M-health: Using mobile telephony in healthcare

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Mobile is here

- 4.6 billion users worldwide
- Always-on, always-with-me
- Phone ⇒ computing device

- Potential within health & social care to reach different populations in novel ways
- Big commercial interest and investment in mobile health
  - 78% increase in medical apps downloaded (2010)

Note: * Estimates.
Source: ITU World Telecommunication/ICT Indicators database.
Good morning. Remember you have an appointment at the clinic this afternoon. To cancel or change the appointment, ring 020 7288 3383.
Appointment reminders

• 22 million missed appointments in the NHS per year, costing ~£790 million
• SMS (text) reminders widely used outside medicine, from hairdressers to vets
• SMS reminders reduce non-attendance rates between 6-38% in RCTs
• SMS reminders demonstrated to be cost-effective
• Need to be integrated into booking systems
STOMP Quiz: how long does it take for nicotine to leave your body? 2 days, 2 weeks or 2 years — we will send you the answer later today!

Example from Rodgers et al. (2005), Tob Control 14: 255-61
Behaviour change

• More intensive than a single reminder
• Proven to work
  – Smoking cessation: 1.7-2.4 times higher likelihood of giving up smoking
  – Medication adherence: 11%-23% improvements
  – Long-term conditions: various trials showing improvements for diabetes
• Possible future uses
  – Computerised Cognitive-Behaviour Therapy
• Simple SMS technology or more complex apps
M2M
(machine to machine)
M2M (machine to machine)

- Direct messaging from home glucometer/ coagulometer/ sphygmomanometer
- Patient-reported outcomes on hospital wards (with a cheap, easy-to-clean, droppable device)
- Emergency alerting systems
### Personal Health Records

#### Details:
- **Drugs**
  - Hydrochlorothiazide 12.5 mg Capsule
  - Minoxidil 2.5 mg Tablet
  - Multivitamin Tablet
  - Nadolol 40 mg Tablet

- **Diagnosis**
  - Hair Loss
  - Low Blood Sugar
  - Osteoarthritis
  - Tremor

- **Allergies**
  - Cephalexin

- **Tests**
  - Creatine (0.9 mg/dL) 01/08/2009
  - Hemoglobin - Blood (12.5 mg/dL) 01/15/2009
  - HDL Low-Density Lipoprotein (LDL) (145 mg/dL) 01/07/2009

- **Procedures**
PHRs: personal health records

- Electronic health record controlled by the patient, or with patient access
- Patient’s mobile phone acts as an additional way of accessing the PHR
Devices attached to the mobile phone — eSTI² receives £4M grant

And the future…?
“Utopia is that which is in contradiction with reality” – Albert Camus

• So many promises have been made for technology that were not delivered
  – Choose & Book (Green et al., BMC Med Informatics Dec Mak 2008, 8, 36)
  – Connecting for Health (Greenhalgh et al., BMJ 2010, 340, c3111)

• Problems scaling up m-health systems
• M-health still dominated by technology ‘push’ rather than clinician ‘pull’
• Proprietary, commercial systems under-delivering
But remember the 1880s…

• We got used to (fixed) phones!
  – The Lancet warns that if patients can telephone and converse with their doctors “for a penny, they will be apt to abuse the privilege” (1883); to diagnose by telephone rather than in person is “not in accord with the true ideal of professional duty” (1887)

• What we need from m-health now is…
  – Scalability
  – Interoperability
  – Clinically reassuring
“The future of cellular telephony is to make people’s lives better – the most important way, in my view, will be the opportunity to revolutionise healthcare.”

Martin Cooper, inventor of the mobile phone

Thank you

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