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# A UK perspective on smartphone use amongst doctors within the surgical profession

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## HIGHLIGHTS

- Doctors use their own mobile devices to support their work due to limitations in time and space.
- Of those surveyed >90% owned a smartphone.
- 80% owning smartphones were willing to use their own device within the workplace in a 'BYOD' manner.
- >50% of smartphone users own medical apps and >85% use the Internet to access medical information.
- It may valuable to further develop software that recognises this potential of mobile access.

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## ABSTRACT

*Introduction:* Hospitals are increasingly looking for mobile solutions to meet their information technology needs. Medical professionals are using personal mobile devices to support their work, because of limitations in both time and space. Our aims were to assess smartphone use amongst UK surgical doctors, the prevalence of medical app use and online activity.

*Methods:* A thirteen-item questionnaire was derived to identify the proportion of surgical doctors of all grades using smartphones within the workplace. The following factors were evaluated: use of medical apps; use of online medical resources and if users were willing to use their own smartphone for clinical use.

*Results:* A total of 341 participants were surveyed with a complete response rate: 93.5% of which owned a smartphone, with 54.2% of those owning medical apps and 86.2% using their device to access online medical resources.

Junior doctors were more likely to use medical apps over their senior colleagues ($p = 0.001$) as well as access the Internet on their smartphone for medical information ($p < 0.001$).

Overall, 79.3% stated that they would be willing to use their smartphone for clinical use, which was found not to be dependent on seniority ($p = 0.922$).

*Conclusion:* Online resources contribute significantly to clinical activities with the majority of smartphone users willing to use their own device. The information gathered from this study can aid developers to create software dedicated to the smartphone operating systems in greatest use and to potentially increase the use of a bring your own device (BYOD) scheme.



## 1. Introduction

In 2008, the Apple iPhone 3G *(Apple Inc., USA)* was released along with a dedicated application ('App') store, which allowed self-contained programs designed to fulfil a particular purpose to

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be downloaded to a device. This technology was subsequently applied to other mobile operating systems.

In November 2012, the UK's Department of Health issued a mandate setting out objectives for the National Health Service (NHS) Commissioning Board to make progress in four key areas, including the use of technology [1].

An increased uptake of smartphones has allowed the use of Internet accessible devices to aid information retrieval within the workplace. The use of information technology (IT) within healthcare has become ubiquitous [2].

Hospitals are increasingly looking for mobile solutions to aid both clinical care and research [3]. As a result, a gradual shift in the focus of mobile healthcare has taken place in hospitals. This has been partly due to a greater proportion of medical professionals considering use of mobile devices to support their work because of limitations in time and space [4]. A possible solution to this issue is to make use of those that already own smartphones in a 'bring your own device' (BYOD) scheme, which has adopted by numerous industries, including local councils in the UK [5].

Several reviews have highlighted the roles of smartphone technology within the hospital workplace in addition to flexible communication via multiple modalities such as voice calls, short message services (SMS) texts and e-mail [6–8]. These include: portability; rapid access to online information; use of medical mobile applications and multimedia resources as reference/decision-aiding tools and potential access to patient records.

Due to the limited availability of desktop workstations to access patient records, request further investigations and access reference tools, a solution is required to ensure that this information can be accessed promptly on the go. Improved efficiency was observed amongst resident physicians in the US following the introduction of Apple iPads into the workplace to access medical records [9].

Our study chose to focus on the use of smartphone technology amongst doctors working within surgical specialties in the UK. Our aims were to identify the prevalence of smartphone ownership, medical app use and relevant online activities; and in addition if smartphone users would be happy to use their own device for clinical use. An additional aim was to identify if there was any scope for future app development.

## 2. Materials and methods

A thirteen-item questionnaire (Fig. 1) was derived based on the authors' experiences and critical appraisal of the current medical literature regarding smartphone use [10–12]. Pre-testing of the questionnaire was performed locally within the authors' own departments to determine suitability and comprehension of the questions.

The study identified the following factors:

- Demographics
- Smartphone ownership
- Medical apps owned
- Frequency of app use
- Use of internet search engines and websites accessed for medical use
- Whether there was any scope for app development
- Whether the participant would be happy to use their smartphone in a BYOD manner

### 2.1. Participant selection

Participants included training and non-training grade doctors of ascending level (from Foundation Year doctors; Core Trainees and Trust Grade doctors; Clinical Research Fellows, Specialty Trainees and Staff & Associate Specialist Grades (SASG) to Consultancy) working within surgical specialties. The questionnaire was distributed by hand to individuals at a national meeting and at nine regional meetings in three deaneries (Yorkshire & Humber, Mersey & East Midlands).

| | | | |
|---|---|---|---|
| Age | | Gender | Male / Female |
| Current position | FY1<br>Core Trainee<br>Trust Grade<br>SASG/Associate specialist<br>Consultant<br>Other (Please state): | | FY2<br>Specialty Trainee |
| Current specialty | | | |
| Do you own a Smartphone/Tablet? If so, what? | Yes/No<br>iPhone / iPad / Blackberry / Android / Windows<br>Other: | | |
| Do you own any medical apps that aid with work? | Yes/No | If so, which ones? | |
| Do you have a favourite work-related app? (Name) | | | |
| How often do you use any of the medical apps? | Daily / Weekly / Rarely / Never | | |
| Do you use an internet search engine on your smartphone or tablet to access relevant medical information? | Yes / No | | |
| How often do you use an internet search engine to access medical information? | Daily / Weekly / Rarely / Never | | |
| Are there any specific websites that you use to access medical information? | Google or other search engine /eMedicine / UpToDate / Wikipedia / NICE/patient.co.uk / Hospital intranet<br>Other: | | |
| Are there any medical apps that you would like to use that aren't currently available? | | | |
| If you were required to use a smartphone for hospital based work – would you be happy to use your own? | Yes / No | | |

**Fig. 1.** Questionnaire: A survey to assess smartphone use amongst surgical doctors.

Survey distribution was carried out by the authors approaching individual delegates during breaks in the designated refreshments area with the questionnaire. Questionnaires were collected immediately upon completion and placed into a document wallet. The study was performed over a 6-month period (June 2013 to November 2013). The questionnaires were delivered in paper form and collected after completion to ensure an optimal response rate. All participants were made aware that completion of the questionnaires was voluntary and that completion was taken as consent to participate within the study. No incentives were offered to the participants. Participants were asked whether they had previously participated in the survey prior to completing a form to avoid duplication.

Although a proportion of the foundation doctors were not currently on a surgical firm, they had all worked within a surgical team within the previous 12 months. We chose to include this group, as their role was likely to be very similar despite the change in specialty. Surgical nurse specialists were also approached with the questionnaire.

Ages were categorised in four groups: Under 30, 30–39, 40–49 and Over 49.