The impact of clinical speech recognition in the Emergency Department

Results of a study at South Tees Hospitals NHS Foundation Trust

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Results of a study to analyse the impact of the use of clinical speech recognition in the Emergency Department at South Tees Hospitals NHS Foundation Trust

This report summarises the results of a study into the impact of Nuance Dragon Medical speech recognition deployed within the Emergency Department (ED) at South Tees Hospitals NHS Foundation Trust as reported by ED clinicians responding to an in-depth structured questionnaire. It provides learnings and recommendations for other healthcare leaders who may be investigating similar digital solutions to create complete, accurate and timely patient records.

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Forward

Enabling Our Vision of a Paperless Emergency Department

Dr Andrew Adair, ED Consultant and CCIO,
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South Tees Hospitals NHS Foundation Trust is the largest hospital trust in the Tees Valley serving the people of Middlesbrough, Redcar, Cleveland, Hambleton, Richmondshire and beyond. We have a workforce of around 9,000 providing a range of specialist regional services to 1.5 million people.

Despite earning national recognition as a healthcare Centre of Excellence, like many other providers we have been grappling with the significant challenges facing healthcare nationwide. Namely, to deliver high quality health services in an era of austerity and constrained budgets versus an increasing demand for these services arising from a growing and ageing population which presents with complex, long-term conditions.

The pressure on our doctors, nurses and the wider healthcare team is constant. Adding to the burden within the busy and demanding setting of an Emergency Department (ED) is the burgeoning volume of clinical documentation accompanying each patient's assessment and treatment. This has the potential to slow the flow of patients through the department and increase pressure on clinical staff.

The importance of complete, accurate and timely documentation to support the patient care journey cannot be understated but this should never be at the expense of the conversation and relationship between the clinician and patient. The intention has always been to introduce digital technologies such as the electronic patient record (EPR) to improve and streamline our delivery of care. It should empower, not overwhelm the team.

With the implementation of our departmental EMIS Symphony EPR we are creating paperless records in real-time to ensure potentially critical information is always available within the EPR for others to review and action at the point-of-care. However, our clinicians, who had previously hand written or used traditional dictation to create patient notes, are now limited to typing notes directly into the EPR.

With the team already working to maximum capacity we sought solutions to ease and speed both structured and unstructured (narrative) data entry into the EPR, reduce the overall documentation burden and enable the clinical team to stay focused on the patient care.

The solution we have chosen is Nuance Dragon Medical speech recognition software integrated into the EPR. Our goal has been to enable doctors, nurses and other healthcare professionals to input records in real-time using simply their voice.

To get a better idea of whether we were achieving our goals of ease, speed and quality, Nuance commissioned a study to analyse the impact of Nuance Dragon Medical speech recognition integrated into the EPR as well as other clinical documentation within our ED. The study provides a snapshot of the documentation challenges and the benefits of the speech recognition deployment as perceived by our clinicians.

We hope that the results of this study may also provide some learnings and guidance for other healthcare organisations embarking on similar initiatives.

> "Speech recognition has transformed our ED, releasing our doctors and nurses from the shackles of clinical documentation and enabling them to spend more time treating patients."

Dr Andrew Adair, ED Consultant and CCIO,
South Tees Hospitals NHS Foundation Trust

Introduction

The vision of a paperless NHS

The NHS is under tremendous and unrelenting strain. Its dedicated staff strive to deliver world-class services against the backdrop of increasing demand for services from a growing and ageing population and constrained budgets.

A Nuffield Trust report forecasts that such population growth could mean we need another 17,000 hospital beds by 2022[1]. The number of doctors, nurses, other healthcare professionals and equipment will all have to scale to meet such demand.

More patients generate more clinical documentation – the creation of which is a process that has the potential to remove clinicians from performing vital services in favour of carrying out time-sapping administration. The time spent on clinical documentation has been highlighted in a recent study from Nuance Communications. It reveals that 50% or more of a doctor´s time is spent on clinical documentation processes, with around 52 minutes per day spent searching for information[2].

In the same study, in over one in four (27%) instances of clinicians' reviewing clinical documentation, the required information was not even available or had insufficient detail/clarity at the time it was required. 41% of these instances can be directly attributed to lack of the completeness of medical notes.

A recent Freedom of Information request made on behalf of Nuance Communications also found that - for 9 in 10 Trusts questioned – administrative time is often spent by staff handwriting patient notes following consultations[3].

The NHS continues to invest in the digitisation of clinical documentation as part of the government's vision for a paperless NHS by 2020 as declared in its 2014 Five Year Forward View. The report states: "All patient and care records will be digital, real-time and interoperable by 2020. By 2018 clinicians in primary, urgent and emergency care and other key transitions of care contexts will be operating without needing to use paper records"[4].

For this commitment to become a reality, healthcare leaders need to think not only of investing in digital technologies but also the usability of these technologies by their clinicians.

50%

or more of a doctor´s time is spent on clinical documentation processes

"All patient and care records will be digital, real-time and interoperable by 2020. By 2018 clinicians in primary, urgent and emergency care and other key transitions of care contexts will be operating without needing to use paper records"

1 Nuffield Trust: NHS hospitals under pressure: trends in acute activity up to 2022
2 Nuance Communications: Clinical Documentation Challenge Report
3 Nuance Communications: Freedom of Information request
4 HM Government: Personalised Health and Care 2020: Using Data and Technology to Transform Outcomes for Patients and Citizens

Study

Scope

The ED at South Tees Hospitals NHS Foundation Trust (South Tees) has two separately located Emergency Departments (ED) at James Cook University Hospital and The Friarage Hospital. James Cook ED has three distinct clinical areas: The Main Department which includes paediatrics (Main), Resuscitation (Resus) and See and Treat (See & Treat) i.e. patients assessed with minor conditions. The Friarage has Main and Resus only. Early in 2017 both locations deployed Nuance Dragon Medical speech recognition in ED to help doctors and nurses quickly and accurately capture the patient story at the point of care and to improve the clinical documentation workflow.

Background

As earlier studies have identified, hand-writing or self-typing reports is widespread across NHS Trusts. This practice was also evident within ED at South Tees Hospitals NHS Foundation Trust prior to deploying the departmental EPR. For example, 95% of its Main department clinical team were either hand-typing or using pen and paper to create their patient records. See & Treat saw 53% of the clinical team relying on hand-writing and typing and 28% relying on traditional dictation using secretaries and support staff. For those working when dictation or audio typing was used, 32% of clinicians cited delays of one or two days in notes reaching patient records following consultations. 28% reported that this process typically took 2-6 days. Some clinicians - 9% - reported that notes took more than two weeks to reach clinical records – such that they could not be used in the ongoing treatment of the patient by other clinicians. Following implementation of the EPR it was anticipated that many clinicians, limited to typing notes directly into the EPR, would struggle to adopt the technology. There was a clear need to improve the ease and speed of creation as well as the quality of the patient record, capturing not just the structured information but also the narrative of the patients' care. There was also a requirement to reduce the overall documentation burden placed on the clinicians. Creating records in real-time would also ensure potentially critical information was available within the EPR for others to review. To overcome this usability challenge, South Tees Hospitals NHS Foundation Trust chose to deploy Nuance Dragon Medical speech recognition at both its ED sites and across all its three clinical areas; Main, Resus and See & Treat. Initial training introduced the clinical team to the use of speech recognition within the EPR and follow-up training a few weeks later ensured individuals were confident in its use.

Methodology

– An independent research consultancy, Ignetica, was engaged by Nuance to design and undertake a study to analyse the impact of speech recognition within ED at both locations, following its initial deployment.
– With deployment of speech recognition already completed before the start of the study it was necessary for the study to be undertaken on a retrospective, post deployment basis.
– Funding for the study dictated that it be undertaken on a clinician perception basis via questionnaire rather than with direct or observational measurement of any of the impacts.
– The study is based upon an in-depth structured questionnaire with clinicians in ED and provides a snapshot of the challenges that were overcome and the benefits as perceived by the participating clinicians.
– The questionnaire was completed by 44 clinicians: 28 senior doctors, 6 junior doctors and 10 senior nurses.
– The study was undertaken over six weeks in May and June 2017 with the analysis of the results completed in July 2017.

95%

of the clinical team relied on typing or pen and paper

32%

of clinicians cited delays of one or two days in notes reaching patient records

Results

Speech recognition is the preferred method for capturing patient notes in the Emergency Department.
– At the time of completing the study, speech recognition is used by 69% of clinicians in See & Treat, 49% in Main and 31% in Resus (*N.B. the lower adoption in Main and Resus, in particular, are due to practical factors not wholly compatible with clinical process*).
– Typing is still used but handwriting and traditional dictation are no longer used.
– Most (67%) of clinicians believed patients had no concerns with their use of speech recognition.

Significant time savings
– Clinicians reported that it took less time to capture clinical documentation using speech recognition versus typing
– Creating a document using speech recognition was estimated by the clinicians to be up to 40% faster than handwriting or typing
– Time savings per patient were reported as 3.45 mins in Main, 3.68 mins in Resus and 0.2 mins in See & Treat. (*N.B. the key change in See & Treat was the removal of traditional dictation, so time-savings were not as evident*).
– Across the three clinical areas of Main, Resus and See & Treat the average time saving using speech recognition versus typing was almost 3 minutes per patient. When compared with handwriting or traditional dictation practices, this time saving was up to three and a half minutes per patient.
– Extrapolating the average time saving if all clinicians were to use speech recognition versus typing per patient in each area of ED by the corresponding number of patients per area per annum, then the total potential time saving would be the equivalent of freeing up 389 clinician days per annum or, in gaining almost two full-time ED clinicians.
– Reports of additional time savings in other clinical settings varied from 1 hour 18 minutes to 4 hours per clinician per week - emphasising the role speech recognition has played in freeing up vital time for clinicians in ED to treat patients. (*N.B. these time savings were reported by 9 out of the total of 44 clinicians participating in the survey and care with interpretation is required*).

Reducing delays and improving the flow of communication
– Clinicians also reported a perceived reduction in information-related delays across each of the three clinical areas in ED and that, due to the increased ease and speed of adding additional information to the patient record using speech recognition, patient reports were significantly more accurate.
– Asked in more detail about the perceived benefits of the real-time recording of notes enabled through speech recognition the top responses included:
  - improved information handling,
  - a reduction in information-related queries,
  - information being rapidly available to others and
  - a reduction in information-related queries with other departments.
– Clinicians indicated the benefits of using speech recognition not only in the core ED EPR but also in producing other clinical documents in other systems within ED including the diagnostics and order communications systems, letter communications with GPs and for general administration such as e-mails etc.

98%

clinicians reported that the speech recognition deployment in ED had a positive impact

Creating a document up to

40%

faster than handwriting or typing by using speech recognition

Reduction in information-related delays

Improving the quality of patient records

– 86% of clinicians reported their notes were more complete using speech recognition with nearly one in four (23%) believing their notes are now 'much' more complete. Because the time it now takes to create the clinical documentation is less, clinicians felt they were better able to produce more complete notes with the time they had.

– 88% of clinicians cited overall quality improvements with documentation following the implementation of Nuance Dragon Medical speech recognition.

– Clinicians were asked for their perceptions about the potential beneficial aspects of a more complete record. Amongst these were having information available:
  - to support effective and efficient care delivery
  - to support re-attendances
  - for subsequent patient queries
  - if needed for NHS complaints and legal defences

86%

of clinicians reported their notes were more complete using speech recognition

The majority (9 out of 10) of clinicians felt that using speech recognition compared to handwriting and typing saved time, improved the quality of the notes and increased the speed of communication with others.

3.5 min / patient

Time savings in documenting care in ED of up to three and a half minutes per patient.

389 clinician days/ annum

This time saving per patient could also be expressed as the equivalent of freeing up 389 clinician days per annum or in gaining nearly two full-time clinicians for the ED team

Most (67%) of clinicians believed patients had no concerns with their use of speech recognition

Conclusions and recommendations

Nuance Dragon Medical speech recognition integrated into the EPR has enabled and accelerated real-time, paperless clinical documentation within the Emergency Department

Following introduction of the EPR to digitise the patient record and enable paperless clinical documentation, speech recognition integrated into the EPR was deployed to ease and speed patient record capture. Once trained and familiar with the day-to-day use of clinical speech recognition as a way of capturing the structured and unstructured data within the EPR all clinicians reported the positive impact of the speech recognition deployment across ED in all three clinical areas of ED: Main, Resus and See & Treat.

Nuance Dragon Medical speech recognition has significantly reduced the burden of clinical documentation within the Emergency Department

Clinicians reported clear benefits with regard to time saving when creating clinical documentation, improved speed of internal communication and significantly more and better quality content within patient records.

The benefits of speech recognition are clear, but dedicated training must be in place to drive change on the ground

Clinicians cited early challenges in learning to use speech recognition within the EPR. Shifts, holidays and sickness must all be factored into the training schedule. After initial training of individuals, floor walking, super-user and refresher training must be put in place within the day to day of the department to provide users with on-the-job support, confidence, tips and tricks, short-cuts and macros etc. to ensure speech recognition is used to its full potential and delivers the organisation's goals.

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ignetica

Independent research consultancy, Ignetica, was engaged by Nuance to design and undertake the study to analyse the impact of speech recognition as described in this report.

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