"Innovation through Knowledge Transfer 2009"

Research With Impact

"Integrated Care e-Pathways (eICPs) for patients undergoing elective hip and knee replacements"

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Knowledge Transfer Partnerships

MOHAMMED RIZWAN

Integrated Care e-Pathway Designer

North Tees and Hartlepool NHS Foundation Trust

North Tees & Hartlepool NHS Foundation Trust, United Kingdom

Health Information Department, Hartlepool

Durham University

KTP Associate, Durham University, United Kingdom

Wolfson Research Institute, School of Medicine & Health, Stockton On Tees

about myself …

"I think from Clinician's point of view when delivering IT in Healthcare"

- **Clinical Perfusionist** with an experience of **450** adult and paediatric open heart surgeries; and also worked as **TEACHING ASSISTANT**

- **MSc in Health Informatics** (University of Salford), Manchester, UK. Worked on *NHS dm+d dictionary (Research)*

- **Healthcare Informaticist** (*First Data Bank Europe*): Designed EHRs involving CDS; Clinical Terminologies (Read codes, SNOMED CT etc.,)

- Currently pursuing **PhD** from Durham University

- And **Diploma in Management** from Chartered Management Institute, Oxford

Background

- **Durham University** (*University of the Year, 2005*)
  - *Durham & Stockton On Tees*
  - Durham University has won praise for the international quality of its research according to a new national assessment of UK universities (18 Dec 2008)

- **North Tees & Hartlepool NHS Foundation Trust** *(Orthopaedics)*
  - *Hartlepool & Stockton On Tees*

OBJECTIVE OF THE PILOT STUDY

Re-engineer the data capture and analysis of process of orthopaedic patients involving multidisciplinary & cross-departmental healthcare records towards a unified Integrated Care Pathway information system.

Integrated Care Pathway

HISTORY

Introduced in the late 1980s in UK as a ***Quality Tool***
but in USA as Cost Containment tool

DEFINITION

"An Integrated Care Pathway is a method for the patient care management of a well defined group of patients during a well defined period of time"

De Bleser et al **(2006)**

Plan

- 1. Introduction to Integrated Care e-Pathways – Action Plan Proposal

- 2. It includes interaction with multi disciplinary team and project team; understanding of data confidentiality and data protection; working (training) on project relevant softwares like formic fusion, SQL server, Biztalk etc; Discussion on national IT developments in the NHS, particularly NPfIT and CfH and understanding the need for compatibility with these at a local level. KPIs are recognized. Literature search is also initiated. Current pathways are replaced by mapping processes using Microsoft Visio.

- 3. Survey use of and attitudes to the existing ICPs for hip and knee replacements - ICP users (staff) are surveyed by questionnaires / structured interviews to assess their attitude for potential analysis on formic fusion. They are also influenced in such a way (either by online sessions or videos) that they will adapt themselves to culture change of new technology.

- 4. Survey use of and attitudes to using IT for near patient data collection

Continued…

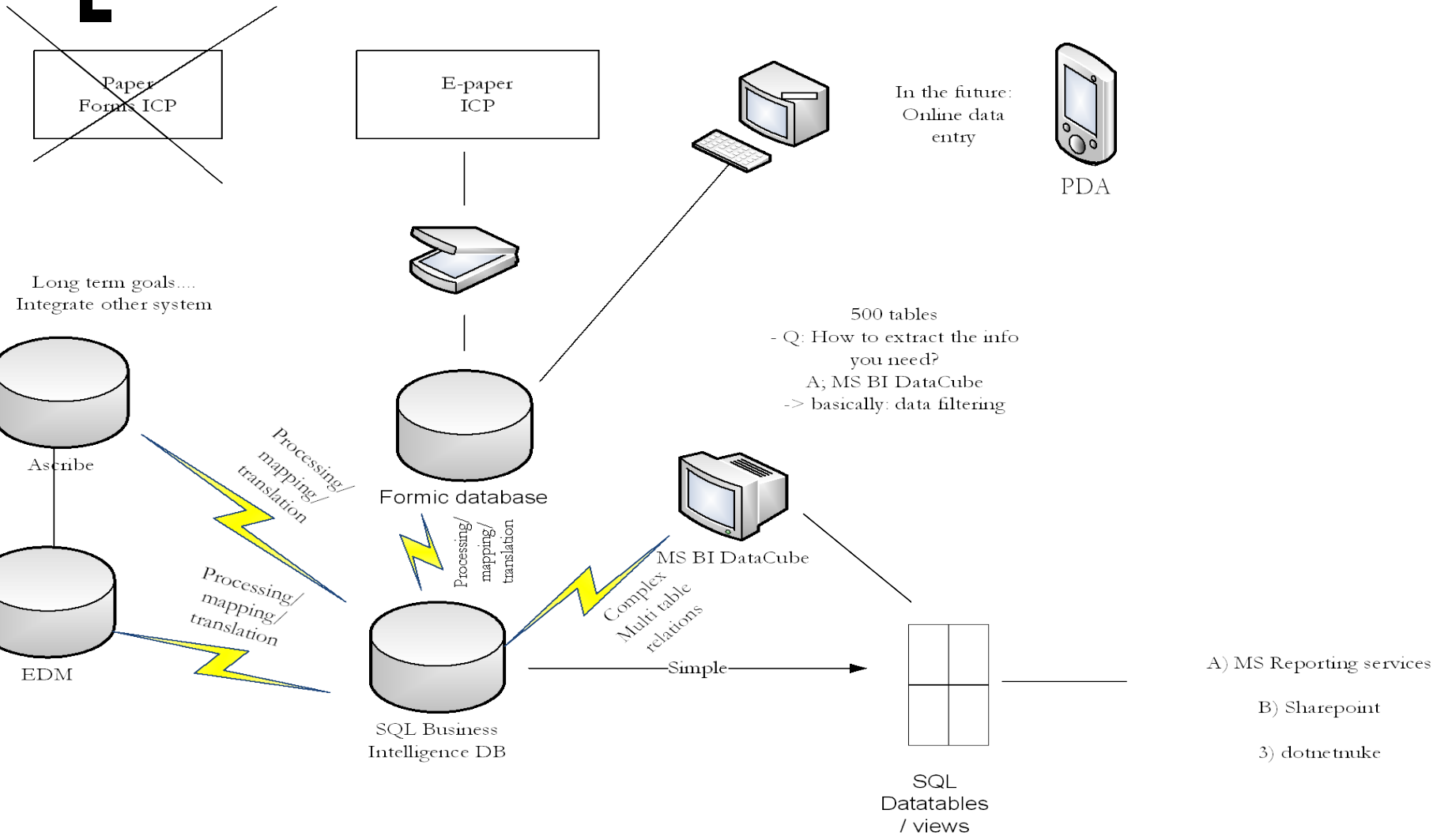
- 5. Review current ICP and re-design - The aim here is to reduce the size of the ICP to essential or critical fields which are more likely to be completed in full. Data-sets of integrated clinical pathways are revised and superfluous fields removed, core data availability identified, future data and reporting requirements identified, SPC (Statistical Process Control) methods identified. A detailed research is conducted on Lean Management as this forms one of the components of the proposed ICP project.

- 6. Develop, pilot and roll out a paper based data collection system - Paper forms (for hips & knees) are created on formic for electronic data capture and a standardized scanning process is implemented. Briefing materials on the paper-based system for use with the multidisciplinary team are developed. Slowly the staff are influenced to use online forms (RIWS, Videos etc.,).

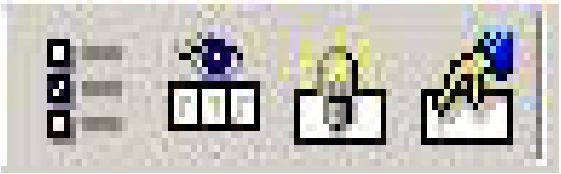
- 7. Develop and test the central database and exchange issues with existing data sources – Develop and test the central database and exchange issues with existing data sources – By now database should have been ready. So, database protocols are created, database tested, standard reports are created and online help system created. KPI dashboards (Data mining techniques, MS Sharepoint, reporting services etc,) will be deployed at this stage.

- 8. Roll out electronic data capture, reporting and use of the database - Test data input using electronic forms on the agreed input devices (*personal digital assistant*). Errors are recognized and rectified. Training materials will be developed and also team will be trained on electronic data capture.

Diagrammatic Representation



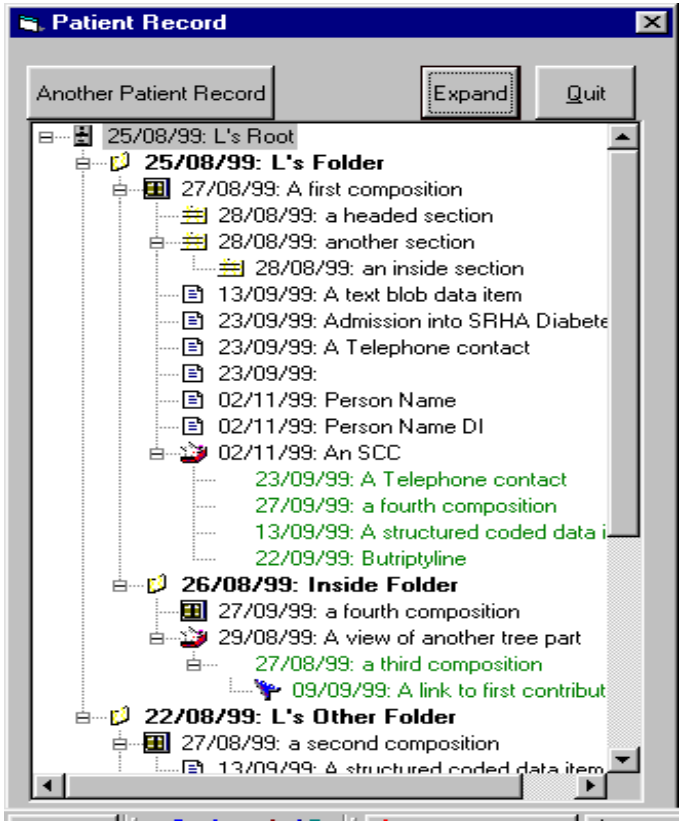
Data Capturing Objects - Formic



- Tick box Group
- Handwriting Recognition Object
- Manual Image Area
- 6 Automatic Image Area
  - Barcode recognition
  - Segmented Image
  - Area Character Recognition for capturing printed text
  - Presence Box
  - Gauge
  - Analogue Clock

A Picture's worth 1000 words……

Vs



Savings – Clinical Audit

	NET PROFIT BEFORE TAX (£)			
	During Project	1 yr after completion	2 yrs after completion	3 yrs after completion
Savings on Clinical Audits X 2	78,710			
Ongoing savings on Clinical Audits in Orthopaedics		157,420	196,775	236,130
Efficiencies in data inputting through scanning paper forms	900	900	900	900
Savings on data inputting to NJR	11,065	11,397	11,739	12,091
TOTAL	**90,675**	**169,717**	**209,414**	**249,121**

Theme

1. Clinical Decision Support
2. Interoperability
3. Potential to be incorporated into EHR or form EHR

- *Local ------- eICPs to EHR*

Approach: Step by Step

RESERACH QUESTIONS

1. **Re-engineering /Designing new electronic pathways (eICPs) by removing paper based ICPs for elective Hip and Knee replacements**
   - Removing paper based system (formic forms to online/fully electronic)
   - Designing new eICPs using Formic fusion
   - Pilot the new eICPs after approval

Continued...

2. **To study the staff attitude towards electronic data capture at the point of care; & to study the perceptions of Service Users towards electronic patient records**
   - Research Methods: Focus Groups and Interviews
   - Participants: Service Users and Staff
   - Ethical Approval – School of Medicine and Health; Trust R&D Peer Review; & National NHS Ethics
   - Jan-July 2009

Continued…

3. To conduct Service Evaluation of Virtual Review Clinics (VRCs)

- Research Method: Standard Questionnaires

Continued...

4. **To measure variance in patient pathway related parameters of a process through the method of statistical process control and generate relevant reports using reporting services**
   - SPC as tool
   - Aggregated patient data and not individual patients
   - Variance control/ no Audit

NETS

- Problem: *muda*
- Solution: *Lean;* Because "*Lean is lean*"

- Problem: 7 Wastes *(Motion, Defects, Transportation, Inventory, Overproduction, Time, Processing)*
- Solution: 5S *(Sort, Simplify, Sweep, Standardize, Self Discipline)*

- Biggest Challenge: *Culture Change*

- Lean, RIWS and eICPs

Comparative Study

- FORMIC Vs Map of Medicine (MoM)
- eICP Vs EHR

ISSUES

- Data Confidentiality and Security
- Interoperability

PROS & CONS

BENEFITS

- A new coherent, integrated medical electronic record of the entire treatment pathway based on a new scan-able paper based form & an exactly mirrored web-based electronic form. Acceptance of this by staff will be a major culture change for the Trust
- Improved and shorter treatments for patients due to complete medical records being available and automated analysis for all clinical information.
- Improvement action plans based on a variety of electronic records as an ongoing process
- Phased introduction of efficient procedures and systems for monitoring care pathways starting with paper-based systems/scanning moving to direct input via new Web based Information and Communication Technology (ICT) systems as a matter of routine.
- There will be no need for an intensive preparation of audits – electronic records are available ad-hoc on request. Cost savings in audit processes can be achieved in real time
- Ability to demonstrate quality of care provision, including reducing waiting times, in an increasingly competitive market. This can be achieved by the *Pull* effect (lean principle), streamlining the process and reducing duplication of work.
- Change management and staff development of nurses as a catalyst for change leading to improved staff morale. This will be a challenge and a learning experience too.
- Closer links with the Wolfson Research Institute (Queen's campus) and the Business School (Durham campus) at Durham University; Peer Reviewed Publications
- This will also give an opportunity to set up similar pathways in other parts (trauma and spinal pathways) of the patient journey for any treatment within the current trust.

CONCLUSION

- *Rome was not built in a day*
- Lean: *Try and fail rather than not trying to explore new things (eg, Hope Hospital).*
  - Continuous Improvement *("Kaizen")* holds key.
- *Innovate or Die – Lord Ara Darzi (EHI,* 19 Jun 2009*)*

THANK YOU VERY MUCH

E-mail

- mohammed.rizwan@nth.nhs.uk
- mohammed.rizwan@durham.ac.uk