Patient Summaries in the Emergency Department

Catherine Chronaki
Secretary General

HL7 Foundation, Brussels, Belgium

Contact: euoffice@HL7.org

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HL7 Foundation: who we are..

- HL7 the best and most widely-used eHealth standards since 1986
  - HL7 v2, Clinical Document Architecture, HL7 FHIR
  - 19 National Affiliates in Europe (~38 worldwide)
  - European HL7 foundation established in 2010

- European Funded Research Projects
  - eHGI, Antilope, Semantic Healthnet, Trillium Bridge, Expand, Trillium-II
  - PHC34: ASSESS CT, OpenMedicine, eStandards

- Annual HL7 in Europe Newsletter
  - Website: www.HL7.eu

- eHealth policy & Research
  - eHealth stakeholders group; mHealth Guidelines; ENISA expert group
  - EFMI council (2012-): eHealth Week
  - EFMI Board (2016)
  - HIMSS Europe
  - SDO Joint Initiative Council
Objectives Trillium Bridge II (2017-2019)
Context, role, & adoption of international patient summary standards in the global eHealth ecosystem

- Establish a **Global Community of Practice** for Digital Health Innovation
- Highlight the **social value** of International Patient Summary standards
- Bridge patient summary initiatives and provide feedback to SDOs
- Contribute to International Patient Summary Standards **Governance**
- Develop, Collect, Assess **learning resources** for the Patient Summary
- Engage **mobile Health** companies & app developers with Patient summaries
- Foster innovation and inform health policy sharing **Patient Summaries**
Patient summary: operational?

- Listening to the patient and the family
  - **Quality assurance**: medication reconciliation
  - **Health goals**: tracking progress and identifying health trends
  - **Early warnings**: frailty in the elderly

- Navigating digital health data: portability, trust, and flow
  - Chronic disease management
  - Research networks: rare diseases
  - **Refugees** and **immigrants**
  - Medical Tourism

- Tracking the health needs in communities
  - Disaster and emergency response
  - Healthy communities

**Can we use patient summaries to unlock patient data?**

22 March 2018

Patient summaries in the Emergency Department
Patient summary as Health data navigator

Think of the Patient summary as a window to a person’s health or dashboard:
- Medications, allergies, vaccinations, problems and procedures,
- labs, diagnostic imaging, recent or planned encounters, implantable devices
- advance directives

“Bring the Power of Platforms to Health Care” using data to drive:
- administrative automation, networked knowledge, and resource orchestration [Bush & Fox, HBR November 2016]

eStandards need to
- help build trust
- unlock the power of health data
- facilitate decision support
- navigate the health system
Emergency department as decision environment

- High decision density
- Decision fatigue
- Throughput pressure
- Wide range of illnesses
- Diagnostic Uncertainly
- Narrow time windows
- Interruptions and distractions
- Shift work/sleep disruption
- Shift changes
  - cognitive decline at the end of a shift 30%

Diagnostic Error in ED
- Radiology 5%
- Missed injuries 12%
- Cardiovascular 19%
- Respiratory 30%
- Overall ~16%

It’s not about what we know, it’s about how we think!

Source: Dr. Pat Croskerry, Emergency London; https://www.youtube.com/watch?v=GFE6D54600E
International Patient Summary (IPS) Implementation Guide: Purpose & Scope

Goal: identify the required clinical data, vocabulary and value sets for an international patient summary.

Scope: “The IPS specification shall focus on a minimal and non-exhaustive Patient Summary, which is specialty-agnostic and condition-independent, but still clinically relevant.”

The primary use case is to provide support for cross-border or cross-jurisdictional emergency and unplanned care:

- Cross-jurisdictional patient summaries (through adaptation/extension for multi-language and realm scenarios, including translation).
- Emergency and unplanned care in any country, regardless of language.
- Value sets based on international vocabularies that are usable and understandable in any country.
- Data and metadata for document-level provenance.

Base Standards
Use Case based Standards Sets
Feedback and Maintenance
Forums and Monitoring
Live Deployment
Assurance and Testing
Tooling and Education
HL7 FHIR

Based on a set of modular components - "Resources"

- Resources refer to each other using URLs
- Small discrete units of exchange with defined behaviour and meaning
- Have known identity and behaviour
- Extensions permit adding data not part of core

Resources are combined into "Profiles" to solve clinical and administrative problems in a practical way.

- Parties exchanging data define the specific way they want to use resources and their relations using Profiles.
- Profiles are the framework for defining services.

Patient seeks unplanned care where another **language is spoken**.
Patient Summary Guideline

EU patient summary guideline defines patient summary as the “minimum set of information needed to assure healthcare coordination and continuity of care”

Emergency or unplanned care refers to “the range of healthcare services available to people who need medical advice, diagnosis and/or treatment quickly and unexpectedly”

Types of EHR summaries
- Emergency data set
- Continuity of care record
- Encounter report
- Discharge summary
- 2nd opinion
- Clinical patient summary
- Disease specific summaries

Around the world many variants of the same basic types of patient summaries

HL7 Consolidated CDA
- seven document types, seven of which were consolidated in CCDA
eStandards can unlock data for trust & flow

Today: Massive health data accumulated in silo EHR systems for documentation

- Need to move from passive documentation to active use of information and knowledge creation: activation!

Patient summaries defined at the macro level for cross-border exchange for emergency or unplanned care at a national level.

- Need to address communities and individuals!

Standards and profiles address a predefined exchange of information.

- Need flexible use of available content and structure, recognizing national, regional or local jurisdictions: trust & flow!

Patient summaries in the Emergency Department

Systems of innovation – unlock data & user experience

Systems of differentiation – profile based data exchange

Systems of record – documentation systems -EHRs
Patients would become far more open with their doctor if they could communicate via email or text instead of phone only.

51% would reach out to them
46% feel more comfortable asking questions
43% would feel less rushed when asking questions

Patients feel doctors using computers or tablets over paper during a visit are:

70% organized and efficient
40% innovative
33% competent

Practices that have adopted technology to replace analog methods of administrative tasks, such as scheduling:

68% a sense of relief
65% confidence
55% comfort

Providers that do not make an effort to improve electronic health information sharing could lose patients to others that are more technologically advanced.

- 40% more likely to recommend their doctor to others
- 36% less likely to switch to a new doctor

If evaluating two comparable doctors, Patients would select the one who let them:

- 57% fill out paperwork online before visit
- 54% receive test results online
- 57% store medical records electronically
- 54% schedule appointments online

http://surescripts.com/connectedpatient/default.html
USA: Connected Care and the Patient Experience

55% of patients report that their medical history is missing or incomplete when they visit their doctor.

- Doctor is not aware of which prescriptions they’re taking: 49%
- Doctor doesn’t already know their allergies: 61%
- Doctor doesn’t know existing medical condition: 40%
- Doctor isn’t aware of recent surgeries, hospitalizations, or visits with other doctors: 44%
- Doctor’s office is missing personal information: 40%
- Insurance information is not on file at the doctor’s office: 38%

Patients are forced to take matters into their own hands.

- 29% needed to physically bring test results, X-rays, or health records from one doctor’s office to another.
- 40% revealed that they have difficulty accessing their own medical records and two in three are only somewhat confident, if at all, that they would be granted access to their own medical information within 24 hours.
Babylon Health to power NHS 111 with ‘AI triage’ bot

NHS111: 15m calls a year, Can AI help?
London Central and West Unscheduled Care Collaborative (LCW), a GP-led not-for-profit organization
Babylon offers subscription based remote GP consultation service 300K users in 2016
But no access to health records!

Triage bots in NHS111
Apps refers the patient to hospital or recommends next-day GP appointment

NHS England: alternative mechanism for integrated urgent care reduce pressure on the NHS

Dr Chaand Nagpaul, the British Medical Association GP committee chairman, was skeptical: “the app would rely “slavishly” on algorithms and could not replace the judgement of trained clinicians.”

GPs: too risk averse!
Questions to you..

1. Please can you outline an example clinical decision for which you would most want to look up an online patient summary in order to make your choice more accurate or more safe?

2. If you had very rapid access to an online patient summary from the computer you are using when seeing emergency patients, what are the medical history facts you are most likely to want to look up?

3. If you found new medical information in an online patient summary that was not already recorded in your own local electronic health record, how likely would you be to trust that information to influence your decision making, and what factors would influence your level of trust?

*Courtesy Prof. D. Kalra*
Sharing Data in the US Between Different EHRs

- ~40% of systems are sharing data
- ~30% of physicians can find the data
- ~20% of the time data is integrated into the physician workflow
- ~10% of the time the data has an impact on patient care

Challenges of sharing summary documents
Emergency Physicians’ Perspectives on Their Use of Health Information Exchange

Shirley A. Thorn, PhD, MN; Michael A. Carter, DNSc, DNP; James E. Bailey, MD, MPH

Study objective: We explore what emergency physicians with access to health information exchange have to say about it and strive to better understand the factors affecting their use of it.

Methods: A qualitative study using grounded theory principles was conducted in 4 urban emergency departments that had health information exchange access for 4 years. Data were collected with unstructured interviews from 15 emergency physicians.

Results: Emergency physicians reported that a number of factors affected their use of health information exchange, but the most prevalent was that it was not user friendly and disrupted workflow. Five major themes emerged: variations in using health information exchange and its access, influencing clinical decisions, balancing challenges and barriers, recognizing benefits and success factors, and justifying not using health information exchange. The themes supported a theoretical interpretation that the process of using health information exchange is more complex than balancing challenges or barriers against benefits, but also how they justify not using it when making clinical decisions. We found that health information exchange systems need to be transformed to meet the needs of emergency physicians and incorporated into their workflow if it is going to be successful. The emergency physicians also identified needed improvements that would increase the frequency of health information exchange use.

Conclusion: The emergency physicians reported that health information exchange disrupted their workflow and was less than desirable to use. The health information exchange systems need to adapt to the needs of the end user to be both useful and useable for emergency physicians. [Ann Emerg Med. 2014;63:329-337.]

Please see page 330 for the Editor’s Capsule Summary of this article.
Editor’s Capsule Summary

What is already known on this topic
Through health information exchanges, emergency department (ED) providers could obtain information from other facilities about patients in their ED.

What question this study addressed
In this qualitative study conducted in 4 EDs, the authors explored what factors affected the use of a health information exchange.

What this study adds to our knowledge
Most providers thought the system was not user friendly, and there was large variation in how often providers looked for information. Physicians made a number of recommendations for improving the usability of the system.

How this is relevant to clinical practice
Computer systems for accessing health information need to be designed by and for physicians. Although previous information may be helpful, physicians are wary about being influenced by such evaluations.

Variations in Using HIE and HIE Access
- Experience with HIE
- Who has access privileges
- Characteristics of HIE User
- Frequency of HIE use

Influencing Clinical Decisions
- Provides missing information
- Assists with assortment of clinical decisions
- Helps with tracking, comparing, trending
- Life-saving tool

Balancing Challenges and Barriers
- HIE not user-friendly / impedes workflow
- Difficult access
- Problematic user-privileges
- Information gaps
- Design flaws
- Deficient technical support / hands-on training
- Lacks physician input
- Interoperability problems

Recognizing Benefits and Success Factors
- Avoids duplicative testing and ordering / decreases costs
- Increases efficiency in patient flow
- Provides a more complete picture of patient
- Identifies primary care physician
- Eliminates fax transmissions

Underlying Reasons

Justifying Not Using HIE
- Medical legal concerns
- Biases clinical decisions
- Culture change
- Competition between hospitals
- Lost revenue

Figure 1. Higher-order themes and categories of HIE use among emergency physicians.
Perspectives on HIE

Health information exchange (HIE):

- 450 providers, 15 clinics, 9 hospitals:
  - 1 million patients

- 4 years in operation, Exchange <10%, 2 ED no documentation

- 15 interviews with Emergency physicians in 4 Eds

- Patient Volume: 36000, 44000, 54000, 60000

- Access to hospital EHRs and Health Information Exchange

Patient summaries in the Emergency Department

22.March.2018
Table 1. Emergency physician profiles (N=15).

<table>
<thead>
<tr>
<th>Environment and Experience</th>
<th>Number of Physicians</th>
<th>Study Sites*</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIE experience (years of use)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1–3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>≥4</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Documentation systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians using electronic documentation in ED</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Physicians not using electronic documentation in ED</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Physicians working in hybrid environments†</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians working in EDs with and without HIE</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

HIE, Health information exchange.

*Study sites: All 4 study sites had implemented electronic health record systems, but 2 of the sites had not yet implemented electronic documentation in the EDs.
†Three emergency physicians worked in a study site with HIE but also worked shifts in other EDs without HIE.
Themes in HIE use among Emergency Physicians and Nurses

Variations in Using HIE and HIE Access

- Experience with HIE
- Who has access privileges
- Characteristics of HIE User
- Frequency of HIE use

Iterative Process

Influencing Clinical Decisions

- Provides missing information
- Assists with assortment of clinical decisions
- Helps with tracking, comparing, trending
- Life-saving tool
Themes in HIE use among Emergency Physicians and Nurses

Balancing Challenges and Barriers

- HIE not user-friendly / impedes workflow
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Recognizing Benefits and Success Factors

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Underlying Reasons
Themes in HIE use among Emergency Physicians and Nurses

Variations in using HIE and HIE access

Balancing Challenges and Barriers

Iterative process

Influencing Clinical Decisions

Against

Recognizing Benefits and Success factors

Underlying Reasons

Justifying Not Using HIE

- Medical legal concerns
- Biases clinical decisions
- Culture change
- Competition between hospitals
- Lost revenue
Table 2. HIE usage rates (N=15): emergency physician-described frequency of HIE use.

<table>
<thead>
<tr>
<th>Physician</th>
<th>Frequency of Use Self-Reported by Physicians</th>
<th>Self-Descriptors[^1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Just about every patient</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Look at internal EHR first; if patients do not come into this ED frequently, look to see whether there are other records in HIE</td>
<td>5% or less</td>
</tr>
<tr>
<td>3</td>
<td>Uses HIE several times a week on a need by need case basis, but not on every patient; some shifts HIE not used.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Department use is 40%; uses HIE on almost every patient. Accessing the history on a patient is vital to decisions. If a very simple patient diagnosis, will not use HIE</td>
<td>Almost 100%</td>
</tr>
<tr>
<td>5[^]</td>
<td>On every patient with a need for past information, but not every patient. Estimates uses HIE for 10–11 shifts out of 13</td>
<td>High</td>
</tr>
<tr>
<td>6[^]</td>
<td>May have spoken with previous participants[^8]; maybe 30%–40%; some days maybe 60%. Depends on whether patient has been to many facilities</td>
<td>30-40%</td>
</tr>
<tr>
<td>7</td>
<td>Uses HIE several times a day; if 20–30 patients a day, probably uses HIE 10 times, maybe 8 times. Identified physician 2 as high user.</td>
<td>High</td>
</tr>
<tr>
<td>8</td>
<td>Uses HIE all the time, about 60%–70% of the time</td>
<td>60%–70%</td>
</tr>
<tr>
<td>9[^]</td>
<td>Occasionally, does not use HIE as much as some of the others and does not know why that is. Uses HIE on certain cases. If HIE were a couple of clicks, would probably use HIE more, but now HIE is more clicks and more time, which decreases use</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Does not have HIE access privileges; relies on nurses to retrieve information</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Maybe 30% or 40% of the time; 35% of the time</td>
<td>35%</td>
</tr>
<tr>
<td>12</td>
<td>Uses HIE for 6 patients out of 16</td>
<td>High</td>
</tr>
<tr>
<td>13</td>
<td>Uses HIE for 5 patients out of 35</td>
<td>High</td>
</tr>
<tr>
<td>14</td>
<td>Does not have HIE access privileges; relies on nurses to retrieve information. Uses HIE for 1 patient out of 20. Some shifts does not use HIE; other shifts 2 or 3 times.</td>
<td>Medium</td>
</tr>
<tr>
<td>15[^]</td>
<td>Uses HIE for 7 or 8 patients out of 20. Usually does</td>
<td>Medium</td>
</tr>
</tbody>
</table>
1. Correct design flaws: such as too many clicks, too much scrolling
2. Standardize information in HIE: ensure that data submissions from participating organizations are consistent
3. Provide physician access during credentialing
4. Integrate HIE, EHR, local, and state pharmacy systems
5. Provide functional portable devices
6. Ensure speed when accessing HIE information
7. Provide physician champions, education, and hands-on training sessions
8. Design HIE/EHR alert systems for patients with HIE records
9. Include patient catchment area: clinics, ambulatory centers, physician offices, psychiatric centers, and radiology clinics
10. Seek emergency physician feedback for HIE design and function

**Figure 2.** Needed HIE improvements proposed by emergency physicians.
Patient summary as Health data navigator

Think of the Patient summary as a window to a person’s health or dashboard:
- Medications, allergies, vaccinations, problems and procedures,
- labs, diagnostic imaging, recent or planned encounters, implantable devices
- advance directives

“Bring the Power of Platforms to Health Care” using data to drive:
- administrative automation, networked knowledge, and resource orchestration [Bush & Fox, HBR November 2016]

eStandards need to
- help build trust
- unlock the power of health data
- facilitate decision support
- navigate the health system
What do we need to make it happen with standards and interoperability?

- **Co-create**
  - make it real by standards

- **Governance**
  - scale for large-scale deployment

- **Alignment**
  - flourish in sustainable ways
Patient summary initiatives

- **Scotland**
  - Emergency Record

- **Greece**
  - Crete (~2010): Pilot of emergency record for frequent users
  - National (recent): medication record

- **France**
- **UK**
- **Luxemburg**
- **China**
- **Spain**
- **Sweden**
- **Portugal**

**Questions:**
1) Automated or manual entry
2) Single or multiple source/custodian
3) Patient access
4) Patient generated data
5) Privacy: Opt-in / option out
6) Business case
7) Added value services
Let’s join forces to make digital health happen in the Emergency Room starting with patient summaries!

Please Contact us:

mhm@medcom.dk
euoffice@HL7.org

www.trilliumbridge.eu
@trillium_Il
Emergency data sets

http://aktin.art-decor.org

Some Emergency Care Endeavors

- Emergency Care Treatment Registry AKTIN
- Emergency Data on Health Card
- Acute Care Reports between Ambulances, 911ers, Emergency Services
- Emergency Discharge Report
- Rescue Report
- Trauma Registry Data Submission for National Trauma Data Bank (NTDB)

source: Kai Heitmann

https://tinyurl.com/y7assld4
Patient Summaries in Norway

Patient summaries in the Emergency Department

- Patient do not have a summary care record
- Summary care record without alerts
- SCR contain info registered from patient
- Alert information exists

Alert
- Must be alerted because it might kill or harm the patient if not known
- Must be easy to find

Diagnosis
- Addison
- Bleeder
- Marfan

Implants
- Heart valve replacement
- Cerebral shunt
- Orthopedic implants

Medications
- Anticoagulants
- Chemo
- Medications currently in use
- What type orthopedic implant

Rest of the medical record

International Patient Summary Workshop, European Commission, Brussels February 2017
Pros and cons

More Writing Than Healing?

The burden of clinical documentation has increased over the last decade, and thus time and money spent on documentation have risen. Digital documentation is considered helpful by doctors and nurses alike. But the status quo is far from satisfactory for most.

Never Underestimate Clinical Documentation

<table>
<thead>
<tr>
<th></th>
<th>Doctors</th>
<th>Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>daily working time</td>
<td>35%</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>44%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Steeperly on the Rise

Time Spent by Doctors for Clinical Documentation Tasks in Minutes [2003 vs 2015]

- Initial Examination (Internal Med): 14.6min / 17.8min
- Quality Management (Surgery): 9.9min / 15.9min
- Validation Issues for Payers (Surgery): 9.2min / 13.8min
- Requests for Rehabilitation (Surgery): 5.2min / 13.0min
- Coding (Internal Med): 7.5min / 11.8min
- Discharge Letters (Internal Med): 22.3min / 17.8min

Source: HIMSS Insights 2015