Exposing Privacy Concerns in mHealth Data Sharing

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HealthSec 2011

mHealth Architecture

Electronic/Personal
Health Record (Server)

Patient

Courtesy: http://ironmantriathlontips.com

Courtesy: http://benchmark.bpcsite.com

Courtesy: http://medicallink.com

Courtesy: http://hhs.state.ne.us

Consumer
(Client)

Benefits vs privacy

- **Consumers & personal information:**
  86% of American shoppers use store cards, "and **most say the benefits are worth giving up some privacy**" [2004 poll]
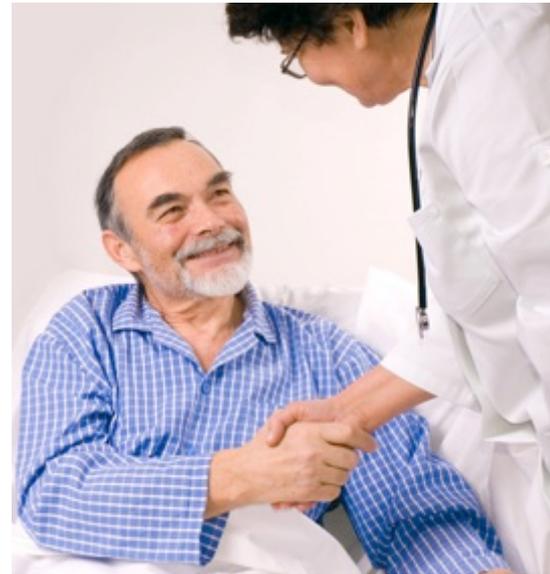
- **Health information:**
  60% think **benefits of electronic health records outweigh privacy concerns** [2007 survey]

Is there a third option?

Expressive privacy controls

- enjoy health benefits

- limit exposure

Courtesy: bannerhealth.com

- Students, hospital outpatients and residents of retirement home
- Scenarios

Medication

Exercise

Location

Interactions

- Benefits/disadvantages

- Privacy concerns

  - information type

  - time and location

- Sharing with doctor, family and friends

- Controls to limit transmission

- Sharing of personal health information
  - Medium of transmission
  - *What* is being shared
    - Sensitivity level

      Social interactions

      Location

      Medication

      Diet and exercise
  - Benefits outweigh privacy in case of serious illness

Courtesy: networkworld.com

Focus Groups - Results

- *Who* information is being shared with
  - Insurance companies and employers

	Doctors	Family and friends
Outpatients	Share all information	Share only with caregivers
Residents	Share some information	Share with trained caregivers
Students	Mixed responses	Share with trained caregivers Share only if incapable of making decisions on their own

- Control
  - To turn device on or off
  - To choose what to share and with whom

Courtesy: http://comapleteorganizingsolutions.com
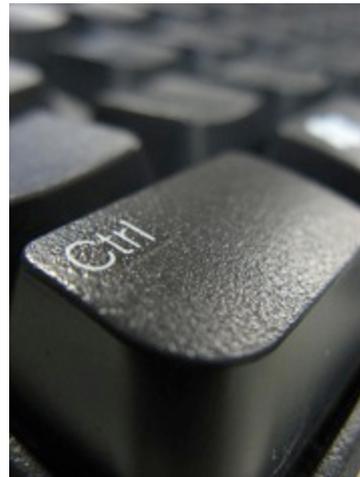
Privacy controls

- Annotations

- Access logs

- Sensible default settings

- Hierarchical controls

Activity ☒

    Steps   ☐
    Calories   ☐
    Type   ☒
    Heart rate   ☒
    Location   ☐

Courtesy: http://static.imt.ie

- Students carry Fitbits for 5 days
- Share information with family, friends and third parties
- Goal : understand how people share their activity and sleep data

Courtesy: http://fitbit.com

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