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Case Study of Speech Recognition use at
Kings College Hospital Histopathology Department

Please note that this case study takes extracts from the full document, which is available upon request. As a result of this audit, Kings College Hospital have now deployed Dragon NaturallySpeaking throughout the Pathology and Radiology departments and are now seeking to implement this within other departments within the hospital.

1. Executive summary

This report presents the results from an audit of the benefits of the Voice Recognition (VR) pilot in the Department of Histopathology at Kings College Hospital. The Kings Histopathology department identified both new VR suppliers (who have resolved many of the previous problems linked to VR). This required a degree of risk taking. The Kings department remains convinced that VR significantly improves performance and is committed to full 'roll out' in due course.

This report sets out the findings of the audit that clearly indicates that turnaround times are greatly improved and significant secretarial time is saved. It also proves that the new VR technology not only works in this type of service setting, but will also add value to departments and functions that provide regular reports for requesting doctors.

Background

King's College Histopathology Department receives some 275 – 300 routine specimens a week. Each specimen requires a complex laboratory and administrative process before it is finally authorised for distribution. *(Appendix A)*. VR has its greatest impact on the administrative part of the overall process.

A weekly rota identifies a named Pathologist who will report on the specimen types. The routine surgical intake of specimens is covered by two Pathologists

and is shown on the rota as *'Odds and Evens'.* In addition, these two Pathologists will also report on their own sub-specialty. The audit has focused on the reporting of surgical specimens ie the *'Odds and Evens'* although it could have focused on sub-specialty interests too. This is because it is easier to compare the difference in turnaround time more equitably as the volume of work is comparable.

At Kings a report is dictated (or previously typed) onto a specific Laboratory Information Management System ie PathNet and then verified by the reporting Pathologist. On verification, this report is automatically transferred onto the Trust EPR system, where it is immediately available to all staff who can access EPR. Paper copies of the report are also dispatched to individual clinical requestors as a hard copy report held in the patient's notes remains a legal requirement. Over time, Kings intends to cease this dual process. In addition, a copy of each report is filed in the Histopathology Office.

3. Audit of turnaround times

3.1 Purpose

The purpose of the audit was to evaluate the impact of the pilot VR on turn around times and the use of secretarial resources.

3.2 Methodology

The three weeks that were selected from the rota co-incided with those weeks where the Pathologist trained to use VR covered *'Odds and Evens'.* The information from the copy report files, shows the date each specimen was received and the date of verification *(Appendix B)*

3.3 Findings

3.3.1 Impact on workload

The VR Pathologist reported on the highest number of cases over the three weeks

Week commencing	***VR Pathologist***	***Control Pathologist***
Mon 30 June 2003	86	44
Mon 21 July 2003	86	87
Mon 18 August 2003	100	30
TOTAL	272	161

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The figures above are just for the rostered surgical workload ie *'Odds and Evens'*, where it is normal for there to be some difference in the volumes reported by the duty consultant. This reflects the small variation in surgical cases, individual working practice, experience and the impact of other sub-specialty demands. Nevertheless one finding of this audit, (confirmed by the VR pathologist) was that because the VR process is slicker it did encourage and facilitate a greater productivity. (The conventional reporting process involves audio dictation to tape or long-hand transcription that is subsequently typed by secretarial staff, printed, checked and corrected for any mistakes, then finally verified by the reporting consultant).

3.3.2 Average number of days from receipt to verification

Week commencing:	*VR Pathologist*	*'Control' Pathologist*
Mon 30 June 2003	4.42	5.2
Mon 21 July 2003	3.9	8.3
Mon 18 August 2003	3.64	6.4

This date measures the whole process from specimen reception to report verification. The majority of the time taken for the VR Pathologist resulted from specimen preparation within the Histopathology laboratory. This was a common process for both the VR Pathologist and the 'Control' Pathologist. Therefore it is clear that the removal of a number of delaying steps within the administrative process enables the VR pathologist to half the turnaround time of the 'Control' Pathologist. VR removes several stages in the current process (*Appendix A.)*

Some variances do result from different preparation requirements but it is assumed that these equal out between the *'Odds and Evens'* over a normal week.

If just the administrative time is compared, the verification delay of the VR Pathologist was less than 1 day. Normally verification occurred for the VR Pathologist within an hour or two of the specimen being ready to report, compared to between 3-5 days for the 'Control' Pathologist.

3.3.3 Secretarial time

The Consultant undertaking the pilot confirmed that VR system clearly reduced pathologist use of secretarial time. Time to type up a dictated or handwritten one page report was assessed and averaged at approximately 10 minutes. (Conventional secretarial problems of deciphering handwritten reports, interpreting accents and typing unfamiliar medical terminology on audio dictation, is no longer an issue with VR). Using the VR system the following conclusions were made:

Week commencing	*Sec time saved by VR Pathologist per week*	*Sec time used by Pathologist per week*
Mon 30 June 2003	14 hours	7.3 hours
Mon 21 July 2003	14 hours	14 hours
Mon 18 August 2003	16.5 hours	5 hours

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Thus over a 3 week period the VR Pathologist has notionally released 44.5 secretarial hours.

The difference in time saved / used between the VR Pathologist and the 'Control' Pathologist reflects the variance in work undertaken.

Some caution is required when interpreting the notional time saved by the VR Pathologist as this amount of secretarial time was actually not available when needed. Thus some of the work would have had to wait in the queue for typing.

Data analysis from the pilot confirms that VR appears to be making a major impact on workload in the Kings Histopathology office. Currently, there is no outstanding typing work, which was unprecedented before the introduction of VR. This is just the result from one consultant using VR.

On the basis of this audit it is believed that for each consultant fully utilising VR, 0.5 of a secretary could be saved. Thus in a department of eventually 10 Histopathology consultants this would equate to 5 secretaries and a combined saving on salaries of £110k. In practice however, the Histopathology department would not expect to remove this full amount. Currently the department is funded for 5 secretaries. In addition, they have other tasks to perform eg. MDM preparation and other administrative activities. Furthermore the typing workload severely limits the personal assistant support that can be offered by the secretarial team. Kings is affected by the national problem of recruiting and retaining high calibre consultant histopathologists, especially those with a teaching and research commitments and desires. In order to attract such high calibre Histopathologists to South East London they must be given the appropriate opportunity with regard to time and support that enables them to pursue their research and/or teaching interests. Therefore the release of some secretarial support time must be a key objective for the Histopathology department to aid this.

In addition once VR is fully 'rolled out' and functioning, the Kings department will be able to release 2 secretarial posts i.e £44k that will be offered as a cash releasing efficiency saving to the Trust. Given the current financial challenges within the Trust this is a far more effective way to reduce costs than to cut or limit services.

3.3.4 Report accuracy

VR reports are accurate as any corrections are immediately corrected by the Pathologist. Currently secretarial typing is delayed as a consequence of illegible handwriting or unclear tapes. After typing reports are printed given to Pathologists to check, sent back when amendments or corrections required, and printed again all resulting in delay and extra work for the pathologist. VR will not only remove the need for this process but save some paper costs too.

3.4 Additional points

It is clear that numerous variables and complexities make analysis of any work flow data of histopathology specimens difficult. For example delays in first steps of the process (ie. receipt and booking-in of specimens, initial entry onto PathNet etc.) all have a delayed *'knock on'* effect for turnaround times. Therefore departments seeking to copy the Kings department approach to VR would be advised to undertake an assessment of laboratory and other related processes too. The Kings Histopathology department has performed this in association with the Trust's own Modernisation Healthcare Team. This is

referenced in the final action plan that is attached as Appendix C. This approach further underpins the Kings commitment to modernisation and regular review of service delivery.

To note is that complex specimens require more laboratory and consultant reporting time. This is self evident to any staff member working within a Histopathology department, but needs to be understood by external reviewers.

It is also important to appreciate that reporting specimens are only part of a Histopathologist's workload. They are also involved in other duties that include 'cut up' (ie the preparation of and recording of samples), case presentation at weekly Multi-disciplinary meetings, undergraduate and postgraduate teaching, training junior staff, undertaking clinical audit, research etc. The VR application could easily assist with many of these tasks as it is not just a 'tool' for reporting.

Histopathologists are also frequently asked to urgently report on their sub-specialities or to give second opinions to colleagues, that can interrupt the reporting of surgical work i.e *'Odds and Evens'.* VR can once again help streamline these actions.

4. Feedback from Consultant using VR

Dr Jon Salisbury is the consultant at Kings using the VR system within the Department of Histopathology. Dr Salisbury is also the Clinical Director and the most experienced consultant within the current team; he can be contacted for further insight.

Dr Salisbury has stated that he now views the VR system as *'an invaluable resource that he would not now wish to work without'.*

It is clear and confirmed by Dr Salisbury that using VR takes marginally longer than dictating into a tape recorder. However the consultant makes back the time and more as there are no tapes to take to the secretaries nor any requirement to subsequently chase-up and/or amend any potential typing errors.

5. VR System supplier

The Histopathology VR system provider during the pilot is Hands Free Computing Ltd.

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5.1 Product performance

At the pilot outset, the key concern was whether the VR system would pick up the consultant voice accurately and quickly whilst also enabling them to dictate at normal speed. On these counts it has proven itself and thus is a significant improvement on previous systems. The system quickly 'learns' an individual accent and specific words dictated.

Problems encountered initially were with linking the VR system to the Kings Pathology Information system – PathNet. This is primarily because PathNet is 10 years old (DOS-based system) and in urgent need of replacement. However Hands Free Computing Ltd and the Kings Pathology IT team have managed to build a robust link that has functioned well. The PathNet – EPR link at Kings is also good (although on occasions EPR does go down). Nonetheless results remain available within the hospital where PathNet terminals exist even in these instances.

A number of more detailed IT issues were identified and subsequently resolved e.g the Trust's virus scanner caused some problems with the VR system until changes were made.
Background noise can impact on the system and VR dictating does need to be undertaken in a reasonably quiet environment. However Dr Jon Salisbury's office is affected by noise as directly outside, delivery lorries etc. arrive continuously throughout the day. On no occasions did any sort of background noise disrupt the VR dictation. Furthermore there is a facility where the microphone can be altered to reduce background noise.

5.2 Service / maintenance response

Hands Free Computing Ltd have responded quickly and positively to any problems encountered. When Kings requested that a particular service engineer be changed this was done. A Service desk also offers remote support to the user.

5.3 'Time to learn'

Consultant Histopathologists in the vast majority of units will be extremely busy and finding time to learn how to use VR was an initial concern. Dr Salisbury however has indicated that while it did take a couple of hours initially to learn how to use the system and programme the 'voice', it did not take as long as originally expected. Obviously with time a consultant becomes more familiar with the system and hence far quicker in using it but units will need to allow for the fact that it may take some potential users longer than others to be effective.

Nonetheless the initial training time requirement is not seen as a major obstacle. It is clear that the initial time spent by the consultant 'training' the computer reaps dividends later.

6. Location

The VR systems are based in the individual consultant offices where they normally report. Other units would be in areas where surgical specimens are dealt with (cut-up rooms and multi-headed reporting rooms).

The system is software based and therefore simply 'loaded' onto the consultant's PC.

7. Multi-disciplinary Meetings (MDM)

Some MDMs are scheduled so that consultants have minimal time available for reporting between sample receipt and presentation. For example currently at Kings the Breast MDM is held on a Wednesday morning, just a day after receipt of the last biopsy samples that need to be discussed at the MDM. Due to such a tight timeframe, consultants have no option but to prepare for the meeting and take some of their results to the MDMs without entering all results onto PathNet and thus EPR. Subsequent to the MDMs, any outstanding results are confirmed and entered onto PathNet/EPR. Therefore the additional benefit of VR dictation should enable them to be reported and be available prior to discussion at the MDM.

For those consultants with a little more time to prepare, VR does offer a greater opportunity for the results being electronically available in advance. Nonetheless at MDMs results are always discussed and re-confirmed as the histopathological diagnosis directly affects patient management.

Thus the benefit of VR to MDMs is more indirect in that it has the potential to release administrative time to assist consultants with MDM preparation. Histopathology departments have been experiencing a rapid growth in requirements for attendance and presentation at MDMs that is an essential component of clinical governance. In most instances this growth has not been financially recognised but VR offers a process improvement that can assist with managing this growth.

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