Security, Safety, and Related Technology – The Triangle of eHealth Service Provision

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Combining Standardization and Safety in eHealth

The Commission plans to issue a recommendation on cross-border interoperability of electronic health record systems, laying out clear guidelines for arriving at the keenly anticipated scenario of enabling patients to access electronic health records anywhere any time.

There is a need to emphasize the improvement to patient safety that ICT can facilitate, especially as a result of the enhanced interoperability of systems.

Combining standardization and safety in eHealth must now be seen as a priority issue by all stakeholders. It is fundamental to define a common understanding through semantics in healthcare.
• George Mihalas, former EFMI President, raised questions in his “Welcome Address to Göteborg and MIE 2008”
  – “How can we assure the increased medical information accessibility without affecting its security and confidentiality?”
  – “How can eHealth contribute to improve both healthcare service quality and patient safety?”
• Workshops, e.g., offered by EFMI WG “Safety, Security and Ethics” and by EFMI WG “Personal Portable Devices (PPD)” as well as many tracks and related presentations …
Devices, devices, devices …

- Emergency Ambulance
- Diagnosis Decisions
- Further Treatment
  - Reha
  - Home Care
- Emergency Car
- Observations Investigations
- Monitoring

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A few remarks

- Simplified, safe, secure, trustworthy, and standardized methods to access health information, health applications, and health services
- Diversity of systems like Health Information Systems, Public Health Systems, GP systems, epidemiological and medical registries, departmental systems, EHR / PHR
- Extended networks of health professionals, healthcare establishments, and increasingly also patients (citizens) crossing national borders and domain boundaries
- Personal portable (biomedical) devices and state-of-the-art eHealth technology for homecare, wellness, lifestyle, mobility, etc.
- Key to successfully applying security services and related mechanisms like integrity, confidentiality, accountability: proper authentication (identification and verification) procedure
- Key to proper authentication: reliable identity management including all principals involved
We face eHealth challenges

• Challenge 1: Make healthcare, social security and welfare secure, safe, trustworthy, and reliable
• Challenge 2: Make it available to all
• Challenge 3: Don’t forget it’s always the users who make systems accepted and work

• Personalized and ubiquitous health services, wireless Body Area Networks, micro systems, nano technology, devices
• RFID, NFC, biometrics to be applied in healthcare and welfare

• Serious concerns about safety of many of these technologies
  – Biometrics: iris recognition, potential eye damages
  – Biometrics: fingerprint, contamination, communicable diseases
  – RFID: electromagnetic pollution, interference

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eHealth Good Practice triangle

Biometrics, tokens, PPD

Domain requirements, legislation, solutions, quality

Security, administrative data protection

Safety, ethics, moral, regulations
Dimensions of Safety

• Technical safety
  – Mechanical safety
  – Electrical safety
  – Electronic safety

• Physical safety
  – Personal (patient / medical / clinical) safety
  – Mental safety
  – Drug safety

• Safety as psychological category
  – Reliability, awareness, confidence, acceptance
  – Hippocratic Oath, medical secrecy, trust
Biometrics and Safety

• Biometrics as valid support for healthcare and welfare processes
• Main purpose: No misidentification of the patient before surgery or other procedure
• Fingerprint scanning, hand geometry, iris recognition
• Patients: health implications in using biometric devices ??
• Iris recognition: fear about possible contaminations and potential eye damage
• Hand geometry and fingerprint recognition: physical contact with sensor (communicable diseases?)
• “User’s satisfaction” is one of the important key success factors
• Security: biometrics for verification purposes
RFID and Safety

- RFID = Radio Frequency IDentification
- Information systems consisting of RFID chips
- Exchange of data with RFID reader at radio frequencies (few cm)

- RFID considered correlated to possible physical threats
- Expected omnipresence of Electromagnetic Fields (EMF)
- Possible effects on biological systems of electric and thermal nature
- Mainly expected by stimulation of the central or peripheral nervous system or temperature rise
- Low-level exposure to EMF except certain groups
  - E.g. pacemaker holders, other technical implants
- Danger: RFID in micro formats (in liquids)
- Not only safety but also privacy (profiling)
• Healthcare and welfare world-wide is significantly and progressively growing ignoring traditional boundaries.
• Advanced standards-based secure and trustworthy health networks are surely able to meet the aforementioned challenges of eHealth.
• It’s not a question of applicable technology - it’s a matter of common understanding and common legislation.
• Healthcare and welfare procedures are based on trust, behavior, awareness, confidence, and acceptance.
• Let’s move the citizen (patient) into the center of all addressed healthcare and welfare processes.
• Security and safety are thereby a major pre-requisite, and policies and legislation can, and have to, support security and safety.
• Security and safety: key to technical success stories
• Related awareness, confidence, acceptance: key to usage
Conclusions

In healthcare and welfare but in almost all other domains alike, there is a basic rule each and every law, regulation, declaration, and technical specification must actively and consequently support:

SAFETY FIRST!
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