Traceability of patient records usage:
barriers and opportunities
for improving user interface design
and data management

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Use of past information

Some facts about accessing past information

- ED doctors only try to obtain longitudinal records in 10% of the cases (Shapiro, 2006)

- Doctors access to data from previous encounters in 5% to 20% of the cases (Hripcsak, 2007)
  - even when the user was notified of the availability of such data
The usage of past information varies significantly according to:

- **the setting of care** (emergency, outpatient, inpatient, day-care),
- **information content** (pathology reports, discharge letters),
- **user** (doctor, nurse),
- **patient age** (young, adult, old),
- **main diagnosis**

(Cruz-Correia 2010)
Audit trails and log files

- Audit trails show **who and when has accessed what in a computer**

- Creating an audit trail is an effort involving **several audit controls**, possibly integrated among **multiple information systems** (e.g. RIS, EHR and LIS)

- The resulting audit files is commonly called “**log files**”

- **Log files are valuable** to study how health professionals use data
Aim

To find if and which audit trails / log files exist in Portuguese hospitals

- and if not why

- produce recommendations to create useful logs
Materials and Methods

- Interviews to IT responsibles of 9 hospitals

- Questions:
  - Identify the number of IS that have audit trails?
  - Do you have direct access to them
  - How often does anybody asks to use this data
  - What were the reasons to access audit trails
  - Main benefits to record these logs
  - Main problems to record those logs
Results – Existence of logs

→ Only 1 IS had audit trails active in each institution

  - 21 different IS in average in these hospitals
  - at least 1 more IS with audit trail existed in 3 of them
    - although the representatives didn’t know about it!

→ 1 Pathology Lab IS had the audit trails **disabled** by the Hospital IT staff
Results – Existence of logs

- Only 1 IT representative mentioned considering putting requirements for audit trail feature in new IS.
- There was little concern in confirming the audit trails existed and were being maintained.
Results – Use of audit trails

- Frequency of access to the audit trails
  - Very rarely or never they were asked to access audit trails
  - Few people outside the computer departments knew it was even possible to collect this data
    - and that if other people knew maybe they would ask for it

- Reasons to access
  - 1 responsible of the radiology dep. used them to audit which doctors were discharging patients from the ER without viewing the reports
Results – Potential benefits mentioned

→ To maintain or to remove IS implemented functionalities

→ Health services research could be performed (e.g. workflows)

→ Assessing available and seen patient data by health professionals at the time of clinical decisions for legal or ethical reasons

→ Dissuade inappropriate access to patient data from registered users
Results – Mentioned difficulties in having audit trails

- Amount of disk space it took (e.g. plus X MB/year are required)

- It would make the IS work slower

- Access directly the IS database tables or log text files

  - No suitable log analysis tool
For an audit trail to be comprehensible regarding the time, the stored values must:

- have sufficient detail (seconds or milliseconds)
- and be unambiguous

- differences in storing date/time formats
- summer and winter time (i.e. daylight summer time)
- synchronization of computer clocks
Recommendations (2)

→ Information about actions

  - Starting a session, Patient searches, Visualization of patient of data, Data changes

→ Information about user sessions

  - Username, Start and end session date, How was the session terminated (by the user, timeout or other), Terminal IP number

→ Record information about who accesses the audit trails / log files

→ Create and install audit visualization tools
Main conclusions

- **Limitations: small sample (9 of 100 hospitals)**

- Most of the users’ accesses to patient information are not recorded or monitored in Portuguese hospitals

- The responsibilities for IT departments seem not to be sensible to these issues
Thank you for your attention

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- **Patient records**
  - Central repositories
  - Departmental Patient Records (O&G, Breast, ICU, ...)
  - Regional networks
  - **Information and work flow improvement**

- **Security**
  - Role-base access control

- **Knowledge discovery**
  - Data mining
  - Performance indicators
  - **Log analysis (audit trails)**

- **Technology assessment**