ELECTRONIC HEALTH RECORDS – THE SOURCE OF LITTLE DATA FOR BIG DATA

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EHRs Objectives

- Reusability
  - Research - Knowledge acquisition & distribution
  - Service
  - Public health

- Direct patient care
  - Accurate record of meaning
  - Automated retrieval
    - Clinical decision support etc
To achieve this we need:

- Persistent queryable record structure
  - A standard approach
  - A common language
  - Ability to link data from different software applications
  - Data sharing and comparing
  - Ability to capture knowledge
  - Semantic interoperability
<table>
<thead>
<tr>
<th>Small</th>
<th>Big</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data represents meaning</td>
<td>Aggregated for a purpose</td>
</tr>
<tr>
<td>Individual system</td>
<td>Multiple small data</td>
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<tr>
<td>Singular</td>
<td>Applies rules</td>
</tr>
<tr>
<td>Specific</td>
<td>From multiple systems</td>
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<tr>
<td></td>
<td>Linked with other data</td>
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<tr>
<td></td>
<td>Uses mathematical modelling</td>
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<td>Accuracy is dependent on small data</td>
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</tbody>
</table>
ELECTRONIC HEALTH RECORD

Reference Model

Data Types

Constraint Models

Represents EHR structure/framework

Structure data referring to EHR structural components

Represent knowledge objects’ scope where standard terminology (small data) is bound to concepts contained within each model


**Record Structure – Example (ISO 13606)**

- Compositions (prescription, signed, dated....)
  - Elements (eg individual drug orders)
    - Individual data elements about the order
Constraint Models – ISO 13606

- Maximal set of data elements for a concept (knowledge object)
  - Eg: allergy
    - Risk assessment
    - Adverse event record
      - Date
      - Reaction
      - Reporter……..etc…..

- The specification of data types, terminology, definitions, rules (constraints on content) ....

- Selection of knowledge objects for use in implementation
  - GP may choose some of the maximal set while immunologist wants it all
**What do you get?**

- **Semantic interoperability!**
  - Consistent representation of every piece of small data
  - In every setting
  - Any application
  - Any healthcare domain
  - Enables accurate mathematical modelling
  - Retain meaning over time
  - Ability to integrate new knowledge without destroying the past
Future Directions

More rebels
Challenge for you:–

- Map or implement shared model
- Implement shared concept representation
- Collaborate
  - go to Clinical Knowledge Manager
REFERENCES

- OpenEHR - http://www.openehr.org/
- An open domain-driven platform for developing flexible e-health systems
- The openEHR Clinical Knowledge Manager (CKM) is an international, online clinical knowledge resource

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