Speech Recognition Aids
Faster Access to Clinical Information
Nick van Terheyden, MD – Chief Medical Officer, Philips Speech Recognition Systems
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Physician’s Nightmare

• Mountains of paperwork
• Patients in need of attention

• Mountains of paperwork
• Clinical staff in need of answers

• Mountains of paperwork
• Personal need for rest, family time and reflection to be a better practitioner
Complex process of caring for patients

- Clinical documentation comprises the essential building blocks for all healthcare processes
- Obtaining a history
- Performing a physical examination
- Ordering tests and evaluating their results
- Establishing diagnoses
- Prescribing therapies and monitoring the course of treatment.

- Each step must be accurately and thoroughly documented
My Dream

One step process to document patient care accurately

• Ability to focus on patient care
• Allow me to discuss, respond and instruct the clinical team appropriately
• Facilitate personal needs for R&R
Health Data Management 2003 CIO Survey

When doctors and nurses at your organization express dissatisfaction with internal services, which ONE of the following is their most frequently expressed concern?

- Long working hours: 0.6
- Dissatisfaction with IT structure: 0.5
- Too much paperwork: 0.4
- Difficulty maintaining patient satisfaction levels: 0.3
- Lost income due to claims: 0.2

59% of respondents expressed the concern of Long working hours.
HIMSS 2005 Survey

Technology Adoption in the next two Years

- Handheld PDAs: 53% (2004), 59% (2005)
- Bar Code Technology: 54% (2004), 59% (2005)
- Speech Recognition: 53% (2004), 59% (2005)
- Automated Alerts to Clinicians: 51% (2004), 57% (2005)
- Data Warehouse: 37% (2004), 51% (2005)
- Wireless Information Appliances: 47% (2004), 51% (2005)
- Extranet: 37% (2004), 50% (2005)
- Data Security Technologies: 40% (2004), 45% (2005)
Volume and Complexity Increasing

- Tremendous increase in volume and complexity of studies in the US during the past several years
  - “2005-2010 workload to increase 50% for Radiologists” James Thrall, Mass. General Hospital, Boston
  - Rick Marin, Mayo Clinic Jacksonville, FL
  - 2002 16,000 CT images/day (2 sec/image)
  - 2006 80,000 CT images/day (0.45 sec/image)

- In the Next 10 years we will learn/develop more medical information than we have captured in the whole of medical history
Documentation Needs to Support the Right Clinical Decisions

• Clinical medicine is inherently challenging
  – Complexity of the human body
  – How it responds to disease

• Our understanding of illnesses and optimal treatment is continually changing

• AND doing so faster than ever

• Clinical decisions are fundamentally considered judgments
Physicians Are the Drivers

• Only physicians can document diagnosis and procedures
• Possible to document the clinical course, but
  – Fail to provide accurate, specific documentation
  – Complexity, co-morbidity, complications
• Diagnosis and Procedures are required for reimbursement of care delivered
Speech Recognition: Where are We and Where are we Going

The evolution of automated document creation

Ease of Use

Free Form Dictation

Interactive

Intelligent Speech Interpretation

Continuous SR

(Discrete SR)


Time
Clatterbridge Center for Oncology (CCO)

- One of the largest cancer treatment facilities in the United Kingdom
- Diagnostic Imaging – 19,000 exams per year
  - X-Ray
  - Ultrasound
  - CT
  - Nuclear Medicine
  - MRI
- Target of Report Available within 24 hours
Report Card For CCO

• 1 in 4 MRI’s met deadline – available within 24 hours
• Total of 11% of imaging reports available within 24 hours
• Frustrated Users
• Frustrated Referring Physicians
• Frustrated patients
### Availability of medical reports within 24hrs

<table>
<thead>
<tr>
<th>Report type</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>41%</td>
</tr>
<tr>
<td>MRI</td>
<td>25%</td>
</tr>
<tr>
<td>Nuclear Medicine</td>
<td>43%</td>
</tr>
<tr>
<td>X-Ray</td>
<td>11%</td>
</tr>
</tbody>
</table>
## Availability of medical reports within 24hrs

<table>
<thead>
<tr>
<th>Report type</th>
<th>2003</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>41%</td>
<td>86%</td>
</tr>
<tr>
<td>MRI</td>
<td>25%</td>
<td>76%</td>
</tr>
<tr>
<td>Nuclear Medicine</td>
<td>43%</td>
<td>72%</td>
</tr>
<tr>
<td>X-Ray</td>
<td>11%</td>
<td>80%</td>
</tr>
</tbody>
</table>
Other Benefits

Improved Data security

- No stray tapes to lose
- Imaging reports recorded directly into patient record

No misfiling

- Report demographics data tied directly at the time of report dictation
- Instant report retrieval

“Speech recognition didn’t change my working procedure. What it did change though is report turnaround.”

Dr. Keith Grant
Clinical Director of Diagnostic Imaging
Resistance

• Secretarial Support – potential job cuts
• Physician resistance to change
  – Providing a practice environment
• Technology mistrust – there was something secure in being able to hold onto a physical tape of a report
• Rotating Staff – enrollment and training time
• Variation in Phrases
• Redundant Re-Working
Report Standardization

<table>
<thead>
<tr>
<th>Dictated Words</th>
<th>Heading per departmental guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>To Conclude</td>
<td>Conclusion</td>
</tr>
<tr>
<td>CT Scan of the abdomen prone IV</td>
<td>CT Abdomen (prone + IV)</td>
</tr>
<tr>
<td>Dynamic CT Scan</td>
<td>CT Dynamic</td>
</tr>
<tr>
<td>CT Scan of the neck, chest and liver</td>
<td>CT Neck, Chest, Liver</td>
</tr>
<tr>
<td>CT scan of the chest with intervenous contrast</td>
<td>CT Chest (with IV contrast)</td>
</tr>
</tbody>
</table>

“Our dedication paid off quickly, as the system now not only recognizes words but interprets them according to our clinic’s guidelines.“

Anne-Marie Aspinal
Clinical EPR Trainer
## Understanding more...
### Intelligent Speech Interpretation

<table>
<thead>
<tr>
<th></th>
<th>Dictated Text</th>
<th>Recognized Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redundant phrases</td>
<td>Send copy of report to</td>
<td>Does not appear in final document.</td>
</tr>
<tr>
<td>Section headings</td>
<td>Condition on/at/upon/of/ discharge</td>
<td>Condition on Discharge</td>
</tr>
<tr>
<td></td>
<td>Next is condition...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Next section is condition..</td>
<td></td>
</tr>
<tr>
<td>Dates</td>
<td>Fifth of May five two thousand two</td>
<td>5 May 2006</td>
</tr>
<tr>
<td></td>
<td>May fifth two thousand six...</td>
<td></td>
</tr>
<tr>
<td>Automatic punctuation</td>
<td>No chills fevers night sweats weight loss...</td>
<td>No chills, fevers, night sweats, weight loss...</td>
</tr>
<tr>
<td>Silences/pauses</td>
<td>There has not been (------pause----) much change...</td>
<td>There has not been much change.</td>
</tr>
<tr>
<td>Non-speech dictation</td>
<td>There has not been (paper rustling) much change...</td>
<td>There has not been much change...</td>
</tr>
<tr>
<td>Hesitations</td>
<td>There has not been (AAHHMMMMMM) much...</td>
<td>There has not been much...</td>
</tr>
<tr>
<td>Contraction</td>
<td>There hasn't been</td>
<td>There has not been</td>
</tr>
<tr>
<td>Orthographic variants</td>
<td>She is here today because she has a letter from her (GP) resident from the university...</td>
<td>She is here today because she has a letter from her GP or General Practitioner or Family Practitioner (customizable) …</td>
</tr>
</tbody>
</table>
Critical Success Factors

• Accept resistance to change and work with clinicians to overcome using multiple approaches
  – Physician champions
  – Test environment
  – Capability to move from front end to back end seamlessly

• Start with the low hanging fruit
  – Implement back end which requires minimal change in behavior
  – Leave option available to move to front end when the time is right

• Integrate the technology into the Picture Archiving Communication System (PACS) or Radiology Information System (RIS)
  – Islands of technology create support nightmares
Speech Recognitions Impact to Medical Documentation

• Speech recognition can reduce costs by 30-40%  
• Early users will have high competitive advantage  
• Question is not if, but when you should use Speech Recognition
So What Does the Future Hold

• Medical Technology is fragmented and increasingly complex
• There are many developments on the Horizon
• Many inputs to the medical record
• Massive Legacy investments that institutions and individuals are either unwilling or unable to migrate

• It is not going to get any Easier!
Conclusion

• To achieve our goals
  – Capture the data at source to feed the EMR
  – Support clinical decision making with complete codifiable data
  – Error reporting needs to become error catching

• Speech is the most natural form of communication

• Speech Recognition bridges the gap between clinicians and technology

• SpeechMagic no longer “nice to have” this is a “must have technology”
http://www.philips.com/speechrecognition

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