Implementing speech-to-text systems for nursing documentation requires a cultural change in the way nurses view record keeping.

Applying speech-to-text systems in documentation

In this article...
- Difficulties of record keeping using electronic patient records
- Implementing a speech-to-text system for documentation
- Challenges of changing the way care is documented

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Abstract

The intensive care unit at Alder Hey Children’s Hospital decided to use a speech-to-text software program to release nurses from the increasing burden of complex, free-text documentation. Nurses were trained using a cascade technique at the bedside.

Background noise and staff accents were the main difficulties encountered during implementation. Our experience of this process has led us to develop a new appreciation of the human factors that affect documentation. Speech-to-text software can bring improvements to the quality of nursing documentation but, if benefits to patients are to be maximised, accompanying changes need to be made to how nurses think about, and produce, their documentation.

Difficulties of record keeping using electronic patient records

Implementing a speech-to-text system for documentation

Challenges of changing the way care is documented

Quantity versus quality

The amount of documentation required of nurses in Alder Hey’s ICU has increased significantly in the last 20 years, for a number of reasons (Box 1). Our patient population includes sicker, often clinically unstable children who require advanced therapies. Achieving a good standard of nursing documentation in a highly changeable clinical environment is a challenge.

We switched our nursing notes from paper to an EPR system a decade ago and staff have grown used to documenting their notes on a computer. However, our staff are not touch-typists and we felt this change in the method of recording patient notes has had a negative impact on the accuracy and quality of nursing records.

Documentation was no longer a matter of picking up a pen at an opportune moment but became a chore that involved logging in, selecting a patient, starting a note, and typing the information into categorised text fields. Nurses in our unit dealt with the requirements of documentation under time pressure by using shortcuts; documentation was completed once per shift and presented in a bullet-point style, which could be open to a different interpretation at a later date.

Reasons for nursing actions were rarely captured. With physical survival being the highest priority for the patient, capture of social and psychological responses to treatment or of communication with families was often only sketchy. These aspects of care do not lend themselves to the structured approach favoured by EPR database developers, neither are they suitable for the automatic capture of data from equipment, such as observation recordings and physical monitoring.

Electronic records take time to fill in, leading to shortcuts that can be misinterpreted

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5 key points

1. Documentation takes up a large proportion of nurses’ clinical time.
2. Producing detailed documentation in line with the Nursing and Midwifery Council’s guidance is challenging.
3. Speech-to-text technology is a simple and useful alternative to typing to fill in electronic patient records.
4. Implementing a new system of documentation requires cultural change.
5. Early signs suggest that using speech-to-text technology results in more-detailed record keeping.
Innovation

Nursing Practice

**BOX 1. REASONS FOR INCREASED DOCUMENTATION IN INTENSIVE CARE UNIT**

- Nurses have taken on many of the roles that used to be undertaken exclusively by doctors; these require specific documentation.
- The therapies available have become more complex – eg nurses deliver haemofiltration to support kidney function, extracorporeal membrane oxygenation to support the heart and lungs and wean patients from ventilation. The documentation for such therapies is extensive.
- Nurses are increasingly worried about litigation and need to record why they took particular actions rather than just describing them.
- The ability to keep children alive despite major life-threatening conditions means many children admitted to the ICU have long, complicated medical histories and complex needs – all of which need to be documented and communicated to the multidisciplinary team.
- The change in medical and nursing culture, whereby parents are now seen as partners in care, involves more communication than used to be required in a paternalistic medical environment.

**Rationale for the change**

We aimed to improve the quality of nursing documentation by providing a flexible tool that would allow nurses to capture free text easily using speech-to-text. This is particularly important for documenting the rationale for interventions to deal with the rapidly changing status of patients in ICU, and for recording details of information given about care and treatment (NMC, 2010).

We chose Nuance’s Dragon Medical Network Edition, which is a speech-to-text program. The user speaks into a microphone and the words are displayed on a screen. The software works with many commonly used programs including all Microsoft Office programs and modern EPR systems.

The software was selected from three alternative products as a result of its extensive library of medical terms. Out of the box, it recognises words that are commonplace in paediatric ICU nursing reports and gives the user the ability to add new words, phrases and acronyms. The program will also replace acronyms with the full version of the text – for example, “general TOF” is replaced with “tracheoesophageal fistula” and “cardiac TOF” with “tetralogy of Fallot”.

Templates can be set up to add large amounts of standardised text and reporting prompts. They have been used to guide the creation of nursing handover documentation and to ensure that essential data is recorded and communicated about patients with certain conditions such as head injuries or those on long-term ventilation. The handover template ensures that vital information is recorded and passed on to the other staff, in line with NMC (2010) guidance.

The advantage of templates is that they standardise documentation and reduce the time taken to document care. Frequently used comments and whole forms can be called to the computer screen using a simple voice command. As an example:
- Verbal command: “Dragon ward ready”
- Comment that appears on screen: “Patient is self-ventilating in [air] with saturations above [%]. Gases are satisfactory. Ready for transfer to the ward”.

Staff have the option to accept the default value (air) or to insert an alternative – for example, “30% oxygen by face mask” – into this field and then add the saturation value.

The templates provide a standardised way of prompting staff for the information that needs to be recorded, while permitting the individualisation that Alder Hey’s varied patient population requires. Fig 1 illustrates the user template for recording seizure activity.

**Implementation**

A grant of £167,000 was received following a successful bid to the Nursing Technology Fund in January 2014. This funded:
- Speech-to-text software (180 user profiles);
- 30 Nuance PowerMics;
- Technical support;
- Implementation.

The software was installed on every bedside computer in the ICU.

ICU is renowned for experiencing elevated noise levels (Bailey and Timmons, 2005) so the accuracy of capture from the noise-cancelling microphones was tested and proved effective within our intensive care environment.

**Training**

In June 2014, 10 “super users” were selected from the members of nursing staff and trained to act as trainers for the speech-to-text software. The roll-out to end users and adoption into practice began in July 2014.

The process for training staff was problematic. All areas of the NHS are under strain from service pressures and the intensive care area is no different. Finding time to properly train 160 nursing staff with the new software and equipment has been challenging.

**BOX 2. APPLYING VOICE-TO-TEXT TO NATIONAL GUIDANCE**

We believed that voice-to-text technology could help nursing staff to achieve the following recommendations, as set out in the Nursing and Midwifery Council’s (2010) guidance:

- Your records should be accurate and recorded in such a way that the meaning is clear.
- Records should be factual and not include unnecessary abbreviations, jargon, meaningless phrases or irrelevant speculation.
- You should record details of any assessments and reviews undertaken, and provide clear evidence of the arrangements you have made for future and ongoing care. This should also include details of information given about care and treatment.
- Records should identify any risks or problems that have arisen, and show the action taken to deal with them.
- You have a duty to communicate fully and effectively with your colleagues, ensuring they have all the information they need about the people in your care.
Most of the training was delivered at the bedside in sessions lasting 15-30 minutes. These provided an introduction for all staff and further support was available on request. It was difficult to train staff who only worked nights or occasional clinical shifts. In addition, convincing nurses to implement something new into their practice can be very challenging.

Staff with strong accents had slightly more difficulty in applying the new technology and required a longer training session. In a busy workplace, minor problems can sometimes act as a deterrent to the acceptance of innovation.

Confidentiality

Most nurses expressed concerns about confidentiality when it came to capturing sensitive information in a busy ICU where visitors might overhear. Trainers stressed nurses should consider the risk of being overheard in the same way they would when verbally communicating sensitive information to other staff.

Coping with accents

Special consideration had to be given to nurses with accents as the software was originally designed for the North American market. Although all staff speak English, the software did have problems with strong regional accents. With slightly extended training and using the software’s “improve dictation” functionality, the accuracy has been greatly improved.

All users are assigned a profile and the more they use the system, the more accurate the dictation becomes. Each time a nurse uses the software, the recording is sent to a central server that analyses the input and captures corrections and training vocalisations. When particular words are consistently mistranscribed, the computer can choose to train specifically on that word. By making a particular recording of a pronunciation of a word (vocalisation), the computer is more likely to transcribe it correctly in the future. This begins a positive feedback loop, which improves the accuracy of transcription after each session.

Integration with existing technology

While we were planning to introduce speech-to-text technology our ICU unit was also being upgraded to a new web-based EPR system. To stagger the introduction of changes, we decided to introduce speech-to-text before the new EPR system was finalised. The aim was to give staff the chance to learn how to use one new system at a time. We see a further opportunity to increase engagement when we deliver training on the new EPR and demonstrate the improvements to functionality.

Outcomes and the future

Since we introduced speech-to-text documentation we have seen an improvement in the amount of relevant detail in our nursing reports. An informal audit compared 20 sets of nursing notes created using the speech-to-text technology with 20 sets of nursing records made without it; we found: all the notes using the new system were more detailed; all users of speech-to-text continue to provide more detailed information than those who type their notes; there are fewer typing and spelling errors; notes flow better as they capture the nurse’s train of thought.

Due to a high turnover of staff along with maternity leave absences, we have not achieved our targets for training all staff members. Among those who have been trained, those who have experienced inconsistent success with essential commands are more likely to revert to typing than other staff members.

The nursing reports themselves are more readable as they are recorded in whole sentences rather than bullet points. Previously, nurses often typed their notes in upper case, which is more difficult to read—the software uses the appropriate mixed case, which allows staff to recognise word shapes more easily and find important details in the notes more quickly.

We believed speech-to-text could save time on documentation but, in practice, this has not been the case. Users appear to have a self-allotted time in their shift for documentation. We believe this to be a result of the changes in culture that came with the original move to electronic documentation. In this unit, nurses persist with the once-per-shift report instead of real-time capture. We plan to challenge this by emphasising the new way of working in real time.

Organisations introducing similar technology would be advised to consider the influence of historical practices on the way staff adopt new systems. The influence of nursing beliefs and culture surrounding nursing documentation merits further investigation.

A number of users have found the speech-to-text to be very beneficial, especially those who have struggled with documentation in the past, such as those with mild dyslexia.

Conclusion

In this implementation, speech-to-text technology brought advantages both in the level of detail captured in our nursing records and the readability of the records. The innovation will assist the paediatric ICU staff to meet the standards set out in the NMC’s (2010) guidelines for nursing documentation.

The new EPR will resolve many of the frustrations caused, such as inconsistent commands, and provide a fresh opportunity for us to embed the use of this technology into unit practice. The turnover of staff and a heavy workload both for end users and trainers continue to hamper our efforts to reach 100% of the staff with this innovation. However, we are committed to exploring and developing new ways in which this tool can be used to improve the accuracy of nursing documentation. We view the introduction of speech-to-text technology for our staff as a beginning, rather than an end point.

References

