Information Systems for Administration, Clinical Documentation and Quality Assurance in an Austrian Disease Management Programme

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Agenda

- What is Disease Management?
- How can it be supported by Information Technology?
- How was it implemented in Austria?
- Discussion
What is Disease Management?

Disease management consists of a group of coherent interventions designed to prevent or manage one or more chronic conditions using a systematic, multidisciplinary approach and potentially employing multiple treatment modalities.

The goal of disease management is to

- identify persons at risk for one or more chronic conditions  
  Population, Registries
- promote self management by patients  
  Empowerment
- address the illnesses or conditions with maximum clinical outcome, effectiveness and efficiency regardless of treatment setting(s) or typical reimbursement patterns  
  Quality improvement, Integrated Care
Why Diabetes mellitus?

- Chronic Disease → complex management over long period of time
- Prevalence 5.9 % in Austria
- Complications associated with the disease
  - Coronary Heart Disease → Myocardial Infarction
  - Stroke,
  - Diabetic Foot Syndrome → Amputations,
  - Kidney Disease → Kidney Failure,
  - Retinal Disease → Blindness
- Impaired quality of life of patients
- Considerable costs for the health system

Structured treatment approach is suitable for Diabetes mellitus
- Course of the disease can be directly influenced by adequate adjustment of metabolic control
- Different options for therapy and diagnosis and high variability in quality of care
- Evidence-based guidelines exist
Disease Management Implementation by the Austrian Social Insurance

- **Central aims**
  - improvements in length and quality of life,
  - avoidance of late complications (associated reduced in-patient stays)

- **Programme description** (according to Krumholz, 2006)
  - **Population:** Patients with Type 2 Diabetes mellitus (others may follow)
  - **Recipients:** Interventions for patients and caregivers
  - **Delivery personnel:** Physicians, diabetes nurses
  - **Method of communication:** face-to-face individual or group, letters
  - **Intensity and complexity:** long term therapy approach
    - Multifaceted intervention
    - Diabetes education mandatory (4 days)
    - Quarterly GP visits
    - Annual comprehensive check-up and (electronic) documentation
  - **Environment:** Outpatient, GP

“Active therapy diabetes under control”
Components of the Austrian DMP

- Population Identification
- Evidence Based Practice Guidelines
- Collaborative practice model
- Reporting & Feedback loop
- Evaluation
- Patient Empowerment
- Clinician Education and Training

Practice Organization, Care Delivery System
Quality Management, Documentation
Information Systems

## Evidence for Quality Improvement Interventions (Cochrane EPOC Taxonomy)

<table>
<thead>
<tr>
<th>Quality Improvement Strategy</th>
<th>No. of Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Changes</td>
<td>26</td>
</tr>
<tr>
<td>Case Management</td>
<td>26</td>
</tr>
<tr>
<td>Patient Reminders</td>
<td>14</td>
</tr>
<tr>
<td>Patient Education</td>
<td>38</td>
</tr>
<tr>
<td>Electronic Patient Registry</td>
<td>8</td>
</tr>
<tr>
<td>Clinician Education</td>
<td>20</td>
</tr>
<tr>
<td>Facilitated Relay of Clinical Information</td>
<td>15</td>
</tr>
<tr>
<td>Self-Management</td>
<td>20</td>
</tr>
<tr>
<td>Audit and Feedback</td>
<td>9</td>
</tr>
<tr>
<td>Clinician Reminders</td>
<td>18</td>
</tr>
<tr>
<td>Continuous Quality Improvement</td>
<td>3</td>
</tr>
<tr>
<td>All Interventions</td>
<td>66</td>
</tr>
</tbody>
</table>

Shojania, 2006
## ICT support for DMP strategies in Austria I

<table>
<thead>
<tr>
<th>Population Management and administrative Panels</th>
<th>Implementation in Austria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Candidate IT Systems to support DMP</strong></td>
<td><strong>Implementation in Austria</strong></td>
</tr>
</tbody>
</table>
| Patient and Physician Panels: Identify and link patients and responsible providers | • Patient and physician enrollment and assignment of patients to physicians  
• Claims data used to identify population |
| Registries  
• Planning individual patient care  
• Performance of population-based care | • GP software has to care for patient data and provide function to identify patients with diabetes  
• Interactive patient lists available to physicians |
| Reporting and Feedback  
• Audit and feedback  
• Population reports | • Performance feedback with peer comparison to be discussed in quality circles |
| Comprehensive data pool:  
• aggregated, de-identified clinical, administrative and cost data  
• application of predictive modelling analytic tools | • De-identified data from clinical findings sheet and administrative data are used for program status reporting  
• Planned: Merging that data with social insurance claims data for cost analysis and long-term evaluation |
| Administration | • Administration of DMP properties  
• Custody of certificates and authorisations  
• Administration of patient education courses |
# ICT support for DMP strategies in Austria II

## Candidate IT Systems to support DMP

<table>
<thead>
<tr>
<th>Implementation in Austria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electronic documentation of DMP clinical data</strong></td>
</tr>
<tr>
<td>Yes, integrated in e-card infrastructure</td>
</tr>
</tbody>
</table>

## Connection with or part of electronic patient records

<table>
<thead>
<tr>
<th>Implementation in Austria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative functions available from EPR</strong></td>
</tr>
<tr>
<td>Yes, has to be implemented by GP software *)</td>
</tr>
<tr>
<td><strong>DMP clinical documentation available from EPR</strong></td>
</tr>
<tr>
<td>Yes, has to be implemented by GP software *)</td>
</tr>
</tbody>
</table>

## Reminders / Decision Support (directed to care providers)

<table>
<thead>
<tr>
<th>Implementation in Austria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Computerized prompts / Clinical Reminders</strong></td>
</tr>
<tr>
<td>Currently not planned</td>
</tr>
<tr>
<td><strong>Clinical Decision Support Systems</strong></td>
</tr>
<tr>
<td>Currently not planned</td>
</tr>
</tbody>
</table>

## Information / Education / Self-management promotion (directed to patients)

<table>
<thead>
<tr>
<th>Implementation in Austria</th>
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</thead>
<tbody>
<tr>
<td><strong>Static Web Site</strong></td>
</tr>
<tr>
<td><a href="http://diabetes.therapie-aktiv.at">http://diabetes.therapie-aktiv.at</a></td>
</tr>
<tr>
<td><strong>Patient Newsletter</strong></td>
</tr>
<tr>
<td>Email Newsletter</td>
</tr>
<tr>
<td><strong>Patient Recall</strong></td>
</tr>
<tr>
<td>Social insurance can inform patients with certain risk factors or remind of outstanding consultations</td>
</tr>
<tr>
<td><strong>Personal Health Records / Patient Portals</strong></td>
</tr>
<tr>
<td>Currently not planned</td>
</tr>
</tbody>
</table>

## Home Care / Telemedicine Interventions

<table>
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<th>Implementation in Austria</th>
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</thead>
<tbody>
<tr>
<td><strong>Telemonitoring, Home Care</strong></td>
</tr>
<tr>
<td>Currently not planned (Paper Diabetes diaries)</td>
</tr>
<tr>
<td><strong>Telemedicine patient encounters (&quot;virtual visits&quot;)</strong></td>
</tr>
<tr>
<td>Currently not planned</td>
</tr>
</tbody>
</table>

* ) communication with E-card infrastructure via Web Services
## Implementation of DMP strategies without ICT support in Austria

<table>
<thead>
<tr>
<th>DMP interventions</th>
<th>Implementation in Austria</th>
</tr>
</thead>
</table>
| Team Changes / Collaborative practice model | Patient education performed by diabetes nurses  
But no delegation of responsibility |
| Case Management                        | Currently not planned                                          |
| Patient self-management education      | Provided in groups, face-to-face, by diabetes nurse            |
| Clinician Education                    | Provided in face-to-face professional education sessions       |
| Evidence-based Guidelines              | Distributed on paper and in PDF format                        |
| Care delivery system modifications     | Minor modifications, additional fee for diabetes care introduced in fee-for-service environment |
Data Transmission:
- Administrative and Risk Data
- Clinical Data: Sign+Encrypt

Administrative + Risk Data

Data Repository

Physician Office

Health Information Network

DMP Medical Data Repository

SSN

Risk Data

Administrative Software

Clinical Data

Terminal

Browser

Stand-alone Client

Data Centre

Internet

Social Insurance online Portal

Putting Knowledge to Work
Software Engineering

- **Technologies**
  - Model Driven Architecture (AndroMDA)
  - J2EE (JBoss), Struts, Hibernate, Spring
  - Unit Tests (JUnit…) + Integration Tests

- **Backend Interfaces to Social Insurance Systems**
  - Social Insurance patient / provider registries
  - Authentication
  - e-card Infrastructure (data synchronisation)
  - Accounting
  - Social Insurance online portal
User Interfaces I
Programme Administration
User Interfaces II
Clinical Data Entry

UI generated by e-card Infrastructure in GP practice

Client for manual entry of paper forms by data centre
User Interfaces II
Digital Signature Transmission via Online Portal
User Interfaces – Discussion I

Integration of DMP functions in GP software required for optimal support

- Not all clinicians benefit from elaborate software
- Software adaptations have to be paid by GPs (causing higher total cost than with entirely centralised systems)
- DMP support functions in clinician software should be targeted in the future
- Accelerate paradigm shift → not only change from paper to electronic documentation but actually use the collected data in practice
Quality reports and feedback

BARS: Benchmarking and Reporting Service. A Web Based Tool for Quality Management in Diabetes Care

Proceedings of the 11th World Congress on Medical Informatics, 2004, 107, 1825. PMID: 15360653
Implementation Progress and Status

- **Progress**
  - 2004 … concept design
  - 2005 … negotiations and refinement
  - 2006 … implementation
  - 2007 … first patients registered
  - 2008 … electronic documentation operational

- **Status**
  - Implemented by 6/9 federal states
    (Lower Austria, Salzburg, Styria, Tyrol, Vorarlberg, Vienna)
  - Conversion planned for existing projects in 2 federal states
    (Upper Austria, Burgenland)

- **Enrolment (August 2009)**
  - 10,151 patients and 529 physicians enrolled
  - 3-4 % of the population with Type 2 Diabetes
  - 3.3 % of eligible physicians (Styria)

- **Evaluation**
  - Local RCT in Salzburg (not yet published)
  - Long term evaluation with outcome measures planned
Discussion II

- **Structured treatment approach for a chronic illness**
  - Available for the **first time** in this magnitude in Austria
  - Supported by a **standard IT infrastructure**, integrated in national e-health infrastructure
  - Considerable **harmonization efforts**!

- **Multifaceted intervention with relevant quality improvement strategies**
  - Room for improvement (Team Changes, Case Management, Physician Reminders / Clinical Decision Support)
  - Not all components are supported by IT (cost-effectiveness unclear)

- **Diabetes disease register established by central data collection**
  - Health status of patients with diabetes in Austria, international comparisons
  - Data for evaluation and quality assurance reports now available!

- **Additional (short term) incentives and (long term) health system changes required to support promotion of the programme**
Questions?

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