A CASE STUDY ON THE ADOPTION OF SNOMED CT WITHIN UNIVERSITY HOSPITALS OF MORECAMBE BAY (UHMB) IN THE UK

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Outline

- Organisations
  - HSCIC – UK National Release Centre
  - CSC
  - University Hospitals of Morecambe Bay (UHMB) NHS Foundation Trust

- SNOMED CT
  - NHS strategy
  - LORENZO implementation
  - UHMB adoption
Market shifts and technology trends demand fresh thinking. CSC helps clients capitalise on trends and anticipate what’s ahead. Our people help businesses, governments and communities solve their toughest challenges.
CSC serves public and private healthcare and life sciences clients all over the globe, helping them achieve their goals of maximising efficiency and effectiveness and improving health outcomes for patients and citizens.
Distinctive Vision for Healthcare and Life Sciences

**OUR VISION:**
CONNECT. CARE. COLLABORATE.

Building on our position as a leading healthcare systems integrator with a rich portfolio of intellectual property, we will offer innovation through the use of technology to enable Coordinated Care and help healthcare organisations to improve health outcomes.

**HEALTHCARE AND LIFE SCIENCES: MARKETS IN TRANSITION**

- **Cost pressures**
  - U.S. spend: 18% of GDP
  - ...and rising

- **Demographics**
  - Ageing populations
  - Emerging economies

- **Medical advances**
  - Genomics
  - Personalized medicine

- **Technology**
  - Ubiquitous patient access
  - Cloud
  - Big Data / Analytics

**WHY CSC:**
UNRIVALLED STRENGTHS

- **Market Position**
  - Market leader in multiple geographies segments.

- **Global Reach**
  - Seven regional business units spanning the globe.

- **Capabilities**
  - Broad range of technology-enabled solutions.

- **Software Portfolio**
  - Category leading products in Acute Care, Primary Care, Community Care, Medication Management, Laboratory, Radiology and Life Sciences.

**WHY NOW?**

- **Market Need**
  - Healthcare systems need to address spiralling costs, changing demographics, and new medical technologies.

- **Technology Maturity**
  - Technology can contribute in new ways.

Healthcare and Life Sciences are markets in transition. We help our clients use technology to respond to market dynamics and achieve their goals of maximising efficiency and effectiveness and improving health outcomes for patients and citizens.
## MARKET BACKGROUND
### COST PRESSURES, DEMOGRAPHICS AND MEDICAL ADVANCES

### UK and Ireland
- Leading provider of hospital PAS/EMR
- Strong position in departmental solutions (labs, radiology, maternity, medication, emergency room)
- Leading provider of ambulance management systems
- Established provider of primary care systems
- Established provider of outsourcing and BPS

### Central Europe
- **DACH**
  - Established provider of hospital PAS (Germany)
  - Established provider of departmental systems – labs, radiology (Germany)
  - Established provider of payer solutions (Austria)
- **Netherlands**
  - Established provider of hospital PAS/EMR
  - Established provider of primary care systems
  - Established provider of IT infrastructure

### North America
- Established provider of outsourcing and BPS
- Strong position in applications management and consulting services
- Established provider of payer solutions
- Emerging provider of cybersecurity services

### Asia Pacific
- **Australia / New Zealand**
  - Leading provider of hospital PAS/EMR
  - Leading provider of departmental systems – pharmacy, theatres, emergency
  - Leading position in Electronic Medication Management
  - Strong position in systems integration
- **Asia, Middle East and Africa**
  - Established provider of hospital PAS

### Nordics
- **Denmark**
  - Largest provider of healthcare IT – acute care, aged care, community care, labs, medication, payer
- **Sweden, Norway**
  - Emerging position in acute care, aged/social care, labs, payer.

### Southern Europe and Latin America
- **Iberia (Spain, Portugal)**
  - Established provider of primary care, acute care and laboratory systems.
- **Latin America (Mexico, Peru, Honduras, Ecuador, Panama, Dominican Republic)**
  - Emerging leader in coordinated care solutions bringing together acute and primary care.

### CSC STRATEGIC FOCUS
#### COORDINATED CARE
- Innovative IP supporting coordinated care
- Business Process Services
- Next-generation technology solutions
- Big Data / Analytics
- Cybersecurity

Our innovative software, combined with our leading next-generation technology capabilities, help our clients respond to the challenges of a healthcare system in transition.
### Geographical Locations

<table>
<thead>
<tr>
<th>Town</th>
<th>County</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lancaster</td>
<td>Lancashire</td>
<td>134,000</td>
</tr>
<tr>
<td>Barrow-in-Furness</td>
<td>Cumbria</td>
<td>59,256</td>
</tr>
<tr>
<td>Kendal</td>
<td>Cumbria</td>
<td>28,300</td>
</tr>
<tr>
<td>Morecambe</td>
<td>Lancashire</td>
<td>45,000</td>
</tr>
<tr>
<td>Ulverston</td>
<td>Cumbria</td>
<td>11,210</td>
</tr>
<tr>
<td>Grange-Over-Sands</td>
<td>Cumbria</td>
<td>4,000</td>
</tr>
<tr>
<td>Bowness-on-Windermere</td>
<td>Cumbria</td>
<td>8,400</td>
</tr>
</tbody>
</table>
Numbers

- Almost 1000 square miles of the most picturesque countryside in England
- 320k resident population
- 400k activity based population
- Local GPs have 98% of the population registered with them
- 95% of all patient activity at local Trust
- 3 acute hospital sites and 2 community treatment centres
- 12m visitors to the Lakes each year – more than twice the population of Scotland
Focus on Interoperability

Referral to occupational therapy service

Assessment of fitness for occupational therapy

Occupational therapy assessment

Liaising with multidisciplinary team

Agreeing on care plan

Occupational therapy

Multidisciplinary care conference

Occupational therapy education

Discharge from occupational therapy service

The care plan
- Keep the patient at the centre
- Support conformance with best practice
- Evaluate outcomes
- Drive the care process
- Work intelligently based on assessment findings
- Deliver data from the care process
Power of Information

Information Strategy:

3.58 At the moment different areas of the health and care system use different coding terminologies – this means that information cannot flow around the system well, and the way data and terminologies are described is often inconsistent. Reducing the number of inconsistent or incompatible terminologies from 2015 (via the ‘route map’) will allow better integration between systems and across health and social care, and better information to support care and improvement of care. In due course, for patient care purposes, all relevant systems should use the same terminology to exchange coded information; SNOMED CT, adapted to fit all necessary uses, is the appropriate terminology to base this on. Similarly, to allow drugs to be consistently referenced, systems will consistently use the electronic drugs dictionary (dm+d).

Action: The NHS Commissioning Board will lead and coordinate work on developing commissioning data sets (the main data collection from secondary care) to allow data returns in SNOMED CT from April 2014.

Information Standards Notice:
The standard applies to:

Healthcare professionals providing care to patients receiving NHS care in England. All NHS staff interacting with patients should use SNOMED CT to record and exchange coded clinical information. Other stakeholders who may be required to use SNOMED CT will include public health, social care, health related services delivered in the education sector, as well as the independent sector.

The standard may be used to support clinical management of the patient in the following ways:

- In messages that are used to transfer patient related data from one system to another.
- Patient Summaries including Discharge summary.
- Problem lists.
- Allergy Lists and Allergy Management.
- Clinical Documentation.
- Order Communication and Results reporting.
- Care Plans; in particular for clinical content that will be transferred between systems.
- Keyword lists for metadata in care pathways, research documents, evidence based content.

All relevant systems should use the same terminology to exchange coded information – SNOMED CT

Systems will consistently use the electronic drugs dictionary (dm+d)

The NHS Commissioning Board will ... allow data returns in SNOMED CT from April 2014
Recent Strategic Documents

The key standards to which local organisations should start to adhere are:

Semantic SNOMED CT

If we are to achieve a single reliable source of data for multiple purposes, record keeping and data definitions must be standardised, including the implementation of SNOMED Clinical Terms (systematically organised, computer processable collection of medical terms) on all clinical information systems.
HEALTHCARE GROUP

LORENZO IMPLEMENTATION
LORENZO

• LORENZO is CSC’s strategic next generation electronic patient record system

• Multi-professional multi-specialty multi-care setting

• Comprises both administrative and clinical functionality

• Deployed in UK and the Netherlands to date

• All structured patient clinical data underpinned by use of clinical terminologies
SNOMED CT in LORENZO

- First release of LORENZO targeted for NHS in England
- National Programme for Information Technology (NPfIT) in England stipulated use of SNOMED CT
- Hence SNOMED CT was chosen as clinical terminology for clinical data in LORENZO in NHS England
Where is SNOMED CT used in LORENZO?

- **Clinical statements**
  - Problems
    - Diagnosis / Symptom / Presenting complaint
  - Allergies
    - Drug allergy / Drug adverse reaction / Drug intolerance
    - Food allergy / Food adverse reaction / Food intolerance
    - Non-drug allergy / Non-drug adverse reaction / Non-drug intolerance
  - Procedures

- **Clinical noting**
  - Smart tags

- **Structured assessments (forms)**
  - Data items linked to SNOMED CT expressions

- **Medication management**
  - Drugs (through mapping to dm+d)
SNOMED CT Subsets

- A key underlying artefact within the LORENZO approach is the use of SNOMED CT subsets to constrain user search
- Subsets include concepts from UK Extension, but exclude non-current and veterinary concepts and some hierarchies
- Subsets are created for each clinical statement type i.e. diagnosis, drug allergy, etc.
- Subsets for allergies are derived from the national subsets created and maintained by HSCIC
- Same subsets are used by all the NHS Trusts using LORENZO
Searching for SNOMED CT Terms in LORENZO

- LORENZO supports five different ways of searching for SNOMED CT terms
  - Basic search
  - Advanced search
  - Favourites
  - Recently used
  - Frequently used
LORENZO SNOMED CT Basic Search

Search for: penicillin

Selected Term: [V]Personal history of penicillin allergy

1 - 10 of 137
LORENZO SNOMED CT Advanced Search

**Search Results:**
- Benzathine penicillin allergy
- Combined penicillin preparation
- Combined penicillin preparation adverse reaction
- Combined penicillin preparation allergy
- Extended spectrum penicillin
- Extended spectrum penicillin
- H/O: penicillin allergy
- Infection resistant to penicillin
- Intentional penicillin G poisoning
- **Natural penicillin**

**Parents:**
- Penicillin -class of antibiotic-

**Children:**
- Benzylpenicillin
- Phenoxyacetylethylpenicillin
LORENZO SNOMED CT Recently Used

- 3M Cavilon No Sting barrier film foam 3ml applicator 3345P (3M Health Care Ltd)
- 24 hour Bence-Jones screening test
- 2 way foley all silicone catheter female 16Ch 085016101 10ml balloon (L.In.C. (Leicester Integrated Clinical)
  [V]Screening for haemorrhagic fever
LORENZO SNOMED CT Frequently Used

- Allergic rhinitis due to pollen
- Febire agglutinins measurement
- FH: Hay fever
- H/O: Hay fever
- Hay asthma
- Hay fever - other allergen
- Hay fever - unspecified allergen
- Hay fever conjunctivitis
This is test the font size

This is to test the font size

She appeared well-developed and well nourished, and in mild distress. The only positive physical findings were limited to the abdomen and pelvis. Her abdomen was mildly distended, and it was tender, especially in the lower left quadrant. At pelvic examination examination her cervix was tender on motion, and the uterus was of normal size, retroverted, and somewhat fixed. There was a tender cystic mass about 4-5 cm in the left adnexa. Rectal examination was negative
LORENZO SNOMED CT Clinical Noting Smart Tags

Create note

This is test the font size

This is to test the font size

She appeared well-developed and well nourished and in mild distress. The only positive physical findings were limited to the abdomen and pelvis. Her abdomen was mildly distended, and it was tenderness was found on examination of her cervix. There was a tender cystic mass about 4 cm in size.
LORENZO SNOMED CT Forms Data Items

<table>
<thead>
<tr>
<th>Mobility</th>
<th>Getting Out and About</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility within the home</td>
<td>Independent</td>
</tr>
<tr>
<td>Getting in/out chair</td>
<td>Independent</td>
</tr>
<tr>
<td>Getting in/out bed</td>
<td>Independent</td>
</tr>
<tr>
<td>Managing stairs</td>
<td>Independent</td>
</tr>
<tr>
<td>Can you get to local shops and facilities?</td>
<td>Yes</td>
</tr>
<tr>
<td>Details</td>
<td>Other</td>
</tr>
<tr>
<td>How do you usually get to local shops and facilities</td>
<td>Other, please specify</td>
</tr>
</tbody>
</table>
LORENZO SNOMED CT to ICD/OPCS Mapping

Mr TRIAGE Third scenario 01-Jan-1980 33 Yrs Male SIA010044
Encounter Closed Emergency: 02-Aug-2013

Coding and Grouping

Quick links
- Coding history
- Clinical notes
- Documents
- Favourites
- Problems
- Procedures
- Results

Summary
Event: AE Departure, 02-Aug-2013, Melbourne Mark, Encounter: Emergency, 02-Aug-2013, Melbourne Mark, UHMB Triage Area

Procedure name
- Advice about treatment
- Nasal bones X-ray
- Removal of foreign body from skin

Performed by
- Melbourne Mark

Coding scheme and version
- SNOMED CT 20120401

Category
- Treatment

Code
- 0100068
- 01
- 08
- 222

Description
- Laceration Nose
- X-ray plain film
- Removal foreign body
- Guidance/advice only - verbal

Coding
- AEDIG 1.0
- AEINV 1.0
- AETRE 1.0

Location
- 0100068-Laceration Nose
- 01-X-ray plain film
- 08-Removal foreign body
- 222-Guidance/advice only - verbal

Remove
Pair
Associated codes
Record Problem
Record Procedure
Add to favourites
Group

On behalf of
Authorise all
Status
Pending coding

CSC
HEALTHCARE GROUP
UNIVERSITY HOSPITALS OF MORECAMBE BAY (UHMB) NHS FOUNDATION TRUST ADOPTION
single Patient Record (sPR)
Introduction and Context

• Longstanding patient record vision
• Strong Executive and Senior Clinical Leadership from the start
  – Full visibility at Trust Board
• Organisation transformational change project
• Long term investment – 10 years+ programme of work
• Strategic relationship with CSC
• Benefits being realised
  – Immediate Discharge Summary; Infection Prevention; Paperlight Outpatients, etc.
single Patient Record (sPR) Informatics Profile

- Substantive staff base of 75 WTE
- 6000 named users representing 3700 WTE
- 4000 trained users – smart cards issued
- Concurrent user base of 600 with 1500 unique logons per day
single Patient Record (sPR)
LORENZO Core Capability

- Clinical Documentation
  - Letters, notes and forms
- Care Management (PAS function)
  - ADTs
  - Access Planning
  - OP management
- Requesting and Resulting
- Emergency Care
- PACS viewing
- TTO prescribing
- Advanced Bed Management
- Maternity
Where is SNOMED CT used?

- **Data recording**
  - Problems
  - Allergies
  - Procedures

- **Care settings**
  - Inpatient
  - Outpatient

- **Business processes**
  - Discharge summary
  - Clinical noting
  - Admissions
Who uses SNOMED CT?

• Over 800 clinicians are using SNOMED CT for recording structured data at point of care
  – Out of total clinician community of 3500

• Introduced to clinicians as ‘structured terms’
How often do they use SNOMED CT?

- IDS go live
- TTO go live
- Paperlight start
How is SNOMED CT use facilitated?

• Every clinician is trained on how to find the SNOMED CT terms that they need to use
  – Training
  – Coaching
  – Shadowing by trainer
  – One-to-one

• Clinicians need to demonstrate competency before being allowed to access system

• New doctors must undergo training as part of their induction

• Training support available 24/7 during go live
Benefits

• Immediate Discharge Summary being populated with relevant structured data
• TTO prescribing supported by prescribing decision support
• Building rich structured patient record which will yield more benefits in the future

• HSCIC case study available at http://systems.hscic.gov.uk/data/uktc/snomed/training/mcmbaycs.pdf
• HSCIC eLearning ‘SNOMED CT in Action’ available at http://www.infostandards.org/learning/