

An Audit of the Quality of Primary Care Medical Records

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Abstract

Introduction

Maintaining clear, consistent patient records is vital. We assessed the quality of medical records of children attending the ophthalmology clinic at St Mary's Primary Care Centre, against HSE and NHS guidelines.

Aims

To assess standardization of records, establish if adequate details are recorded, suggest recommendations, and re-audit based on recommendations.

Methods

A randomised sample of 60 patient records was taken. Results and recommendations were presented to staff. A second audit cycle was conducted six months post intervention.

Results

Numerical legibility went from 5 (8.3%) to 48 (82.8%) legible. Lettering went from 4 (6.7%) to 23 (38.3%) legible. Abbreviation improved from one (1.7%) to 30 (52.6%) legible. Black ink improved from 18 (30%) records to 60 (100%).

Clarity improved from 2 (3.3%) to 42 (70%). Clarity of diagrams went from (64%) to 34 (92%). Labelled diagrams increased from 9 (17%) to 22 (59%). Dating increased from 37 (62%) to 57 (95%). Timed records decreased from three (5%) to none (0%). Job title went from 24 (40%) to 34 (57%). Printed names went from 15 (25%) to 32 (53%). Signed entries went from average 43% to 64%.

Labels improved from 52 (87%) to 58 (97%). Blank pages adherence went from 37 (78%) to 59 (98%). Correct medication names went from 18 (39%) to 24 (82%). No errors were corrected properly in either cycle (0 (0%)).

Discussion

Quality of records was poor. Many categories improved following intervention. While there are measures that can be taken to improve quality of handwritten records, electronic records remain the best method of assuring standardisation.

Introduction

Can you read the notes at your practice? Quality of patient records at St Mary's Primary Care Centre paediatric ophthalmology clinic was highlighted to management, and an audit requested. Poor documentation can lead to clinical, administrative, or legal complications.

Proper handwriting and legibility are the cornerstone of good medical record keeping¹. Lack of legible records can result in medical errors and miscommunications^{1,2,3}. This can cause unwanted outcomes; patient upset, significant harm, or possibly death¹. Inadequate documentation of medications can lead to prescribing errors⁴, causing wrong dosage or medication administration. Illegible handwriting causes loss of effective working time as extra time is needed for reading. Often faculty need to recruit others to decipher notes^{1,5}.

Often records are left unsigned, no author identified¹. If a signature is present but unidentifiable, with no printed name, it is impossible to verify the writer or contact them for follow up or query⁵. Identifying the writer is crucial for medicolegal reasons. Records are the physician's best argument for their quality of care². Illegible documents, with no patient details, left unsigned are useless in court. Incomplete record of date and time means incomplete timeline of care. Sloppy documentation infers sloppy medical care to those reviewing the case², even if treatment was appropriate. For audit all details need to be recorded, and clearly, to assess adherence or merit of care³. If a record cannot be deciphered, it may as well have never been written.

Studies on quality of handwritten notes in Irish healthcare are limited, especially in general practice. A study in Mayo found inadequate record of time, patient details, author's name, and job title⁶. A study of handwriting conducted in Cork hospitals found 22.2% of records mostly or totally illegible, higher than in comparable studies conducted in the United States and Spain⁷. Another in Dublin discovered 4.6% of notes had "no unique identifier" for patients, and only 50% contained the doctor's name⁴. Time of consultation was recorded 36.3% of the time and medications were "listed by name" in 62.3%. Although 95% of notes were signed, most were illegible, rendering them effectively anonymous⁴. Evidently the quality of handwritten notes in Irish hospitals is variable.

Aims

Records were assessed against Health Service Executive (HSE) Standards and Recommended Practices for Healthcare Records Management⁸, and National Health Service (NHS) Professionals- CG2 Record Keeping Guidelines⁹. The objectives were to assess standardization

of patient notes, and adequate recording of details. The second cycle objectives were to suggest recommendations for improvement subject to findings, and re-audit based on these.

Methods

This was a cross-sectional descriptive clinical audit. The average number of patients attending each month was estimated at six hundred, the sample size being ten percent of this value. A randomised sample of 60 patient records was taken from all attending the clinic in September 2020. September was identified as the month children are most likely to attend, due to return to school. All data was completely anonymised.

The sample was stratified according to four main clinicians; an equal number sampled from each. A random number generating system, corresponding with the patient list was used. Records were excluded if duplicate, unavailable to be viewed, and if the patient did not attend post intervention. The second audit cycle population consisted of patients attending in September 2021, six months post intervention.

An educational intervention was held in March 2021 to present first cycle findings and identify challenges towards adherence. The importance and reasoning behind guidelines were reiterated. Legibility of abbreviations was stressed. Black pens were placed in each room. A checklist of guidelines was hung in each clinic room (see appendices).

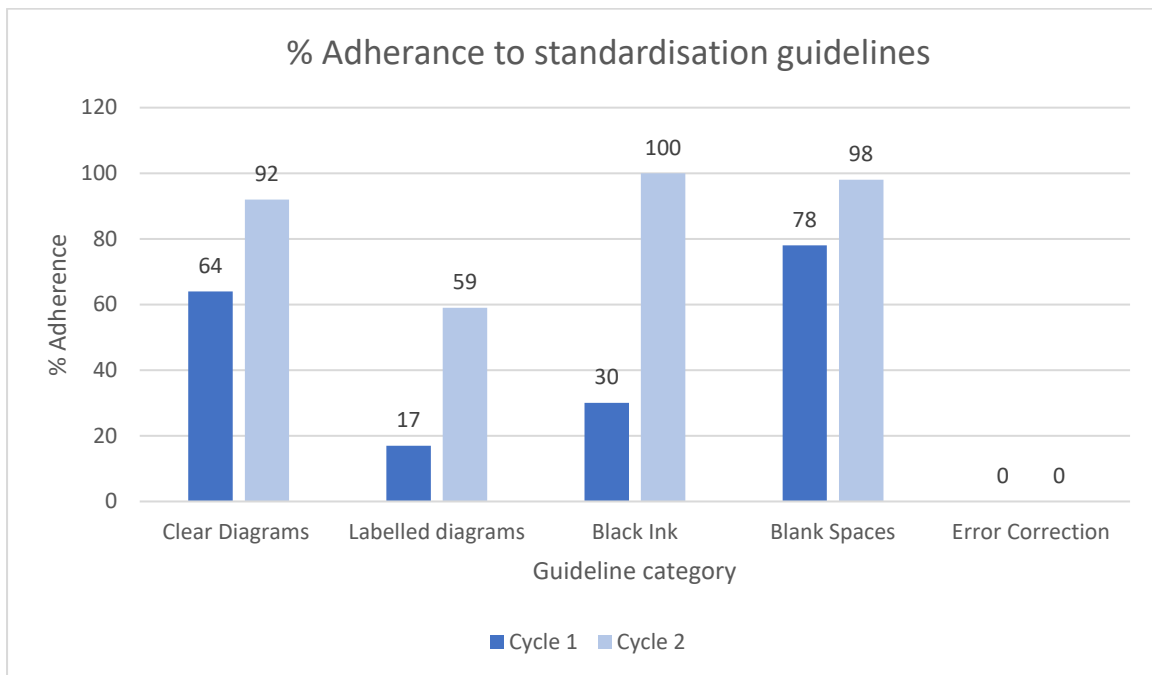
Data was entered into an Excel sheet. Legibility and clarity were scored using the Adjusted Note Keeping and Legibility (ANKLe) score^{3,7,14} (see appendices). Other categories were assigned numerical values on a yes or no basis. Chi square testing was performed on quantitative data at a 5 percent significance level ($p < 0.05$). Data was analysed using the IBM SPSS Statistics program.

Results

Numerical legibility improved most from 5 (8.3%) to 48 (82.8%) legible. Lettering legibility showed least improvement from 4 (6.7%) to 23 (38.3%) legible. Almost every entry contained abbreviations pre intervention (60 (100%), $n=60$) and post intervention (57 (95%, $n=60$). Abbreviation legibility improved from one patient note (1.7%) to 30 (52.6%) legible. First cycle ink colour varied, red and green ink were often featured. Use of black ink improved from 18 (30%) records to 60 (100%).

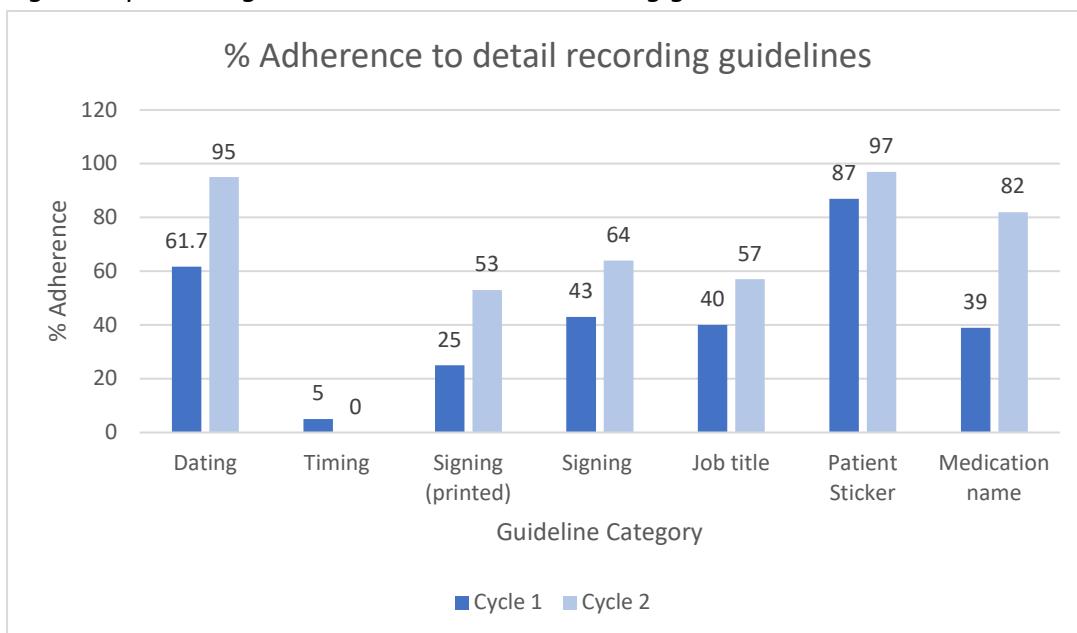
Overall clarity improved from 2 (3.3%) clear records to 42 (70%). In cycle one, 52 records contained diagrams ($n=52$), of which 32 (64%) were clear. This improved to 34 (92%) out a total of 37 ($n=37$) ($p=0.001$). Labelling of diagrams increased from 9 (17%) out of 52 total ($n=52$) diagrams, to 22 (59%) ($n=37$) ($p = 0.00004$).

Figure 1: percentage adherence to standardisation guidelines



Initially 37 (62%) of records were fully dated. This increased to 57 (95%) ($p=0$). Timing decreased from three records containing timed entries (5%) to complete non-adherence (0 (0%)). None were fully adherent in every entry. Specification of job title was found in 24 (40%) records in the first cycle, and 34 (57%) in the second ($p=0.067$). Printed names initially featured in 15 (25%) notes, increasing to 32 (53%) ($p=0.001$). In the first cycle on average 43% of individual entries in each record had a signature. On re-audit a mean of 64% of entries were signed.

Figure 2: percentage adherence to detail recording guidelines



Patient labels were included on each page in 52 (87%) initially, increasing to 58 (97%) ($p=0.04$). Adherence to no blank pages or spaces was found in 37 (78%) of records in cycle one, improving to 59 (98%) ($p=0.0001$). In cycle one, out of 46 ($n=46$) total patient notes that contained medication names, 18 (39%) were written in full. In cycle two 24 (82%) records adhered out of 29 ($n=29$) ($p=0.0002$). Out of 30 records containing errors in cycle one none of them (0 (0%), $n=30$) were corrected per guidelines. Out of four containing errors in cycle two, none (0 (0%), $n=4$) adhered.

Full audit findings are summarised below.

Table 1: Assessing standardisation of qualitative data

Objectives	Sub-topic	Legible/Clear		Somewhat legible/clear		Legible with difficulty/unclear		Largely illegible/very unclear	
		Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2
Assess Standardisation ($n=60$)	Lettering legibility ($n=60$)	4 (6.7%)	23 (38.3%)	35 (58.3%)	29 (48.3%)	19 (31.7%)	4 (6.7%)	2 (3.3%)	2 (3.3%)
	Abbreviation legibility (C1 $n=60$, C2 $n=57$)	1 (1.7%)	30 (52.6%)	39 (65%)	23 (40.4%)	18 (30%)	3 (5.3%)	2 (3.3%)	1 (1.7%)
	Numerical legibility (C1 $n=60$, C2 $n=58$)	5 (8.3%)	48 (82.8%)	42 (70%)	8 (13.8%)	13 (21.7%)	2 (3.4%)	0 (0%)	0 (0%)
	Clarity ($n=60$)	2 (3.3%)	42 (70%)	45 (75%)	10 (16.7%)	8 (13.3%)	2 (3.3%)	5 (8.3%)	6 (10%)

Table 2: Assessing standardisation of quantitative data

Objectives	Sub-topic	Yes		No		N/A	
		Cycle 1	Cycle 2	Cycle 1	Cycle 2	Cycle 1	Cycle 2
Assess Standardisation ($n=60$)	Ink Colour	18 (30%)	60 (100%)	42 (70%)	0 (0%)	-	-
	Clear Diagrams	32 (54%)	34 (56.7%)	20 (33%)	3 (5%)	8 (13%)	23 (38.3%)

	Labelled Diagrams	9 (15%)	22 (36.7%)	43 (72%)	15 (25%)	8 (13%)	23 (38.3%)
	Blank Spaces	13 (22%)	1 (2%)	47 (78%)	59 (98%)	-	-
	Abbreviations	60 (100%)	60 (100%)	0 (0%)	0 (0%)	-	-
	Errors	0 (0%)	0 (0%)	30 (50%)	4 (6.7%)	30 (50%)	56 (93.3%)
Establish Details Recorded (n=60)	Dating	37 (61.7%)	57 (95%)	23 (38.3%)	3 (5%)	-	-
	Timing	3 (5%)	0 (0%)	57 (95%)	60 (100%)	-	-
	Signing (printed)	15 (25%)	32 (53%)	45 (75%)	28 (47%)	-	-
	Job Title	24 (40%)	34 (57%)	36 (60%)	26 (43%)	-	-
	Patient Detail Sticker	52 (87%)	55 (97%)	8 (13%)	2 (3%)	-	-
	Medication Name in Full	18 (30%)	24 (40%)	29 (48.3%)	5 (8.3%)	13 (21.7%)	31 (51.7%)

Discussion

Overall clarity improved significantly. Initially most records were mostly illegible/ unclear and mostly unclear/ unclear. Entries were often crowded to fit the end of the page. It was difficult to identify where diagrams started and stopped, or what they related to, as they lacked labels. Numerical legibility was poor, adding to ambiguity. Often entries written the same day were left undated and unsigned even though multiple people contributed throughout the consultation. Clarity improvement was mostly due to better numerical and abbreviation legibility, dating, signing, clearer diagrams, and spacing. There were positive and negative outliers among staff in terms of clarity, making the data more balanced than if each contributor were assessed separately.

Handwriting legibility did not contribute to increased clarity, most records remained somewhat legible throughout. Abbreviation use, timing, error correction, and job title specification did not show statistically significant improvement. Categories that showed complete non-adherence post intervention, were also not adhered to pre intervention, perhaps reflecting staff attitudes towards certain criteria of record keeping.

Once need to pay more attention to patient label restocking in files was stressed, and importance of each page being labelled was discussed, improvement was found. This was significant as pages were often loose and separate from the main file.

Although per guidelines abbreviations should not be used, they were used throughout regardless. Abbreviating frequently used terms is a simple way to speed up writing and is common in practice¹⁵. Lack of improvement in this category was anticipated prior to reaudit. Emphasising the need for legibility increased clarity without having to eliminate abbreviation. Interestingly, clinicians were more inclined to improve abbreviation legibility than handwriting legibility. A list of commonly used abbreviations could help, previously agreed upon by staff and management. Lists are not applicable in hospital, with significant overlap of specialities, and abbreviations being harder to distinguish.

Although relative improvement was found in almost every category, many were unsatisfactory post intervention. Second cycle lettering legibility reached only thirty eight percent and printed names featured in just over half of records. Ideally compliance to guidelines would be at minimum eighty percent adherence.

One of the biggest issues identified was perceived lack of time to record notes. Handwriting legibility, timing, signing, clarity of diagrams and correct amendment of mistakes are all possibly affected by this. Time pressure is a likely cause for non-compliance. Low time and poor handwriting have been found to correlate¹⁴. There is scope for additional research into doctor's attitudes towards record keeping, and factors for non-adherence in handwritten notes. Recording of time and error correction guidelines were completely not adhered to. This could be most easily solved with a computerised system, where date, time are automatically logged and amended errors are not recorded.

Electronic records are the most obvious solution for legibility and standardisation. They eliminate the need to remember multiple criteria, most parameters are included automatically. Computerised records have been shown to ensure legibility and improve clarity in general practice¹⁵. The same study found paperless records lead to more complete recording of information, more words being used versus paper records, and more complete record of diagnoses, medication doses, and advice given¹⁵. Electronic records provide multiple people access simultaneously from different locations. This allows for more flexible practice, facilitates interdisciplinary care, and ensures less time wasted on locating notes¹⁴. Overall, the literature indicates "improvements in data quality, presentation, availability, and legibility, increased productivity, and reductions in medication and data input errors" upon utilisation of electronic records¹⁵.

Computerised records are not without fault, some report writing them can be more time consuming than paper¹⁴. They feature a more rigid note template, making it difficult to find correct words or categories for certain information¹⁴. They are expensive and time-consuming to put into practice. Many Irish general practices have already implemented electronic notes. This audit was carried out in primary care, but is relevant across all fields, particularly Irish hospital medical note standards. The handwritten note remains most prevalent, and its quality is below standard^{4,6,7}. Since electronic records will not be the majority for many years, other methods must be resorted to in the meantime to raise average note standard.

Some adherence issues were administrative, and easily solved. Shortage of black pens and patient labels needs flagging to administrative staff as soon as noticed. Stamps with clinician's name, job title, and the date are very helpful. Since eyedrops were effectively the only medications used at the clinic, there was a laxity noted towards recording eyedrop use. They were regularly abbreviated or written as "eyedrops". Stamps for medications most used are a fast and easy solution. Where a stamp cannot be made for every medication, the solution is time and effort. Medications should be written in full, in block capitals, with clear doses and routes. Checklists in each clinical area positively influenced guideline adherence. Visible checklists are effective in improving record keeping⁶, and are simple and cost-effective.

Educational sessions on record keeping could prove useful. Ideally staff should be trained in record keeping when starting a post. Junior doctors report not feeling confident in training received in this field⁶. The HSE provides an online training module on correct medical record keeping, easily accessed remotely. The module could serve as initial training, but likewise a method to refresh knowledge. Quality should be audited regularly when using paper records.

One limitation was the small number of individual entries in records available post intervention, due to short audit cycle time. Ideally records would be audited over a year post-intervention, by multiple reviewers to eliminate subjectivity. The study's strength lies in that the sample represented staff across multiple levels, including ophthalmologists, optometrists, orthoptists, and practice nurses. The patient population was similarly diverse, some availing of regular care, some attending occasionally for eye tests or check-ups. There is potential to assess and compare multiple primary care clinics that utilise paper records.

There is a continued need for standardisation of patient notes. While alternative measures can be taken to aid adherence, computerised records remain the most effective solution to standardisation and improvement of record quality.

Declaration of Conflicts of Interest:

None declared.

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Appendices:

Appendix A: Additional tables referenced in text

Table 1: ANKLe scoring system

Score	Criteria
Legible/Clear	All words clear
Mostly legible/Mostly clear	Some words unclear, overall meaning can be understood
Mostly illegible/Mostly unclear	Most words unclear, overall meaning not understood
Illegible/Unclear	Most or all words not identifiable

Appendix B: Checklist

Figure 3: Checklist used as part of intervention

Best Practice Record Keeping

Ask yourself the following questions:

- Are you printing your letters?
- Are you spacing out your entry?
- Are you writing in black ink?
- Is there a date, time, and printed signature on your entry?
- Are your diagrams clear and labelled?
- Are medications written in full?
- Are any errors corrected according to guidelines? (line through, date, initials)