USING EHRS TO ASSESS THE QUALITY OF CARE FOR PATIENTS WITH HEAD AND NECK TUMORS
Me...

- Patrick Lubbers, PDEng
- Clinical Informatics
- Eindhoven University of Technology
- Joined Netherlands Cancer Institute (NKI-AVL) in 2012
- Works as an Information Manager for both clinical as research projects
Presentation Outline

1. Introduction
2. How do we assess the quality of care?
3. To what extent is the information for QI available?
4. To what extent can we use existing building blocks?
5. Conclusions and next steps
Core problem

• Over 10 years of EHR development in hospitals
• But... information registered for patient care can NOT (always) be reused for other purposes, for example;
  – Extracting quality indicators
  – Transfer of patients to other institutions
  – Reimbursement
  – Epidemiology
  – Research
  – ....
Causes

- Goal specific (national) registrations (>100!!)
- Variations between hospitals in definitions used
- Variations within hospitals in definitions used
- Variations between (national) registrations in definitions used
- Gaps
- Overlaps in registrations (EHR and excel)
- Fragmented IT landscape
- ...
GAPS
OVERLAPS
INCONSISTENCIES

Registrations

Patient care 1

Patient care 2

Quality 1

Quality 2

Financial

Usage

Patient Care
Transfer of patients
Research
Management information
Quality indicators
Financial / reimbursement
Etc.
Initiative by

- NFU: the federation of University Medical Centers (8)
- Nictiz: national competence center for eHealth and interoperability

Program “Registration at the Source”

To improve the (current) situation
Long term goals

Register once, unambiguously, IN (or close to) primary care process

Primary clinical process

- Disease / problem specific information
- Generic information (core set)

Select, Aggregation, Derivation, etc.

Multiple Usage

Usage

- Patient Care
- Transfer of patients
- Research
- Management information
- Quality indicators
- Financial / reimbursement
- Etc.
Basic assumptions

• The information can be structured into a finite number of clinical building blocks:
  – As large as needed (complete clinical concepts, for example heart rate)
  – As small as possible (generic, re-usable in wide range of use cases/user stories)
• To achieve the primary goal generic and specific clinical building blocks will be necessary
• Usable for different purposes
Clinical Building Blocks (CBB)

Stable, re-usable clinical building blocks

User story 1: transfer of patient
User story 2: quality indicators
User story 3: Modeling EHR
Current coverage

Register once, unambiguously, IN (or close to) primary care process

Primary clinical process

Disease / problem specific information

Generic information (core set)

Selecti... 

Aggregation

Derivation etc..

Multiple Usage

Usage

Patient Care

Transfer of patients

Research

Management information

Quality indicators

Financial / reimbursement

Etc.
Playing fields

The proof of the pudding is in the eating;
Testing the theories and investigate if the current clinical building blocks are sufficient and usable in the head and neck cancer cure process

Focus on;
Quality indicators (QI)
Primary care process
1. Introduction
2. How do we assess the quality of care?
3. To what extent is the information for QI available?
4. To what extent can we use existing building blocks?
5. Conclusions and next steps
# How do we assess the quality of care?

<table>
<thead>
<tr>
<th>Area</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome indicators (n=3)</strong></td>
<td>% cancer recurrence within 5 years</td>
</tr>
<tr>
<td><strong>Diagnostic indicators (n=6)</strong></td>
<td>% patients discussed in MDT</td>
</tr>
<tr>
<td><strong>Treatment indicators (n=1)</strong></td>
<td>% patients seen by a dental team</td>
</tr>
<tr>
<td><strong>Follow-up indicators (n=2)</strong></td>
<td>% check thyroid function</td>
</tr>
<tr>
<td><strong>Coordination and organization (n=4)</strong></td>
<td>% start treatment within 28 days</td>
</tr>
</tbody>
</table>

Number of quality indicators
Medical Care = 16
Presentation Outline

1. Introduction
2. How do we assess the quality of care?
3. To what extent is the information for QI available?
4. To what extent can we use existing building blocks?
5. Conclusions and next steps
### Which variables are needed?

<table>
<thead>
<tr>
<th>Needed variables</th>
<th>e.g.</th>
</tr>
</thead>
<tbody>
<tr>
<td>General (n= 28)*</td>
<td>date of birth; smoker; social status</td>
</tr>
<tr>
<td>Surgical (n=7)</td>
<td>type of surgery; date of surgery</td>
</tr>
<tr>
<td>Radiotherapy (n= 7)</td>
<td>dosis; start</td>
</tr>
<tr>
<td>Chemotherapy (n= 7)</td>
<td>dosis; start</td>
</tr>
<tr>
<td>Follow-up (n=8)</td>
<td>dismissal; readmissions</td>
</tr>
<tr>
<td>Pathology report (n= 28)</td>
<td>tumor size; tumor classification</td>
</tr>
</tbody>
</table>

*Including casemix and identification*

<table>
<thead>
<tr>
<th>Number of indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical care = 16</td>
</tr>
</tbody>
</table>
Conducting interviews with head and neck specialists, paramedics and nurses in multiple head and neck cancer centers
1. Not registered at all
2. Registered in EHR in any way possible (including free text)
3. Structured registration in EHR (no free text)
4. Registered using terminology standards in EHR (SNOMED-CT, ICD-10)
Overall conclusion;

Analysis is still going on but the general conclusion is that most variables (that are needed) are registered but not in a structured and standardized way and not only in the EHRs (other clinical applications, human resource applications, etc.)
Presentation Outline

1. Introduction
2. How do we access the quality of care?
3. To what extent is the information for QI available?
4. To what extent can we use existing building blocks?
5. Conclusions and next steps
Multiple use of clinical building blocks

Care process

Quality indicators
<table>
<thead>
<tr>
<th>Informatie-element (mid-level)</th>
<th>Klinische bouwsteen beschikbaar?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voorgeschiedenis</td>
<td>Ja, OverdrachtProbleem</td>
</tr>
<tr>
<td>Anamnese – algemeen</td>
<td>Ja, OverdrachtProbleem</td>
</tr>
<tr>
<td>Anamnese – familie</td>
<td>Ja, OverdrachtFamilieanamnese</td>
</tr>
<tr>
<td>Anamnese – sociaal</td>
<td>Ja, OverdrachtWoonsituatie</td>
</tr>
<tr>
<td>Lichamelijk onderzoek – algemeen</td>
<td>Nee, maar in ontwikkeling</td>
</tr>
<tr>
<td>Lichamelijk onderzoek – gewicht</td>
<td>Ja, OverdrachtGewicht</td>
</tr>
<tr>
<td>Lichamelijk onderzoek – eetgewoonte</td>
<td>Nee, maar in ontwikkeling</td>
</tr>
<tr>
<td>Intoxicaties – alcohol</td>
<td>Ja, OverdrachtIntoxicatieAlcohol</td>
</tr>
<tr>
<td>Intoxicaties – drugs</td>
<td>Ja, OverdrachtDrugsgebruik</td>
</tr>
<tr>
<td>Intoxicaties – roken</td>
<td>Ja, OverdrachtIntoxicatieTabak</td>
</tr>
<tr>
<td>Allergieën</td>
<td>Ja, OverdrachtAlert</td>
</tr>
<tr>
<td>Medicatie</td>
<td>Ja, OverdrachtMedicatie</td>
</tr>
<tr>
<td>Comorbiditeit</td>
<td>Ja, OverdrachtProbleem</td>
</tr>
<tr>
<td>Tumor</td>
<td>Nee</td>
</tr>
<tr>
<td>Metastasering</td>
<td>Nee</td>
</tr>
<tr>
<td>Behandeling</td>
<td>Ja, OverdrachtProcedure</td>
</tr>
<tr>
<td>Complicaties</td>
<td>Ja, OverdrachtProbleem</td>
</tr>
<tr>
<td>Toxiciteit</td>
<td>Nee</td>
</tr>
<tr>
<td>Pijnscore(VAS)</td>
<td>Ja, OverdrachtPijnscore</td>
</tr>
<tr>
<td>Lab bepalingen</td>
<td>Ja, OverdrachtLabUitslag</td>
</tr>
<tr>
<td>MDO</td>
<td>Nee</td>
</tr>
</tbody>
</table>
Results of analysis clinical process;

1. Directly useful (e.g. clinical building block Weight)
2. Useful with slight modifications (e.g. clinical building block Plan of Care)
3. No clinical building block available (e.g. tumor, MDT, toxicities)

Process information is (very) difficult to incorporate in clinical building clocks, yet it is essential part of quality indicators
Presentation Outline

1. Introduction
2. How do we access the quality of care?
3. To what extent is the information for QI available?
4. To what extent can we use existing building blocks?
5. Conclusions and next steps
Recap

Using EHRs to assess the quality of care for patients with head and neck tumors

Therefore...

✓ We developed quality indicators;
✓ We verified if the variables and information elements needed to measure the quality indicators were available;
✓ We checked if we could use the already existing clinical building blocks.
Conclusions

• Quality indicators need far more information elements than that are necessary for the clinical process;

• Most of the information elements (or variables) needed for quality indicators in EHRs are unstructured and not standardized (e.g. no use of Snomed CT, ICD-10);

• Standardized registration within the primary clinical process needs to be improved (garbage in, garbage out);
Next steps

• New developments for clinical building blocks:
  – By modifying existing clinical building blocks
  – By creating completely new clinical building blocks (e.g. tumor, multi disciplinary team)

• The proof of the pudding; using the technology to extract information elements directly from the EHRs

• Process evaluation of the usefulness of the clinical building blocks in general
More information?

www.nfu.nl
www.nictiz.nl