hosts penmanship classes, focusing on producing legible prescriptions. In Winnipeg, the Regional Health Authority has launched a series of eight posters to be displayed in hospitals to remind doctors of the importance of writing neatly. In addition, the campaign encourages doctors to write the complete name of drugs rather than using abbreviations to further cut down on medication errors (Chan, 2007).

It may seem ironic that physicians are some of the most highly educated members of society, yet they must now return to the classroom to learn some of the most basic skills. Enstrom (1966) suggested that handwriting has been on the decline since the 1930s due to changes in the education system. In the early 1900s, children were taught by specialized "handwriting supervisors." There was focus on simply producing legible script, as compared to the education system today in which handwriting is integrated into other teaching units. Enstrom argues that the elimination of dedicated handwriting classes and supervisors was a mistake in early education, as penmanship must be learned early and correctly in order to produce ingrained habits. To instill proper habits, students should sit squarely, develop a proper grip, orient the paper at 30 degrees, and practice repetitively (Freemon, 1959). Therefore, the intervention may need to come even further upstream, at the level of early education.

In addition to intervention at the level of education, several initiatives have been started at the regulatory level. For instance, the *Medical Defence Union* issued the "Ten Commandments of Record Keeping," the first of which is "Thou shall write legibly" (Hughes, 2003). In Washington, Florida, Idaho, Maryland, Montana, and Tennessee, physicians are now legally banned from handwriting prescriptions. If the notes are not printed neatly or typed, pharmacists are not permitted to fill them (Cooper, 2006). While this law was a strong stance against illegibility, it was not well accepted by the

profession- doctors were reluctant to change their habits and pharmacists were uncomfortable with their new role as enforcers (Ostrom, 2006). Montana has taken the strictest stance, requiring pharmacists to report illegible prescriptions which can result in a \$500 fine to the physician (van Outeren, 2006).

Another popular intervention is the introduction of computerized records. In a 1998 article in *JAMA*, Schiff and Rucker made the bold claim that “physicians should never again write a prescription.” Studies have shown that computerized physician order entry (CPOE) not only eliminates the illegibility component, but also allows crosscheck against other patient information in order to avoid potentially harmful drug or allergic reactions. Shulman *et al.* (2005) found that there was a 4.8% error rate in CPOE prescriptions as compared to 6.7% in handwritten scripts. They further suggested that such computer programs could improve compliance with hospital protocols and evidence based practice. However, implementing the CPOE system will take time and is accompanied by a learning curve (as demonstrated by a decrease in CPOE errors over time in the 2005 study).

Other studies have focused more narrowly on the problem of illegible physician signatures. An Irish study examined three groups of physicians: those who signed their names as usual, those who printed their name in block capitals after their signature, and those who used a personal self-inking stamp after their signature. They found that only 37% of the signatures in the first group were legible (Daly *et al.*, 2006). The other two groups achieved nearly 100% legibility, but the problem was in compliance: 46% in the block capitals group and 77% in the stamp group. Therefore, there are relatively simple solutions to the cacography problem, but the dilemma is in implementation. In order to make legibility the norm, it is perhaps necessary to call on the same forces that made *illegibility* the current norm. That is, patient demand and professional approval.

Perhaps a further motivation for physicians to improve their script or switch to computers is the impact of writing on their *own* health. In 1898 the Italian pathologist, Dr. Gicelio Bizzorero (1846-1901) asserted that “penmanship is fraught with danger to the writer’s health” - it poses risks of scoliosis, venous congestion, epistaxis, dyspnea, dyspepsia, asthenopia. His solution was the typewriter, as it eliminates the poor ergonomics, eye strain, and “hygienic disadvantage” of writing. This early work also gives clues to the history of the chicken scratch problem, as he concludes his diatribe against handwriting with the sentiment that “there are many handwritings of which the attempted deciphering cannot but be highly injurious to the health of the unfortunate persons whose sad fate it is to endeavour to interpret the hieroglyphics.” (Reiling, 1998).

Conclusion

Chicken scratch, cacography, scrawl, hieroglyphics, 'the dance of an inked chicken on meth' (Ostrom, 2006); physician handwriting has been called many things, but the bottom line is that it is a product of the profession of medicine and the expectations of patients that can have deadly consequences. The problem dates back to at least the 19th century and became engrained over the years as a badge of membership in the exclusive medical profession. Today, the connotations of that badge are changing thanks to recognition of the consequences of illegible writing. New technologies, improved education, and a change in attitudes are proving to be solutions to the age old problem of physician chicken scratch.

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