

Doctor's Handwriting: A Review

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Abstract

It has been a common notion that most of the doctors have atrocious, illegible handwriting. Physician's illegible handwriting has been one of the most important contributing factors to the medical errors. The implications of this problem are far reaching and they affect the safety and quality of the health care. It can harm patients, lead to poor performance of nurses and the support staff, administration of incorrect drugs and doses, improper treatment schedules, and, last but not the least, the legal. In this review article, an effort has been made (1) to have an insight into this age-old problem of the doctors (2) to provide an overview of the illegible handwriting of the doctors negatively affecting the quality of medical care and (3) to inform a more comprehensive approach to the management of this avoidable medical error.

Key words: Illegible handwriting, quality of health care, doctor

Introduction

Many people think that most of the doctors have atrocious and illegible handwriting. Many a times one finds no exaggeration in this opinion. This has been the common notion about the doctor's handwriting over the centuries. Physician's illegible handwriting has been one of the most important contributing factor to medical errors ¹.The implications of this problem are far reaching and they affect the safety and quality of the health care. It can harm patients, lead to poor performance of nurses, and the support staff, lead to administration of incorrect drugs and doses, to improper treatment schedules, and, last but not the least, the legal ². The purposes of this review are (1) to have an insight into this age-old problem of the doctors (2) to provide an overview of the illegible handwriting of the doctors negatively affecting the quality of medical care and (3) to inform a more comprehensive approach to the management of this avoidable medical error.

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Epidemiology and Salient features of the problem:

Poor and illegible handwriting is not restricted to the doctors of one region or country but it is a global problem. Doctors, irrespective of the type of practice, specialty, and country of origin seem to be having this problem. However, male doctors seem to be having far worse handwriting than their female counterparts ^{3,4} and the senior doctor's handwritings are more illegible than their junior colleagues and students⁵.

Many times, the doctors themselves found wanting to read their handwriting. A surprising finding was seen in a study done by Lyons R et al⁶ BMJ. (1998) that the poor legibility was confined to letters of the alphabets rather than the numbers. This could be explained as the importance attached by the doctors to the legibility of drug doses. The doctors do show marvelous skills using the same group of muscles, which are used for writing. Here, we can draw a comparison with the well-known dystonias like writer's cramp etc. Another observation is that doctor's handwriting is no better at home than in the hospital.

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A lot of research and studies have been done to study the incidence of this problem at different part of the world and more or less the results seem to be the same. Javier Rodríguez-Vera et al⁷ found 15% of the clinical records were illegible in their study at a Spanish general hospital whereas Winslow EH¹ et al found 20% of the medical orders either illegible or legible with effort in a hospital at Texas. This was better than the report by an anonymous author in JAMA where the reported incidence was as high as 34%⁸. The experience of Rosa MB et al⁹ was no different; they found 19.3% of the handwritten prescriptions hardly legible or illegible while evaluating the prescriptions received at the pharmacy of a reference hospital in the state of Minas Gerais, southeastern Brazil. Mendonça JM¹⁰ in their analysis and detection of dental prescribing errors at primary health care units in Brazil found 26% of the prescription information that was classified as low legible or as illegible. Daniel K Sokol et al¹¹ after reviewing the various literature on this problem opined that poor handwriting is a significant problem in medicine. In a large study, spanning for nearly eight years, Gupta A K et al⁵ found the average incidence of illegible mentions as 1.44% while studying the variables affecting the incidence of illegible drug prescriptions in the United States.

The Truth about Doctors' Handwriting: In the Light of available studies

Do the doctors really have poor handwriting or is it an exaggeration? Though the poor handwriting is a significant problem in medicine¹¹, we need to know where the doctor's handwriting stands when compared to the other professionals. Berwick et al¹² in their study disproved the popular belief on doctor's handwriting. Their study showed that the doctors' handwriting was no worse than others were. They felt that the problems are inherent in average human writing-rather than treating doctors as if they were a special subpopulation. They also concluded that the handwriting of doctors was no less legible than that of non-doctors. This observation was later supported by another study done by Schneider et al³ in 2006. In this study, they compared, the legibility of doctor's handwriting with that of many other

non-healthcare providers adjusting age, sex, and education. The inference drawn was that the doctor's handwriting was no less legible than the others were. However, Lyons R⁶ et al in their study found supportive evidence for the commonly held belief about the poor legibility of doctor's handwriting in comparison to other professionals. The handwriting problem was observed, in spite of appealing them to write as neat as possible. Nevertheless, they found a rather surprising element in this problem that the illegibility was confined to the letters of the alphabet rather than the numbers. In another study, published in the Med. J. Australia by Goldsmith H et al¹³ where they studied a large population both doctors and non-doctors, it was observed that doctor's handwriting was far worse than the others.

Possible Reasons or Hypothesis Proposed for the Bad Handwriting:

The reasons for the doctors to write so badly are not very clear. However, there are many reasons, explanations, notions, wrong public perceptions, and scientific hypothesis put forward to explain this age-old problem of the doctors.

Common public opinions, notions, and misconceptions^{2, 14}:

- Doctors do scribble as they are not sure about the exact spelling of the medicines and leave it to the pharmacists/nurses decide. However, if this is true, the illegible handwriting should have been selective and should not have been for all the drugs or words.
- There could be unholy nexus between the pharmacist and the writing doctor. The doctors send the prescription in code words so that others cannot read. Nevertheless, if this was to be true, the government hospital doctors, military doctors, doctors of the NHS system etc., should not have had equally bad handwriting.
- Doctors are trying to keep the secrecy of the contents of their prescriptions. However, these days, open labeling of the names of the dispensed medicine make this explanation improbable.
- Doctors have written so much during their college days that the handwriting has deteriorated.

Scientific explanations or hypothesis:

- It is likely that poor handwriting is caused by bad habits acquired while taking lecture notes in medical school.
- Doctors during their college days have not paid enough attention to their handwriting.²
- A new graduate may consider that writing illegibly is the symbol of a busy practitioner and may follow the footsteps².
- The doctors, in the practice due to busy schedule develop this bad habit and the habit gets fortified in the future professional life. Many doctors do agree that their handwriting has gone bad to worse from the student days to the senior professionals.
- A few doctors take pride in their illegible handwriting and congratulate those who could read them.
- Writing illegibly is not a deliberate act to confuse people, but an unintentional consequence of giving due importance to other things now. We should acknowledge that they are no ordinary but the very people who show fine motor skills for complex surgical procedures.
- The doctors tend to put all the energy and focus into the diagnosis and treatment rather than the written notes or prescription and patient and their relatives anxiously waiting to receive the prescription add on. However, doctor's handwriting is no better, when they write general letters during leisure hours at home.
- Doctors write in a hurry to clear the appointment list of the patients waiting outside for their turn.
- The workload may negatively affect documentation accuracy when the charts are handwritten¹⁵ and the faster a person writes, the less legible the writing is¹².
- Doctors switch over to ballpoint pens from the traditional fountain pens¹⁴.

The Patient Perspectives of this problem:

Illegible handwriting could result in wrong dosage, wrong route of administration and wrong drug being dispensed. There could be undue delay in the treatment due to illegible handwriting of the doctors. It may lead to unnecessary tests and can result in discomfort and sometimes death of the patients. The death of a patient in Texas, who was given

wrong medicine because of illegible prescription by a cardiologist, will keep reminding the medical fraternity about the dangerous consequences of poor penmanship, all over the world. Here, the pharmacist dispensed Plendil, an anti-hypertensive drug instead of the prescribed anti angina drug Isordil¹⁶. There are many equally infamous examples of the dangers of the illegible handwriting; one such reported case was published in the Lancet. Here, the pharmacist mistook "daonil" an anti-diabetic drug to the actually prescribed "amoxil" an antibiotic and the patient suffered from severe hypoglycemia¹⁷. There are instances where the staff nurses found it difficult to read the doctor's orders and administered the wrong dose or wrong route resulting in patient's death¹⁸. A patient in Istanbul, Turkey developed upper gastrointestinal bleed when his lansoprazole tablet was wrongly replaced by naproxen¹⁹. It is a bitter truth that up to 30,000 British die every year due to medical errors and illegible prescriptions do take a fair share in this²⁰. According to a July 2006 report from the National Academies of Science's Institute of Medicine (IOM), preventable medication mistakes harm more than 1.5 million Americans annually. Many such errors result from unclear abbreviations, dosage indications, and illegible writing out of the 3.2 billion prescriptions written in the U S every year.

The Colleague's Perspectives:

Inadvertent drug substitutions do occur in our practices due to the combination of the physician's illegible handwriting on prescriptions and the pharmacist's or other health care staff's misinterpretation. However, we know, these are preventable errors²¹. The doctors with poor and illegible handwriting should understand that their colleagues are no experts in cryptology and these members of the health care team have to undergo frustration and waste lots of time while trying to decode the chicken scratch on the case notes or prescription¹⁰. Not only that, an illegible signature or failure to print prescribers' name makes the efforts of the health care staff to clarify the orders or medical notes nearly impossible²². It is the assistants, staff nurses, colleagues from other specialties and finally the pharmacists who dispense

the medicines are the ones the usual victims of the problem. Many studies have shown that the medical colleagues spent extra time to interpret the orders and notes because of poor handwriting^{8, 23}. Despite the computer revolution, much information in clinical records continues to be hand written. The originator may understand what has been written, but difficulties can arise when other parties are involved. There have been many reported cases where nurses administered wrong drug and wrong dosage due to the confusion over the illegible orders^{24, 18}. Similarly, there are enough reports of pharmacists erring because of the poor legibility of the prescription^{2, 8, 17, 16}. Hence, the communication between the physician and the pharmacist is critical in preventing the dispensing errors in view of the poor legibility of the prescriptions²¹.

Legal Implications:

Illegible handwriting in medical records can have adverse medico-legal implications. It is not a new thing to accuse doctors and pharmacists of professional negligence for the wrong interpretation and illegible handwriting¹⁸. Writing illegible medical orders has been equated to professional negligence by the courts. Many doctors have been sued in the court of law in various countries for the harm caused due to the negligence in writing legible prescription or medical orders^{16, 19}. The jury at sloppy care could interpret sloppy handwriting. In a lawsuit the court stated 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^{25, 18}. Many a times, both the physician who wrote illegible prescription and the pharmacist who dispensed the wrong drug without verification were found equally guilty in the court of law. In the landmark judgment of Texas case, the jury awarded the patient's family \$450,000, in which the physician and the pharmacist shared the amount equally¹⁶. However, there are instances, where the pharmacists have been found guilty, as they did not contact the prescribing doctor for clarification of the illegible prescription. Over here, the court felt that the doctor's responsibility was less important than the others¹⁹. Six American states have passed legislation making doctor's illegible handwriting

a fineable offence. The US FDA recognized the bad handwriting as the cause of medication errors and has demanded the drugs names to be tested by simulating the process of dispensing drugs using handwritten prescriptions^{2, 26}. Even in India, the courts have also directed the doctors to write legibly²⁷.

Approaches To Improve or Solve this age-old problem

Whatever may be the reason for the bad handwriting, doctors cannot escape from the responsibility of issuing a legible prescription to the patients. There is a growing intolerance against this problem among the public and health care persons. There are many instances of misinterpretation of the badly written prescriptions by the nursing staff or the pharmacists, which lead to disastrous outcome among the patients^{16, 17, 19}.

An account of the Programs carried out to improve the legibility of physician's handwriting:

Healthcare providers all over the world have now accepted the poor legibility of the doctor's handwriting as an important problem in the management of the patients and a preventable medical error. Over and above this, there are the medico legal implications. Therefore, various groups in different parts of the world have tried various novel approaches to reduce this serious problem of the practitioners of medicine. A brief account of the effort taken is presented here.

Daly P et al²⁸, in their hospital in Wexford, Ireland showed that using a pen with personal self-inking stamp was an effective means to identify the signature of the doctors. In a similar effort, Glisson J K et al²⁹ proved that legibility of the physician's signature improved significantly when given a standardized discussion on the importance of legible signature and proper name stamp usage. Meyer TA³⁰ in Scotand White memorial hospital, USA set up an educational program for the physicians and the residents, illustrating the problems of poorly written prescriptions and the legal implications. The doctors were also given self-inking name stamps. This program did improve the legibility of the prescriptions in the intervention

group. Similarly, Boehringer PA²² tried to improve the quality of the order of writing process for the inpatient orders at teaching hospital in California. Over here, the physicians were asked to use a stamp with their name and pager number. It was observed that, the clarification regarding the prescription orders were carried out in a quick period. Thus, the use of self-inking name stamps containing name and designation of the doctors does help the colleagues, nurses, and pharmacists to identify the doctor with illegible handwriting and seek clarification in a quick time. This practice of using stamp with the name and designation of the doctor is seen in all the armed forces hospital in India and paying rich dividends. Francois P³¹ evaluated a program to improve the prescription writing quality at a university hospital in France. However, the results were well below the ideal standards. It was observed that the hospital staff had a positive opinion of the program that led to an awareness of the prescription problems.

Recommendations by the various Handwriting experts and the Professional Bodies^{1, 24, 32, 33, 34}:

- Drop the loops while writing the letters
- Close the tops of letters and numerals like 'o'
- Cross the letters of the alphabet like t, x, f or I soon after writing to avoid putting the marks in wrong place
- Try holding the pen between the index finger and middle finger, with the pen shaft resting by the large knuckles and writing end held in standard way
- Minimize slanting of the letters
- Avoid abbreviations on prescriptions and try to spell out all the words like Units for U, which could be mistaken as 'O' and subcutaneous for sc, which again could be for sublingual etc.
- Never use a zero after a decimal point, as .10mg might be read as 10mg and decimal point should never be the first element of a number (as in .10mg) and it should be 0.1mg. Never use a trailing zero for whole number expressions (like 5 mg and never 5.0mg). Whenever possible avoid the use of decimals(e.g., write 500 mg instead of 0.5 gm)
- Avoid using abbreviations like QD, OD, BD for dosage frequency, instead write daily or Q 12h or 8h etc.
- Specify the exact dosage (such as milligrams) instead of writing one tablet , one ampoule or vial
- Another recommendation is to go back to the fountain pens, which tend to slow one down and thereby, improve legibility¹⁴.
- Writing prescription in capital letters as advised by various medical councils in India could be another useful way out.

Educational interventions and other novel approaches:

- Regularly scrutinize the response of the nurses and the pharmacists to the handwritten prescriptions and instructions to assess the legibility of the doctor's handwriting.
- Under graduate and postgraduate medical administrators should take bad handwriting seriously and those taking handwriting lightly should be made to focus on it by virtue of penalties ². All medical students are given specific education and training to focus on their handwriting.
- Conduct educational programs, monitor medication order, and feedback on the handwriting of the doctors ¹.
- In a few states of India, the doctors have started a movement in the form of conducting workshops by the professional graphologists free of cost.
- A novel initiative has been taken up at the Munson Medical Centre, Traverse City, Michigan to eliminate many of the prescription errors by the doctors. This program utilized a layoff notice, which told the doctors about the errors in their medical orders or prescription regarding the dosage, frequency, route of administration and about the legibility of their handwriting. The program was said to have produced remarkable results³⁵.

Some practical tips to improve the poor handwriting:

As there are no instant solutions to this age-old problem, any tips or suggestions should be welcome. Here are a few such practical tips or suggestions:

1. Every day make conscious effort to write first a few prescriptions very neatly and legibly, if possible in capital letters and gradually increase

the number of such prescriptions. In the beginning, it may appear cumbersome and time consuming but as the time progresses the writing speed will pick up. However, be prepared to face anxious and restless receptionist at the office desk and the muttering patients who are used to the speedy of clearance of the appointment list. A neat and legible prescription will come as a bonus for their patience.

2. Another option, especially to those doctors who practice at more than one place is that they can try to write the prescriptions legibly and neatly to all the patients in the clinic where the appointment list is small.
3. While all these experiments are going on try to avoid writing long case notes. Instead, dictate to your junior colleagues or assistants.
4. Once, the handwriting improves, try this on case notes writing.
5. Try to use printed prescription forms with different columns for dose schedule, frequency, and route of administration etc. printed on it. The idea is to write minimal and tick the columns more.
6. The office secretary/ receptionist at the desk should enter the patient data like name, age etc. prior to the appointment.
7. Writing the prescription in bigger font size may make it more neat and clear.

All these exercises should be done with a conscious effort as there is always a risk of reverting to same old handwriting, if the doctor is not alert, as we know that 'old habits die hard'. The pleasant experience of going through one's neatly written prescription could be a motivating factor to write legibly.

Available alternatives to handwritten prescriptions and case notes:

If the handwriting of the doctors cannot be changed, the next best options are the technological solutions and there is no limit to these options.

- One of the options is to give dictation of the prescription and notes to an assistant with relatively good handwriting¹⁹. However, it is very difficult find a good assistant with equally good handwriting.

- Using the iPads or the tablets with fine writing styluses, which are useful just like pens for writing or drawing diagrams.
- Use of voice activated systems.
- Switch over to computer-generated prescriptions, computer order entries etc^{1, 21}. The computer medication order entry to ensure legibility and completeness of orders, which will also avoid wrong dose and drug-to-drug interactions etc¹.
- But, in a study West DW et al found the verbal orders in an acute care set up significantly lower error rates than the handwritten or computer entered orders, as the nurses could clarify the orders³⁶.
- Adoption of formatted order sheets, preprinted prescription pads.

Advantages of Digitizing the patient records and prescriptions:

- Legibility of the medical records will no longer be a problem.
- Doctors can quickly access the patient data from any corner of the world.
- Sharing of the patient data, investigations, various reports, and treatment plans among various members of the health care system quickly and instantly.
- Easy access to various patient data helps in the various types of studies and research.
- Doctors can be up to date with the various evidence-based treatment and the system prompt will avoid drug-to-drug interaction in prescriptions.
- There will be overall improvement in the quality and efficiency of medical care.

Draw backs of the technological solutions and computer typing:

- Most of the clinical notes involve line drawings, figures, various symbols' like +/- or arrows to indicate increase or decrease etc. which is very difficult to type. If one wants to typewrite one page of handwritten clinical notes, it may take two or three pages that too, in thrice times the duration.
- Possibility of typing errors while scrolling up or down to wrong formulation with computer scripts¹⁹

- It could be an annoying experience for the patient and the relatives to watch their doctor entering data like a sales person in cash counter of a departmental store rather than writing the prescription.

Conclusion

One would say that this would be like “listening to Bible from the devil’s mouth” as many of us including the author have bad handwriting. However, we know that, no doctor deliberately wants to write shabbily. It is said that accepting one’s weakness or mistake is the best and only way forward to solve the problem. Whatever may be the reason or justification for the bad handwriting, the fact is many of the doctors have bad handwriting and quite a few illegible handwriting. Poor handwriting of the doctors is more dangerous than the non-doctor’s. Any effort to improve the sloppy scrawls or scribbles of the doctors could be one of the most important preventable ventures to cut down the ‘iatrogenic’ morbidity and mortality. Hence, we should strive to have better penmanship than everyone else did and it is our duty to make our communications accurate and clear. It is the right time for all of us to do something about this menace, so that the doctor’s handwriting becomes neat and legible or else completely switch over to electronic or e-case notes and prescriptions. If we ignore this problem, a day may come where patients may urge our legislators to bring in an anti-scribble law or we may continue to witness special campaign like patient wearing a sticker stating, “I won’t accept a prescription if I can’t read the writing.”

Competing interests: none

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