Cross-Institutional Pathway Guidance: chance or extra burden?

Thomas Bürkle, Michael Lehmann, Jürgen Holm, Murat Sariyar, Erwin Zetz, Kerstin Denecke

Healthcare of the Future, 5 April 2019
The clinical pathway exceeds one inpatient stay

Example hip surgery
▶ Elisabeth has more problems
▶ She sees her GP
▶ He asks for Xray
▶ Then he sends her to Orthopaedics
▶ The specialist confirms surgery
▶ She gets date for surgery
▶ She continues with reha centre
▶ She has PT at home
A topic visited several times
# Seminar work - requirements

16 persons aged 60-80 (convenience sample)

<table>
<thead>
<tr>
<th>Male</th>
<th>female</th>
<th>smartphone daily</th>
<th>smartphone weekly</th>
<th>smartphone monthly</th>
<th>smartphone rarely</th>
<th>no answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>N=16</td>
</tr>
<tr>
<td>14</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Seminar work - requirements

[Diagram with steps and checklists]

- In 3 Stunden
  - Termin Dr. Bürkle

- In 2 Tagen
  - Radiologie
  - Sektor B, Zi. 304
  - Röntgen

- Hüft-TEP
  - Durchführung
    - Der Patient wird mit Lagerungsmitteln in Seitenlage fixiert. Das zu operierende Bein wird in einem der Beinform angepassten Lagerungskissen gestützt und so abgedeckt, dass es während der Operation bewegt werden kann, um das Ergebnis der Operation zu kontrollieren. [...]  
  - Komplikationen und Risiken
    - Gefäß- und Nervenverletzungen (prädestiniert: N. ischiadicus u. N. femoralis)
    - Lockerung der Prothese (aseptisch) – Prothese sockt sich ohne Auftritt einer begleitenden infektiösen/entzündungshervorgerufenen beatmungsabhängige Schmerzen

[Checklist with items]
### Seminar work - requirements

**Do you think you could need a path app?**

<table>
<thead>
<tr>
<th></th>
<th>Yes, pretty much</th>
<th>Yes</th>
<th>Something is ok</th>
<th>Rather not desired</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>7</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Which function did you like/ would you use most?**

<table>
<thead>
<tr>
<th>Function</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal organizer</td>
<td>12</td>
</tr>
<tr>
<td>Reminder</td>
<td>3</td>
</tr>
<tr>
<td>Checklist</td>
<td>1</td>
</tr>
<tr>
<td>Information platform</td>
<td>0</td>
</tr>
<tr>
<td>Dialogue function</td>
<td>0</td>
</tr>
</tbody>
</table>
Seminar work - requirements

- Connection to GP system
- Connection to hospital system
- Connection to Reha center system
Three competing student groups
Apps for Tabs – How should it look like – 1st prototypes
10 Questions for the mockup, Likert with -2 = best

<table>
<thead>
<tr>
<th>Fragen</th>
<th>Mittelwerte</th>
</tr>
</thead>
<tbody>
<tr>
<td>Die Begriffe sind leserlich.</td>
<td>-1.5</td>
</tr>
<tr>
<td>Die Begriffe waren verständlich.</td>
<td>-1.33</td>
</tr>
<tr>
<td>Die Symbole (Icons) und Beschriftungen sind klar verständlich.</td>
<td>-1.66</td>
</tr>
<tr>
<td>Die App erleichtert es mir, meine Termine im Überblick zu behalten.</td>
<td>-1.5</td>
</tr>
<tr>
<td>Ich habe die Farbverteilung der Termine verstanden.</td>
<td>-1.16</td>
</tr>
<tr>
<td>Ich kann den Termin einfach in meine Agenda importieren.</td>
<td>-0.4</td>
</tr>
<tr>
<td>Ich kann die geführten Aufgaben in der Checkliste ankreuzen.</td>
<td>-1.5</td>
</tr>
<tr>
<td>Die Texteingabe ist einfach.</td>
<td>-1.66</td>
</tr>
<tr>
<td>Die App spricht meine Bedürfnisse als Benutzer/-in an.</td>
<td>-1</td>
</tr>
<tr>
<td>Die Benutzeroberfläche hat alle Funktionen, die ich brauche.</td>
<td>-1.33</td>
</tr>
<tr>
<td>Ich kann diese App problemlos ohne Systemhilfe verwenden.</td>
<td>-1.33</td>
</tr>
</tbody>
</table>
Lab prototype in the „Living Case“
Your treatment path:

- **Family Doctor Examination**
  Praxis Dr. Wenger
  17.10.2018 10:30

- **Consultation with the specialist**
  Klinik Höheweg
  22.10.2018 13:00

- **Hospital admission**
  Klinik Höheweg
  29.10.2018 15:30

- **Surgery - Hip TEP**
  Klinik Höheweg
  31.10.2018 07:15

6 days to the next appointment.

**Consultation with the specialist**
Klinik Höheweg
22.10.2018 13:00
Consultation with the specialist

First consultation with the specialist after assignment by the family doctor
Start date: 22.10.2018 13:00
End date: 22.10.2018 14:00

Practitioner
Role: Orthopäde
Name: Dr. med Christoph Jenni
Email:

Institution
Name: Klinik Höheweg
Adresse: Höheweg 80, 2502 Biel
Phone: 068 844 89 65

Reschedule appointment
Consultation with the specialist

First consultation with the specialist after assignment by the family doctor
Start date: 22.10.2018 13:00
End date: 22.10.2018 14:00

Practitioner
Role: Orthopäde
Name: Dr. med Christoph Jenni
Email:

Institution
Name: Klinik Höheweg
Address: Höheweg 80, 2502 Biel
Phone: 068 844 89 65

Rescheduling requested!
Date
2018-10-23

Time
13:30

Duration
60 min

Title
Consultation with the specialist

Description
First consultation with the specialist after assignment by the family doctor
Attention change of date!

The date of the appointment "Consultation with the specialist" has changed from 22.10.2018 13:00 to 23.10.2018 13:30.
Consultation with the specialist
Klinik Höheweg
23.10.2018 13:30
Current activities
Interfacing
Pathways – a success story?

Clinical Pathways inside institutions [1-4] have their proven merits, although one could ask the question, why they are not more widely used in inpatient care [13].

▶ See the talk of M. Sariyar at this conference
Discussion 1

- Elderly patients use modern information technology on a regular basis.
- They agree to use an app for trans-sectoral guidance through a healthcare episode.
- Competitive programming provided a minimalistic interface, which, according to potential users, was easy to use.
Discussion 2

- To avoid additional workload for healthcare professionals, the app must be interfaced with the clinical systems acting as the master for appointment data.

- The resulting system architecture was more complex than expected and requires a dedicated Path App Server.

- None of five different clinical information systems could be timely interfaced.
Discussion 3

▶ For interaction with the future Swiss Electronic Patient Dossier CDA formats for appointment data will be required.

▶ It remains open how often and which dates should be saved within the EPD

Exchanging Appointment Data Among Healthcare Institutions

Philip KÜBURZ1, Sascha GFELLER2, Thomas BÜRKLE1 and Kerstin DENECKE2

EM University of Applied Sciences, Biel, Switzerland

Abstract. The introduction of national electronic patient records such as the electronic patient dossier EPD in Switzerland provides a new basis for digitizing healthcare processes at a national level. One process however, that is currently neglected within the Swiss EPD, is the scheduling process in healthcare. The objective of this work is to analyze the appointment scheduling process and the involved IT systems in order to develop an appointment data structure and a concept for cross-institutional exchange of appointment data. The analysis showed that various outpatient and inpatient information systems support appointment booking through proprietary solutions. A future standard for appointment data exchange is missing. We suggest an appointment data structure and a corresponding data exchange process based on the FHIR standard. In its current implementation, the Swiss EPD does not support this proposed appointment scheduling process. We discuss how potential additions such as the IHE Care Services Discovery (CSD) profile can provide better compatibility.

Keywords. Appointment, Scheduling, Cross-institutional data exchange, FHIR

1. Introduction

Switzerland launches a national electronic patient record named electronic patient dossier (EPD) in 2020 [1]. The EPD supports document based, patient-related, cross-institutional data exchange based upon IHE (Integrating the Healthcare Enterprise) using profiles such as NDS (Cross-Enterprise Document Sharing) and XCA (Cross-Community Access) [2]. The EPD content will be a patient-related collection of CDA (Clinical Document Architecture) documents. For semantic interoperability, various