

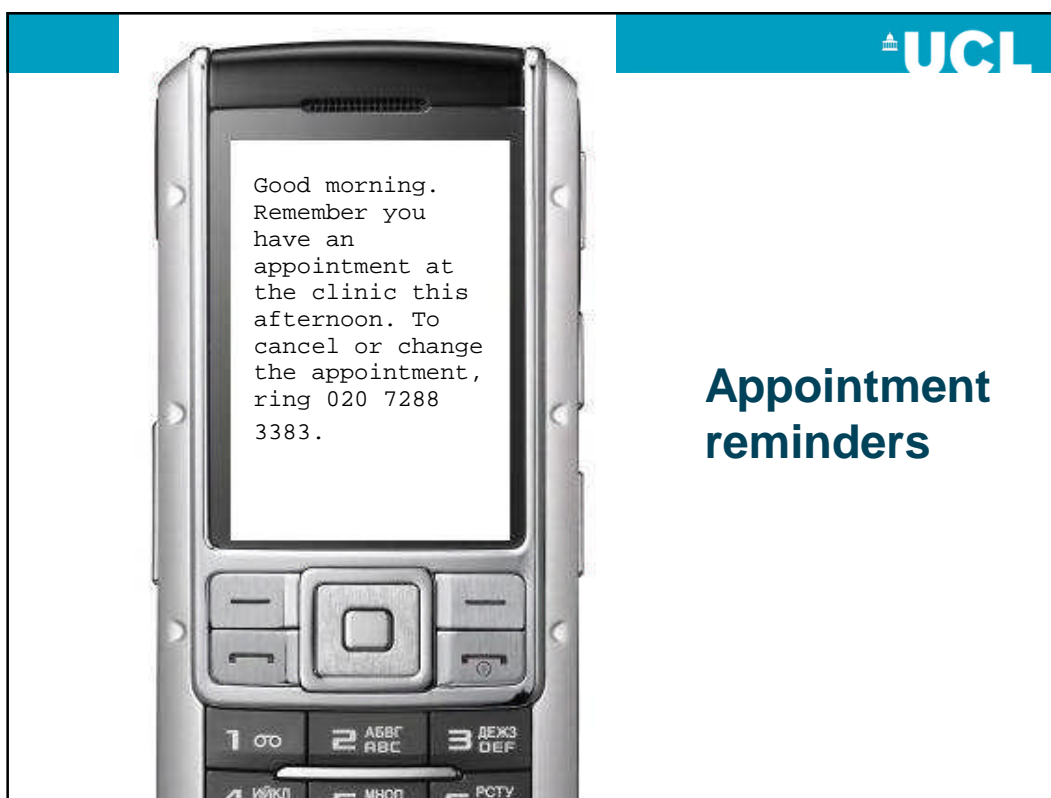


## Mobile is here

- >4.6 billion users worldwide
- Always-on, always-with-me
- Phone ⇒ computer
- Numerous uses in m-health, m-libraries, m-learning...





## 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 doz it tk 4 nicotne 2 leave yr body? 2dys, 2wks or 2yrs - we will snd u th answer later today!

**Behaviour change**

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



**M2M  
(machine to  
machine)**

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**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

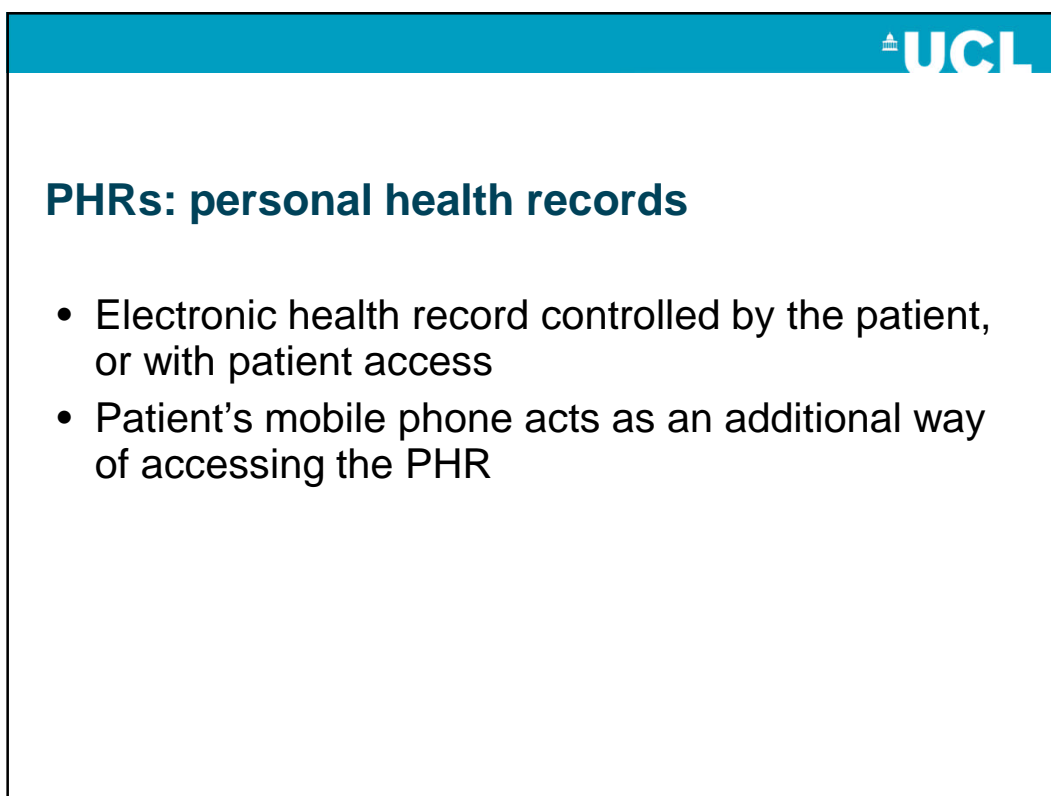
Dr Foster's Patient Experience Tracker

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**Personal health records**




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**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

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And the future...?

Devices attached to the mobile phone  
— eSTI<sup>2</sup> receives £4M grant

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**And...**

- Mobile computerised Cognitive-Behaviour Therapy
- Epidemiology
- M-learning
- ...

## Y r u obsessed w apps? :-)

- Don't overlook SMS (text) & interactive voice response
- Near universal coverage; no fragmentation
- UK
  - 62M population, 82M mobile phone subscriptions, 25M smartphones, 40% smartphone penetration
- India
  - 1220M population, 973M mobile phone subscriptions, 33M smartphones, 3% smartphone penetration

## “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

## Principles to support technology innovation?

Involve users in design

Allow co-evolution of technology and usage

Recognise issues with top-down and bottom-up approaches (middle-out?)

Address the complexity of work practices

Address organisational issues

Get the infrastructure right

Technology push v. user pull

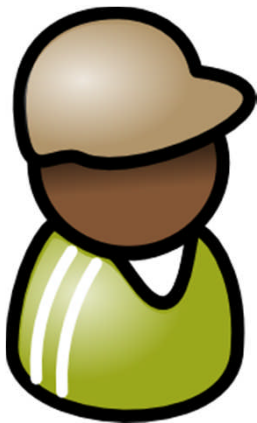
In electronic health records: Greenhalgh, Potts *et al.*, *Milbank Quarterly* 2009, 87(4):729-88

“if you think IT is the solution to your problem, then you don't understand IT, and you don't understand your problem either.”


Roger Needham, CBE



- To make systems work, you need buy-in from staff: how will the system benefit *them*?
- Don't just think at the top level: how can each ward/GP surgery/district nurse use it?
- Adoption of technology is a fluid and contingent process of change, entailing a co-evolution of work practices and the technology, where each adapts to the other
  - Marc Berg talks of "growing" rather than building IT systems and working to achieve synergy among three fundamental (re)design tasks: technical system, primary work process (e.g. clinical care) and secondary work process (e.g. audit)






*Manager:* Let's outsource the appointment reminder system. It will be easier to commission and no extra workload for our staff.

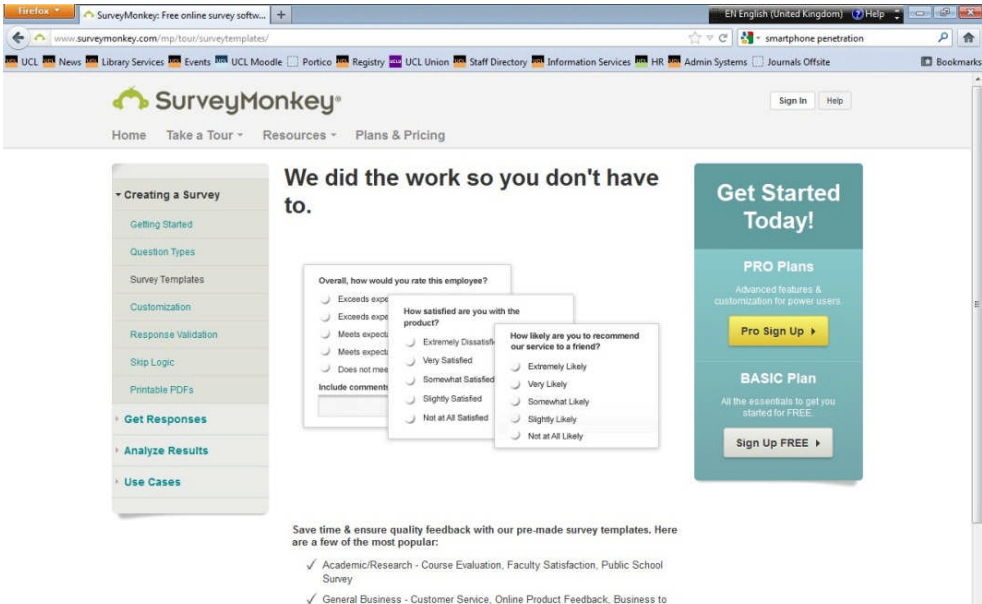


*Patient:* I didn't get a reminder, so I thought my appointment had been cancelled...

*Receptionist:* We don't control that system. I don't know how it works.

## Make it easy-to-use



The screenshot shows the SurveyMonkey website with a navigation menu on the left, a central content area with survey examples, and a 'Get Started Today!' sidebar on the right. The central content area includes a navigation menu, a headline 'We did the work so you don't have to.', three survey question examples, and a list of pre-made survey templates.

**Creating a Survey**

- Getting Started
- Question Types
- Survey Templates
- Customization
- Response Validation
- Skip Logic
- Printable PDFs

**Get Responses**

**Analyze Results**

**Use Cases**

**We did the work so you don't have to.**

Overall, how would you rate this employee?

- Exceeds expect
- Exceeds expect
- Meets expect
- Meets expect
- Does not mee
- Include comments

How satisfied are you with the product?

- Extremely Dissatisf
- Very Satisfied
- Somewhat Satisfied
- Slightly Satisfied
- Not at All Satisfied

How likely are you to recommend our service to a friend?

- Extremely Likely
- Very Likely
- Somewhat Likely
- Slightly Likely
- Not at All Likely

**Get Started Today!**

**PRO Plans**  
Advanced features & customization for power users.  
[Pro Sign Up](#)

**BASIC Plan**  
All the essentials to get you started for FREE.  
[Sign Up FREE](#)

Save time & ensure quality feedback with our pre-made survey templates. Here are a few of the most popular:

- ✓ Academic/Research - Course Evaluation, Faculty Satisfaction, Public School Survey
- ✓ General Business - Customer Service, Online Product Feedback, Business to

## Money

- Unlike Internet, most mobile activities have to be paid for
- What does the end user pay? What does the institution pay?
- Individual SMS are *exceedingly* cheap



- Operators want volume
  - Many health services do not deliver volume, so we have to think in terms of aggregating
- Considerable interest in health sector from mobile sector
  - ... but don't be surprised if they all withdraw again!
- Go for generic tools
- Often the simplest tools – access to e-mail, maps – are the most useful



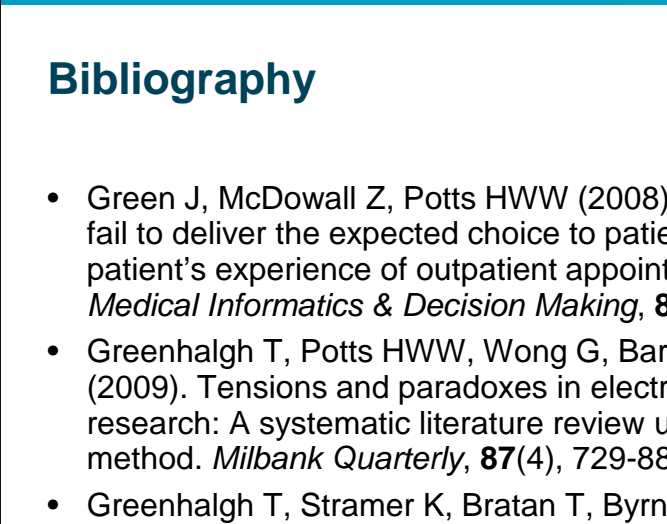
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*“The future of cellular telephony is to make people’s lives better – the most important way, in my view, will be the opportunity to revolutionise healthcare.”*

Martin Cooper, inventor of the mobile phone

**Thank you**

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Potts HWW, "Going Forwards: Realising the Potential of M-Health Innovation". At HealthTech NHS IT Strategy Forum, Warwick, UK, 3-4 Oct 2012.