

Fifteen minute consultation: When can I use a medical app?

Gala Rowe-Setz,¹ Wilhelm Behringer,² Damian Roland ^{3,4},
Mark D Lyttle,^{5,6} Haiko Kurt Jahn ^{2,7}

¹Children's Emergency Department, The Royal Belfast Hospital for Sick Children, 274 Grosvenor Rd, Belfast BT12 6BA, Northern Ireland, UK

²Faculty of Medicine, Center of Emergency Medicine, Friedrich-Schiller-Universität Jena, Jena, Germany

³Health Sciences, University of Leicester, Leicester, UK

⁴Paediatric Emergency Medicine Leicester Academic (PEMLA) Group, Leicester Hospitals, Leicester, England

⁵Emergency Department, Bristol Royal Hospital for Children, Bristol, UK

⁶Academic Department of Emergency Care, University of the West of England, Bristol, UK

⁷Children's Emergency Department, Royal Belfast Hospital for Sick Children, Belfast, UK

Correspondence to

Dr Haiko Kurt Jahn, Friedrich-Schiller-Universität Jena, Jena 07743, Thüringen, Germany; haiko.jahn@doctors.org.uk

Received 21 June 2020
Revised 4 August 2020
Accepted 7 August 2020
Published Online First
18 September 2020



Check for updates

© Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Rowe-Setz G, Behringer W, Roland D, et al. *Arch Dis Child Educ Pract Ed* 2021;**106**:258–263.

ABSTRACT

Advances in mobile device technology and internet connectivity have created powerful new mobile health (mHealth) and telemedicine capabilities. The guidelines regarding mHealth use in the clinical environment can be conflicting, which has resulted in some reluctance by institutions and medical staff to fully embrace these advances due to privacy and patient confidentiality concerns among others. The COVID-19 response has led to departments to reconfigure care and revisit mHealth as a tool to allow social distancing and remote care. This article reviews mHealth guidance in practice and describes its use and interpretation as rapid decision-making aid and in telehealth.

INTRODUCTION

Mobile health (mHealth) is the practice of medicine supported by mobile devices and wireless infrastructure. This has been shown to improve patient care by providing rapid decision-making support, such as drug information, dosage calculators and algorithms.¹ The use of mobile devices with camera and video functions offers new options for near and remote patient care,^{2–4} including advances in telehealth and telemedicine for remote triage and consultation.^{4 5} The literature supports the use of mHealth to improve patient outcomes in defined clinical scenarios.⁶ Despite these advantages, there has been some reluctance in the adaptation of mHealth as clinical guidance can be conflicting.

BACKGROUND

Advances in technology have resulted in various mHealth management and communication aids for clinicians. The development of this technology has occurred quicker than existing hospital and healthcare policies can keep up, creating dissonance in health policy. Previous bans on mobile devices may not be in line with National Health Service (NHS) UK digital guidance, strategy and

recommendations on how to manage and implement this digital revolution.⁷ In 2013, NHS Digital launched an NHS reviewed library of health apps (<https://www.nhs.uk/apps-library/>) both for patients and clinicians. Despite this, little guidance exists on how clinicians should use personal mobile devices and medical apps in the clinical environment. The Royal College of Nursing (UK) advises that nursing staff should not use their personal mobile devices for recording, transmitting or storing patient identifiable information at any time.⁸

NHS Digital has produced guidance based on the European General Data Protection Regulation (GDPR) to ensure a high enough level of encryption when communicating patient identifiable information, for example, images or paperless notes via email or mobile device technology.⁷ NHS Digital has also developed bring your own device (BYOD) policy. This allows staff to register their personal devices with the trust network. The device is then encrypted, password protected and subject to a user agreement where, in the event of a breach or risk of breach of confidentiality, all information on the device can be erased.^{7 9} This is a positive development. Trusts should encourage their staff to register their personal device if they use it to access or communicate patient identifiable information.

Previous surveys suggested that instant messaging apps such as WhatsApp are widespread in healthcare in the UK.^{10 11} This has led to problems with patient images appearing on clinician's home television sets as a result of instant message apps automatically synching with household devices, resulting in a serious breach of patient confidentiality.¹² On one hand, this led to the development of specialist secure messaging apps.^{10 11} On the other hand, this led to some trusts banning mobile device use wholesale. This ban will neither stop instant messaging use nor solve the issue long term in the absence of alternatives, leading to conflicting

Box 1 Guidance for medical app use, for example, BNF/BNFc or similar

- ▶ Adhere to local and national guidelines.
- ▶ Be courteous and explain, and if indicated, allow patients to medical app use.
- ▶ Document any actions taken contemporaneously in the patient's notes.
- ▶ Infection control measures, that is, cleaning of mobile device when using in clinical environment.

guidance regarding mobile device use for clinicians at some trusts.

Regulators classify apps as medical devices if they calculate medicine doses, diagnose disease or give a risk score of having one.¹³ Most apps are not licensed with a regulator Medicines and Healthcare products Regulatory Agency (MHRA) as approved devices nor CE (EU certification mark) marked. Regulatory approval can reassure both healthcare professionals and patients that the app has met certain requirements and that problems can be reported (<https://yellow-card.mhra.gov.uk/>). MHRA-approved apps include the Mersey Burns and NeoMate app.¹⁴ The Food and Drug Administration 'precertification' for medical apps is another way to address this issue.¹⁵

Case:part 1

You are the paediatric on call doctor in the emergency department at night. You get a stand-by call for a 2-year-old child who has sustained a scald. The child will be arriving in 10 min.

To prepare yourself for the imminent arrival of this patient, you consider what resuscitation aids you have available. You have several apps on your personal mobile device. Are you allowed to use them and what are the potential benefits?

Medical apps as prescribing and resuscitation aids have been shown by their developers to be superior in inotrope prescribing with medical students outperforming consultant.¹⁶ The Mersey burns app has been shown by the developer to be more accurate in estimating burn surface area than using the body diagrams,¹⁴ and the Microguide app has been shown to improve antibiotic stewardship.¹⁷ Despite these potential advantages, only a minority of emergency departments have developed medical apps specific to their needs.¹⁸ Registration of apps as medical devices or endorsement of the apps by trusted bodies can reassure and improve acceptability by both clinicians and patients.^{13 19}

In a recent Paediatric Emergency Research in the United Kingdom & Ireland (PERUKI) survey, only half of responding sites had a policy on mobile device use in the clinical environment, and mobile device use was generally up to individual clinician choice. Only a minority of sites enforced the no-use policy. Equally, only a minority of sites provided their staff with institutional mobile devices,

Box 2 Recommendations for trusts/departments

- ▶ Banning personal mobile device use in the absence of alternatives is unlikely to be successful.
- ▶ Consider listing approved/recommended apps, that is, BNF/BNFc, Microguide, regional resuscitation medical apps.
- ▶ Discourage the use of instant messaging app (eg, WhatsApp or Viber) for confidential patient information.
- ▶ Encourage the use of instant messaging groups (eg, WhatsApp or Viber) for team communication (eg, rota planning) only.
- ▶ Consider selecting trust wide secure messaging app for sharing images with burns/plastics/dermatology, etc.
- ▶ Consider setting up specialty team email (eg, burnsunit@trust.nhs.uk) for patient to directly send images and for virtual clinic follow-up.

leading staff to default to their personal mobile device.¹⁸ The NHS (BYOD) has mainly focused on data security when accessing patient information remotely or patient information via a mobile device rather than on medical app use in the clinical environment.⁷ Patient acceptability concerns were highlighted at inception of the iDoc project in Wales.²⁰ This is not borne out in practice when app use is explained to patients¹⁸ (see [boxes 1 and 2](#)).

Case:part 2

You have stabilized the patient and you consult the burns teams for advice. They have asked for photos of the burns to be sent.

The use of the institutional camera was the leading method for sharing images and the use of instant messaging and specialist communication apps was not widespread in a recent Paediatric Emergency Research in the United Kingdom & Ireland (PERUKI) survey.¹⁸ The National Trauma Network has approved WhatsApp as an official team communications app; however, this does not involve any confidential patient information.²¹ Many clinicians have turned to WhatsApp and similar instant messaging services on their personal mobile device in the absence of an alternative, despite the known patient confidentiality and data security risks.^{10 11} NHS Digital guidance states that one should only use these instant messaging services (eg, WhatsApp or Viber) if there are no alternatives available⁷ ([box 3](#)). Some trusts have adopted various specialist secure messaging apps, including Siilo, MDSAS, Hospify, Forward and MedxNote to improve data security and patient confidentiality as these apps are password protected, and the images sent and received are not stored on the users device.²² The majority of clinicians do not have access to departmental mobile device to run these apps, leading them to default to their personal devices.^{10 18 22} Clinicians may neither feel comfortable nor be able to use their personal device for work purposes involving confidential patient data.⁸

Box 3 Guidance for instant messaging app use and smartphone photography on the personal mobile device

- ▶ Register your personal devices with the individual trust network as per NHS Digital 'bring your own device' policy.
- ▶ Use General Data Protection Regulation (GDPR) compliant secure specialist messaging apps if available.
- ▶ If no secure specialist messaging apps are available, use an instant messaging app that meets the NHS encryption standard (AES 256).
- ▶ Use messaging apps that uses end-user verification to verify that the people are indeed who they say they are. In the absence of end-user verification, consider confirming their identity with a return message.
- ▶ Use messaging apps that are passcode protected, for example, with a secondary personal identification number (PIN) and that are time-out enabled.
- ▶ Use messaging apps that have a remote-wipe function so that messages can be removed if the device is lost, stolen or redeployed to another staff member.
- ▶ Do not allow anyone else to use your device until all confidential patient information has been deleted.
- ▶ Use a messaging app that automatically deletes messages after a set time period.
- ▶ Disable message notifications on your device's lock screen to protect patient confidentiality.
- ▶ Disable cloud syncing of your device.
- ▶ When using smartphone photography, verbal consent and written consent should be sought as appropriate.
- ▶ Record-keeping policies and patient confidentiality still apply when using instant messaging whether the communication is documented itself or by outcome.
- ▶ Keep separate clinical records and delete the original messaging notes and images once any advice has been transcribed and attributed contemporaneously in the patient's medical record.

The British Dermatology Association has released guidance for smartphone photography stating this should only be used as a last resort. They recommend written consent for all smartphone photography of patient identifiable or sensitive areas such as the face and verbal consent for the remainder²³ (boxes 2 and 3).

Another alternative is for the patients to take the photographs on their own smartphone and then email the specialist directly on their departmental email address. Clear pathways need to be established to allow this and thought needs to be given what information should be included in the email, that is, what patient identifier and contact details needed to be included, especially if the patient is to be followed up at a later date or via a virtual clinic (boxes 2 and 4).

In the past, patients were discouraged to take pictures of their ECG or radiographs. Thought should be given to encourage patients to use their mobile devices to keep electronic personal health records. The NHS app

Box 4 Patient/career instructions for emailing images to specialist for virtual clinic follow-up

- ▶ Include patient details (name, hospital number and date of birth) or image of patient label/armband as part of the email.
- ▶ Include patient/career contact details: mobile/landline number and email address to be contacted for follow-up.
- ▶ Attach image of the lesion (consider including measuring tape/ruler next to lesion).

library lists two held electronic personal health records apps: Evergreen Life and Patients Know Best. In the interim, smartphone photography of ECGs or medication charts may be an alternative.

Any advice given to the patient or action taken as a result of discussion of the case with a specialist needs to be documented contemporaneously in the patients notes.⁷

Case: part 3

Forty-eight hours later, the patient returns for review at your minor injuries clinic. You call the burns team for advice. They request a video consultation with the patient.

Around the world, telemedicine service with video consultations are used.^{4 5} NHS Digital has released a general guidance for video conferencing⁷. Both clinicians and patients need to be aware of the limits and risks and agree to those. Patients need to have access to a private space were confidential or sensitive information can be discussed. Backup for face-to-face consultation needs to be available; this is especially important if issues such as safeguarding arise during the video consultation. Guidance for breaking bad news via video consultation is available from Australia⁵ (box 5).

Case: part 4

Your mobile device got stolen/lost and you still have confidential patient images on it. What do you do?

Box 5 Consultations via videoconferencing

- ▶ Even in an encrypted format, ensure that both patients and staff are aware that online services are not 100% secure.
- ▶ Ensure patients are aware that the reliability, quality or security of the service lies with the third-party services such as FaceTime and Skype.
- ▶ Ensure that there are alternatives available in case of poor-quality internet connection or if any issues arise during the video consultation, which requires face-to-face consultation.
- ▶ Video consultations should not be recorded and General Medical Council UK (GMC) guidance on video and audio recordings applies.

As previously highlighted storage of patient identifiable information on clinicians' personal mobile devices should be avoided if possible. Images should ideally be deleted immediately from the device after advice has been sought or, if possible, uploaded to patients' electronic medical record. The device and the messaging software used should have the ability to be wiped remotely as soon as possible in case of a suspected data breach as per NHS Digital BYOD guidance. In the case of the device being lost or stolen, the local IT department needs to be informed as soon as possible for BYOD registered devices to have their data erased.⁷ Clinicians must be aware of these risks when using personal mobile devices (box 3).

CONCLUSION

This short paper highlights the use of medical apps in clinical practice and the potential resulting logistical and governance issues. There are risks to using these devices but also many benefits, and we should be transparent with families, carers, children and young people about these.

Twitter Damian Roland @damian_roland and Mark D Lyttle @mdlyttle

Contributors GR-S: idea, drafting of the manuscript. WB and MDL: review. DR: drafting of the manuscript, review. HKJ: idea, case, drafting of the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Test your knowledge

- Are you allowed to use apps at work?
 - Yes, this is your personal choice.
 - It depends on local mobile device guidance.
 - While use of instant messaging apps is discouraged, use of nationally endorsed apps such as the BNF/BNFc formulary app is generally acceptable.
 - Only the use of WhatsApp is illegal; I can use Viber or Snapchat to communicate patient identifiable information.
- Are apps safe and reliable to use?
 - If the app is Medicines and Healthcare products Regulatory Agency (MHRA) registered as a Medical Device.
 - If the app is endorsed by a trusted body, for example, Royal College of Paediatrics & Child Health (RCPCH) growth charts app.
 - All apps on the Appstore or Android store are safe and reliable.
 - All instant messaging apps are secure; therefore, I can use them to share patient images with my colleagues.
- How can I tell if an app is up to date?
 - All medical apps on the Appstore are registered with MHRA as medical devices.
 - All medical apps on the Google Play are registered with MHRA as medical devices.
 - If the app is MHRA registered as a medical device, CE (EU certification mark) marked and available for download on the Appstore.
- Can I use social media and instant messaging services to communicate with colleagues when seeking patient management advice?
 - I should seek verbal advice prior to taken any photographs of a patient and written advice for patient identifiable images such as the face.
 - I can share confidential patient images with my colleagues; however, I like and post them on my Facebook page.
 - I can share patient images, for example, of a burn of a patient's face in the trainee WhatsApp group, if I need advice.
 - I should be using the secure specialist messaging app, that is endorsed by my trust to share any confidential patient images, when seeking patient management advice from other teams, for example, burns or dermatology. I should only do this after I have obtained the appropriate consent from the patient.
- Are any of these apps endorsed by governing bodies?
 - WhatsApp.
 - iResus app.
 - ATLS app.
- When can an app improve the quality of the care I give?
 - Apps have been shown to be superior in paediatric inotrope prescribing than the use of a hardcopy paediatric formulary.
 - Burns app is more accurate in burn area estimation and fluid prescribing than paper charts.
 - Apps can improve antibiotic stewardship.

Answers to the quiz are at the end of the references.

Patient consent for publication Not required.

Provenance and peer review Commissioned; externally peer reviewed.

Data availability statement There are no data in this work

ORCID iDs

Damian Roland <http://orcid.org/0000-0001-9334-5144>

Haiko Kurt Jahn <http://orcid.org/0000-0003-2308-1221>

REFERENCES

- 1 Flannigan C, McAloon J. Students prescribing emergency drug infusions utilising smartphones outperform consultants using BNFCs. *Resuscitation* 2011;82:1424–7.
- 2 Baldwin JL, Singh H, Sittig DF, *et al.* Patient portals and health apps: pitfalls, promises, and what one might learn from the other. *Healthc* 2017;5:81–5.
- 3 WHO. Kay M, Santos J, Takane M, eds. *mHealth: new horizons for health through mobile technologies: second global survey on eHealth*. WHO, 2011.
- 4 Haimi M, Brammli-Greenberg S, Waisman Y, *et al.* Physicians' experiences, attitudes and challenges in a pediatric telemedicine service. *Pediatr Res* 2018;84:650–6.
- 5 Sabesan S, Williams M. Ep57: The Art of Telehealth RACP: RACP Pomegranate Health; [Podcast], 2020. Available: <https://www.racp.edu.au/pomegranate/View/ep57-the-art-of-telehealth>
- 6 Rowland SP, Fitzgerald JE, Holme T, *et al.* What is the clinical value of mHealth for patients? *NPJ Digit Med* 2020;3:4.
- 7 NHS Digital. Information governance and technology resources, 2020. Available: <https://digital.nhs.uk/data-and-information/looking-after-information/data-security-and-information-governance/information-governance-alliance-iga/information-governance-resources/information-governance-and-technology-resources>
- 8 Royal College of Nursing. Nursing staff using personal mobile phones for work purposes, 2016. Available: <https://www.rcn.org.uk/professional-development/publications/pub-005705>
- 9 Manning K AW. Information and technology for better care health and social care information centre strategy 2015–2020: health and social care information centre strategy, 2015. Available: <https://digital.nhs.uk/binaries/content/assets/legacy/pdf/c/c/hscic-strategy-2015-2020-final-310315.pdf>
- 10 Martin C. Instant messaging in the NHS: an exploration of the relationship between consumer messaging applications and modern healthcare delivery.: common time, 2018. Available: <https://www.commontime.com/uploads/webpage-documents/bdbb33eb-d290-4c35-9d90-182edacf317a.pdf>
- 11 O'Sullivan DM. WhatsApp doc? 2017;3.
- 12 Lovell T. WhatsApp use in the NHS a 'privacy and clinical safety timebomb': Mobi Health News, 2019. Available: <https://www.mobihealthnews.com/content/whatsapp-use-nhs-%E2%80%98privacy-and-clinical-safety-timebomb%E2%80%99>
- 13 MHRA. Medical devices regulation and safety, 2018. Available: <https://www.gov.uk/topic/medicines-medical-devices-blood/medical-devices-regulation-safety>
- 14 Barnes J, Duffy A, Hamnett N, *et al.* The Mersey burns APP: evolving a model of validation. *Emerg Med J* 2015;32:637–41.
- 15 Bates DW, Landman A, Levine DM. Health Apps and health policy: what is needed? *JAMA* 2018;320:1975–6.
- 16 Siebert JN, Ehrler F, Combescure C, *et al.* A mobile device application to reduce medication errors and time to drug delivery during simulated paediatric cardiopulmonary resuscitation: a multicentre, randomised, controlled, crossover trial. *Lancet Child Adolesc Health* 2019;3:303–11.
- 17 Panesar P, Jones A, Aldous A, *et al.* Attitudes and behaviours to antimicrobial prescribing following introduction of a smartphone APP. *PLoS One* 2016;11:e0154202.
- 18 Jahn HK, Jahn IH, Roland D, *et al.* Mobile device and app use in paediatric emergency care: a survey of departmental practice in the UK and Ireland. *Arch Dis Child* 2019;104:1203–7.
- 19 Lee TT, Kesselheim AS. U.S. food and drug administration Precertification pilot program for digital health software: weighing the benefits and risks. *Ann Intern Med* 2018;168:730–2.
- 20 Hardyman W, Bullock A, Carter-Ingram S, *et al.* *eLearning in health conference: collaboration, sharing and sustainability in the current environment. The iDoc project: using smartphone technology with Foundation doctors across Wales*. Birmingham: University of Aston, 2011.
- 21 Moran C. WhatsApp. *Email, Personal Communications, National Trauma Network UK* 2018.
- 22 Lovell T. WhatsApp use in the NHS a 'privacy and clinical safety timebomb'. Mobi Health News, 2019.
- 23 S J. *UK guidance on the use of mobile photographic devices in dermatology*. British Association of Dermatologists, 2017.

Answers to the multiple choice questions

1. C. Are you allowed to use apps at work?
 - a. Yes. This is your personal choice.
 - i. False. This depends on your local guidance.
 - b. It depends on local mobile device guidance.
 - i. True. You should be following your local guidance.
 - b. While use of instant messaging apps it is discouraged, use of national endorsed formulary apps such as the BNF/BNFc app is generally acceptable.
 - i. True.
 - b. Only the use of WhatsApp is illegal; I can use Viber or Snapchat to communicate patient identifiable information.
 - i. False. Use of specialist secure messaging apps or NHS email is encouraged; instant messaging apps should only be used if there is no alternative available.
2. A, B. Are apps safe and reliable to use?
 - a. If the app is MHRA registered as a Medical Device.
 - i. True. This means that the app is updated, and any issues can be raised via yellow card scheme.
 - b. If the app is endorsed by a trusted body, for example, Royal College of Paediatrics & Child Health (RCPCH) growth charts app.
 - i. True. Generally, apps endorsed by a trusted body are safe and secure and tested.
 - b. All apps on the Appstore or Android store are safe and reliable.
 - i. False. This does not ensure that the app is up to date or has been tested, nor CE marked.
 - b. All instant messaging apps are secure; therefore, I can use them to share patient images with my colleagues.
 - i. False. Instant messaging apps should only be used as last resort, if no other alternatives, for example, NHS email or secure specialist messaging apps, are available.
3. C. How can I tell if an app is up to date?
 - a. All medical apps on Appstore are registered with MHRA as medical devices.
 - i. False. Not all medical apps on Appstore are MHRA registered.
 - b. All medical apps on Google Play are registered with MHRA as medical devices.
 - i. False. Not all medical apps on Google Play are MHRA registered.
 - b. If the app is MHRA registered as medical device, GE marked and available for download on the Appstore.
 - i. True.
4. A, D. Can I use social media and instant messaging services to communicate with colleagues when seeking patient management advice?
 - a. I should seek verbal advice prior to taken any photographs of a patient and written advice for patient identifiable images such as the face.
 - i. True, good practice according to British Dermatology Association guidance.
 - b. I can share confidential patient images with my colleagues however I like and post them on my Facebook page.
 - i. False. See NHS Digital and GMC guidance.
 - b. I can share patient images, for example, of a burn of a patient's face in the trainee WhatsApp group, if I need advice.
 - i. False. WhatsApp should only be used for team communication and not for patient identifiable information. Instant messenger services may be used for direct communication with specialist for advice if there are no alternatives available.
 - b. I should be using the secure specialist trust endorsed messaging app to share any confidential patient images after obtaining consent from the patient when seeking patient management advice from other teams, for example, burns and dermatology.
 - i. True, or NHS email, or ask patient to email the specialist directly.
5. A, B, C. Are any of these apps endorsed by governing bodies?
 - a. WhatsApp.
 - i. True, for team communication only, Trauma Network UK.
 - b. iResus app
 - i. True, Resus Council UK.
 - b. ATLS app.
 - i. True, ATLS.
6. A, B, C. When can an app improve the quality of the care I give?
 - a. Apps have been shown to be superior in paediatric inotrope prescribing than the use of a hardcopy paediatric formulary.
 - i. True, PICU calculator /Paediatric Emergencies app and PedAMINES apps.
 - b. Burns app is more accurate in burn area estimation and fluid prescribing than paper charts.
 - i. True, Mersey Burns app.
 - b. Apps can improve antibiotic stewardship.
 - i. True, Microguide app.