

**Smartphone use in dermatology for
clinical photography and consultation:
A study of current practice and the law**

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Abstract

Smartphones are changing the way doctors communicate with each other, by enabling instant capture and transmission of high-quality clinical images for specialist review. This increase in transmission of clinical images is occurring in the absence of reflection about whether smartphone review is the most appropriate way of assessing the patient in the circumstances, and the risk that smartphone review may potentially compromise clinical care and security of patient information. There is also a lack of clarity as to when a duty of care may arise on the part of the recipient of clinical images, and what is required to discharge that duty.

Although smartphone consultations are increasingly taking place across a number of medical and surgical specialties worldwide, the practice is particularly prevalent in dermatology due to the highly visual nature of the specialty. This thesis investigates current clinical practices regarding smartphone use in dermatology through a survey and qualitative interviews with Australian dermatologists and dermatology trainees, and examines the medicolegal implications, with a particular focus on questions of liability in negligence. It also considers questions of patient privacy and consent to undergo clinical photography and to be reviewed via telemedicine. The thesis then proposes practical solutions to address the limitations of smartphone clinical use, with a focus on software integration, education and a pragmatic approach to policy.

Statement of Originality

This is to certify that to the best of my knowledge, the content of this thesis is my own work. This thesis has not been submitted for any degree or other purposes. I certify that the intellectual content of this thesis is the product of my own work and that all the assistance received in preparing this thesis and sources have been acknowledged.

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Outline

Smartphones are changing the way doctors communicate with each other. In an era of continually improving image quality and unprecedented connectivity, the capture and transmission of clinical images for specialist review has become incredibly efficient. The potential benefits of almost instant access to specialist opinion are many, including improved triage,¹ decreased time to diagnosis and treatment,² and increased access to care for rural and remote patients.³ However, alongside the increase in convenience comes a decrease in opportunities to reflect on the appropriateness of smartphone use, and the ways in which clinical care may be compromised.

Whilst smartphone consultations are increasingly taking place across a number of medical⁴ and surgical specialties⁵ worldwide, the practice is particularly prevalent in dermatology due to its highly visual nature. This thesis investigates current clinical practices regarding smartphone use in dermatology through a survey and qualitative interviews with Australian dermatologists, and examines the medicolegal implications, focusing on questions of liability in negligence. It then considers the role of law reform in improving clinical practice, and proposes practical solutions to address the limitations of smartphone clinical use, with a focus on software integration, education and a pragmatic approach to policy.

¹ Jim Muir and Lex Lucas, 'Tele-dermatology in Australia' (2008) 131 *Studies in Health Technology and Informatics* 245-253

² Anna Finnane et al, 'Teledermatology for the Diagnosis and Management of Skin Cancer: A Systematic Review' (2017) 153(3) *JAMA Dermatology*, 319-327

³ Jane Hollins, Craig Veitch and Richard Hays, 'Interpractitioner communication: telephone consultations between rural general practitioners and specialists' (2000) 8(4) *Australian Journal of Rural Health* 227-31

⁴ Michael Kirk et al, 'The role of smartphones in the recording and dissemination of medical images' (2014) 3(2) *Journal of Mobile Technology in Medicine* 40-45; Gemma Nesbitt and Clare Collins, 'An evaluation of current clinical photography practice in tertiary neonatal intensive care units and the influence of smart phone technology' [71] (2017) 53 *Journal of Paediatrics and Child Health*; Taha El Hadidy et al, 'Smartphones in clinical practice: doctors' experience at two Dublin paediatric teaching hospitals' (2018) 187(3) *Irish Journal of Medical Science* 565-573

⁵ Jeremy Djjan et al, 'Clinical photography by smartphone in plastic surgery and protection of personal data: Development of a secured platform and application on 979 patients' [2019] (2018) 64(1) *Annales de chirurgie plastique esthétique* 33-43; Osman Kelahmetoglu, Remzi Firinciogullari and Caglayan Yagmur, 'Efficient Utility of WhatsApp: From Computer Screen to the Surgeon's Hand to Determine Maxillofacial Traumas' (2015) 26(4) *Journal of Craniofacial Surgery* 1437; G. A. Naqvi et al, 'Smart consultation for musculoskeletal trauma: accuracy of using smart phones for fracture diagnosis' (2014) 12(1) *The Surgeon: Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland* 32-34

Chapter 1 provides context to the practice of dermatology in Australia, against which smartphone use for clinical review is to be compared. It provides an examination of the validity of formal and informal teledermatology to triage, diagnose and manage dermatological conditions, and discusses why smartphone teledermatology has assumed an important role in current practice.

Chapter 2 investigates current practice regarding smartphone use for clinical images through a survey of Australian dermatologists and dermatology trainees, and through qualitative interviews with representatives from these groups. The data indicates smartphone consultations occur routinely in dermatology, and the practice is highly valued by dermatologists and trainees. Clinical images are used to compensate for the lack of dermatological training and experience of the referring doctor. For dermatology trainees, this includes emergency doctors, junior doctors from other departments in the hospital, and GPs. Dermatology consultants also routinely receive images from dermatology trainees. The data also indicates current practices are unlikely to be sufficient to comply with privacy legislation, and practices relating to documentation and consent are poorly managed at present.

Chapter 3 examines the ways in which clinical smartphone use may create medicolegal risks in the state of New South Wales. Scenarios are used to highlight the ambiguity regarding when a duty of care may arise in the context of a smartphone consultation, the standard of care to be applied, and whether a defence may be available under s 50 of the Civil Liability Act 2002 (NSW). The scenarios also illustrate how employers may be vicariously liable for errors arising out of smartphone consultations, even in circumstances where smartphone use has been prohibited by the workplace or state health department policy.

Chapter 4 considers privacy risks under applicable legislation, and outlines technological and practical solutions to improve patient privacy, documentation and capture of the consent process through purpose-built smartphone applications (“apps”). The discussion of privacy

is reserved for Chapter 4 because the legal framework provides the context against which to assess practical solutions for transmission and upload of clinical images. An examination of the barriers to implementation of these solutions follows. It recommends steps that could be taken at a variety of levels to enable efficient transmission and uploading of images to the medical record throughout the Australian healthcare system, in a manner that complies with the requirements of privacy legislation.

Chapter 5 advocates for a proactive approach so as to retain the benefits of smartphone consultations, whilst minimising legal risks. Institutional support through the provision of realistic policy, software solutions and adequate wireless internet and cellular coverage would be required to encourage optimal smartphone use.

This thesis focuses on communication of clinical images between doctors for clinical purposes. It does not address deliberate misuse of clinical images for non-clinical purposes, nor does it discuss posting of clinical images to social media without patient consent. Direct contact between patients and dermatologists through smartphone apps is briefly addressed, but is not the major focus of this paper and would be an appropriate subject for further investigation in future research.

Chapter 1: Introduction

1.1 Why do smartphone consultations warrant closer attention?

Doctors have always asked colleagues, mentors and specialists for assistance with diagnosing and managing patients. The ability to do so is important both for patient safety and for professional development. This process may be formal (a referral for a “consultation”) or informal (a “curbside” or “corridor” consultation). Where the process is informal, advice is usually provided in general terms, without the provision of patient specific details. Practitioners would ordinarily be liable for advice provided regarding a formal consultation, whereas curbside consultations have not previously been recognised to create a duty of care⁶. The ability to almost instantly receive specialist advice on the basis of high-quality images and a limited patient history effectively blurs the line between formal and curbside consultations, creating ambiguity as to when a duty of care arises.

The medicolegal risks associated with smartphone consultations are compounded by an increased risk of medical error. Formal teledermatology programs have developed slowly over time, enabling appropriate systems to be designed to address many of the associated risks. This includes incorporating a process to obtain and document patient consent, ensuring secure transmission of patient data and obtaining and documenting a thorough patient history. In contrast, the informality and variability of smartphone communication offers little opportunity for reflection on, and reduction of, risks to patient safety. Clinical images are often stored on the smartphone devices of individual practitioners. This may result in fragmentation of the medical record, exposing the patient to breach of privacy and compromising the practitioner’s legal position should any medical negligence or disciplinary proceedings arise. Additionally, with the ease of transmission of images, the quality of written clinical information is declining⁷ both in the patient file and in communications

⁶ See Chapter 3 for further discussion

⁷ See Chapter 2 for supporting data and further discussion

between practitioners. This is particularly concerning if the relevant clinical images are never uploaded to the patient file, leaving it less comprehensive than if no photograph had been taken at all.

Although no cases involving professional negligence arising from a smartphone consultation have been decided in Australia to date, given the frequency and volume of such communications, it is only a matter of time before courts are asked to determine questions of liability within the context of this rapidly evolving clinical practice⁸. Nonetheless, prohibiting the use of smartphones for transmission of clinical images is neither practical, nor desirable. Several studies have established that practitioners believe the ability to transmit clinical images improves patient care, and is clinically important to their practice⁹. Accordingly, the practice is likely to continue, regardless of any prohibitive workplace or state health department policies. Instead of prohibiting smartphone interactions between doctors, the quality of the process should be improved by acknowledging its existence and utility, and providing adequate software, education, training and policy to ensure appropriate use.

1.2 The practice of dermatology in Australia

Dermatology is the specialist branch of medicine dedicated to diagnosis, treatment, and prevention of diseases of the skin, hair, nails, oral cavity and genitals. This encompasses everything from non-urgent skin conditions such as acne (which may nonetheless significantly impact upon quality of life), to life-threatening adverse drug reactions involving

⁸ It is entirely possible that claims of professional negligence arising from a smartphone consultation have arisen, but have been settled out of court, as most medical negligence claims settle without a formal court order. In NSW from July 2012 to June 2013, only 5.2% of medical indemnity claims in the public sector were decided by a court, with the remainder being either settled (61.4%) or discontinued (33.4%): Australian Institute of Health and Welfare 2014, 'Australia's medical indemnity claims 2012–13' (Safety and quality of healthcare series no. 15, Cat. no. HSE 149), Canberra: AIHW, p19. Available at < <https://www.aihw.gov.au/getmedia/27797a0e-490e-4ef9-bf63-91917fca7208/17533.pdf.aspx?inline=true>>

⁹ Jessica Mounessa et al, 'A systematic review of satisfaction with teledermatology' (2018) 24(4) *Journal of Telemedicine and Telecare* 263-270; Finnane et al, 'Teledermatology for the Diagnosis and Management of Skin Cancer: A Systematic Review' (n 2)

widespread skin erosions. Dermatological conditions represent 17 out of every 100 presentations to general practitioners, and make up 8% of referrals for specialist opinion¹⁰.

In Australia, to become a dermatologist and a fellow of the Australasian College of Dermatologists (FACD), a medical practitioner must complete medical school, two years of generalist undergraduate training (for example, intern year and resident training), and once accepted onto the Australasian College of Dermatologists' (hereafter referred to as "the College") training program, must then complete 4 years of supervised training and pass examinations set by the College¹¹. At present there are 527 fellows and 113 trainees in Australia¹². Approximately 92% of dermatologists practice in metropolitan areas, with low regional representation and very limited rural and remote representation¹³.

Whilst there is a curriculum set at the national level, decisions regarding training placements occur at the state faculty level, and decisions about the degree of experience required to allow trainees to be rostered on-call varies across training locations. Trainee placements take place primarily in the public hospital system, with a small proportion of rotations taking place in private practice. Training involves a combination of supervised participation in outpatient dermatology clinics, where patients attend booked appointments, and supervised care of inpatients who may have been admitted directly under the dermatology team, or admitted under another team who has requested specialist dermatological input (a "consultation").

¹⁰ Family Medicine Research Centre, University of Sydney, 'General Practice Activity in Australia 2015-16' (General Practice Series volume 40, University of Sydney, September 2016), Available at <purl.library.usyd.edu.au/sup/9781743325131>

¹¹ 'The Training Program', *The Australasian College of Dermatologists* <<https://www.dermcoll.edu.au/training-and-education/training-program/>>, accessed on 12 February 2019

¹² Australasian College of Dermatologists, '2018 Annual Report' (2018) <https://www.dermcoll.edu.au/acdcopy/wp-content/uploads/CD1594-AUST-COLLEGE-OF-DERMATOLOGISTS-ANNUAL-REPORT-high_res_single.pdf> at [5]

¹³ See Department of Health, 'Australia's Future Health Workforce – Dermatology' (May 2017)

1.2 (a) Access to dermatology services in the private system

Patients may access dermatologists in the private system directly, although a referral is required from another doctor for the patient to receive a Medicare rebate for the specialist consultation. Referrals are typically typed and mailed, faxed or emailed to the dermatologist, and usually include detailed clinical information. Many skin conditions are seen and managed in the first instance by general practitioners, including acne, skin cancer, eczema and psoriasis. Patients who have severe conditions or who have not responded to initial treatment often require dermatological review. Dermatologists who practice in the private sphere report that they are increasingly receiving photographs via email or smartphone from general practitioners, often to request advice on the urgency or timeframe of dermatological review. However, the frequency of these requests from GPs pales in comparison to the barrage of smartphone images received by dermatology trainees in the public system. As a result, this paper will largely focus on smartphone interactions within the public hospital system.

1.2 (b) Access to dermatology services in the public system

The public hospital system in Australia, as is the case in Canada, the United Kingdom and the United States of America, relies heavily on junior doctors to deliver care to inpatients, especially during periods outside of office hours (“after-hours”)¹⁴. The category of junior doctors (for the purposes of this thesis) includes interns (postgraduate year, “PGY” 1), residents (PGY2+) and accredited or unaccredited registrars (PGY2+), with accredited registrars being trainees that have been accepted onto a specialty training pathway. Such placements are intended to deliver services to large numbers of patients, whilst also offering sufficient supervision to develop the junior doctor’s skills and knowledge.

¹⁴ John Temple, 'Resident duty hours around the globe: where are we now?' (2014) 14(1) *BMC Medical Education* S8 at page 4; Australian Medical Association, 'Junior Doctor Training, Education and Supervision survey - report of findings' (March 2013) at <https://ama.com.au/sites/default/files/documents/AMA_junior_doctor_survey_2012_final.pdf>

When dermatological input is required regarding an inpatient during office hours, it is usually sought through a request for a dermatological consultation. Although the decision to request a consultation is usually made by the senior consultant of the admitting team, a more junior member of the admitting team usually submits the request. This is done either by completing a formal request on paper or, more commonly, through an electronic referral request within the Electronic Medical Record (“EMR”) system. Dermatology trainees are ordinarily the first point of contact for consultations, although the consultant on call for the shift retains ultimate responsibility for supervising their registrars and determining management.

During after-hours shifts it is often the least experienced doctors in the hospital who are first called to review a sick patient¹⁵. Consultants are generally not physically present in the hospital precinct at night (with the exception of the Emergency Department and Intensive Care Unit consultants), although they may be required to attend under the terms of their contract and may be under a professional obligation to do so if requested. A means of obtaining adequate guidance and clinical advice from registrars and supervisors from a distance is required¹⁶. Requests for dermatological advice are made to the dermatology trainee on call, if there is in fact any on-call dermatology service (several major hospitals in NSW do not have access to an after-hours dermatology service). Requests for consultations after-hours were previously made via phone or pager for a dermatology registrar to attend to the patient in person at an appropriate time. With the arrival of smartphones, casual requests for review of images are increasingly being made at all hours, even for non-urgent matters. It is no longer clear whether these requests constitute a ‘curbside consultation’ or are more akin to a formal request to attend in person for review, given the casual nature of smartphone interactions.

¹⁵ Craig Hore, William Lancashire and Robert Fassett, 'Clinical supervision by consultants in teaching hospitals' (2009) 191(4) *Medical Journal of Australia* 220-2

¹⁶ At present, patients with serious medical conditions are more likely to die in hospital if they are admitted on a weekend as compared to a weekday – although many factors may be at play, one might suspect that the lack of senior doctors on-site plays a role. See: Chaim Bell and Donald Redelmeier, 'Mortality among patients admitted to hospitals on weekends as compared with weekdays' (2001) 345(9) *New England Journal of Medicine* 663-8

1.3 Tele dermatology

Tele dermatology, a subcategory of telemedicine, has emerged over the last 20 years to provide a means of triage, referral, or diagnosis and management of patients who do not have access to a dermatologist within a reasonable geographic distance or timeframe. This method of providing dermatological advice continues to gain prominence in the United Kingdom, Europe, the United States¹⁷, Australia¹⁸ and New Zealand¹⁹. Tele dermatology involves obtaining a medical opinion from a practitioner who is not on-site. This takes place in a two-part process, store-and-forward telehealth (“SAF”), where information is captured and stored by the referrer or patient and subsequently forwarded to the clinician for review. This process is usually an asynchronous one, in that the capture of the information and the review and provision of advice by the recipient clinician take place at different points in time. At present SAF is not eligible for a Medicare rebate in Australia. A major disadvantage of SAF is that the recipient doctor must rely on the referring doctor to provide both sufficient and representative images, and to provide an accurate and complete history. There may also be extended delays between the request for and provision of advice.

Some of these issues may be mitigated by utilising video-conferencing, which is eligible for a Medicare rebate. This usually involves live streaming of a video of the patient who is often accompanied by a referring practitioner or nurse. This process is usually more time-consuming for practitioners, and may be less convenient than SAF due to scheduling requirements between practitioners. However it does allow recipient clinicians to probe for relevant history and examination findings as the patient is still in the room with the referring doctor. Reliance upon relatively poor-quality images obtained via video may be

¹⁷ Arick Trettel, Leah Eissing and Matthias Augustin, 'Telemedicine in dermatology: findings and experiences worldwide - a systematic literature review' (2018) 32(2) *Journal of the European Academy of Dermatology and Venereology* 215-224

¹⁸ Anna Finnane et al, 'The growth of a skin emergency tele dermatology service from 2008 to 2014' (2016) 57(1) *Australasian Journal of Dermatology* 14-8

¹⁹ Amanda Oakley et al, 'Patient cost-benefits of realtime tele dermatology--a comparison of data from Northern Ireland and New Zealand' (2000) 6 *Journal of Telemedicine and Telecare*; *ibid*

avoided by taking a hybrid approach, where high definition images are sent to the recipient clinician during, or prior to, the videoconference²⁰.

At present there are several teledermatology services in Australia, including the Skin Emergency Teledermatology Service (SETS) at the Princess Alexandra Hospital²¹ in Brisbane, Tele-DERM,²² DermoDirect²³ and TeleDermatologist²⁴. Each of these services invites teledermatology referrals and reportedly have formalised systems for capturing and documenting consent, sending referrals, protecting patient privacy and ensuring documentation of the process, as is required by current telehealth guidelines in Australia.²⁵ In contrast, the majority of informal teledermatology that takes place via smartphone is conducted on a casual basis between doctors in the course of their daily communications. The difficulty with this is that there are no established systems for documentation of advice, uploading of images, obtaining consent, ensuring security of transmission, and ensuring that referrals are logged and responded to and followed-up within an adequate time frame.

1.3 (a) Benefits of Teledermatology

Smartphone teledermatology has become a widespread practice in Australia for good reason – there are many benefits to immediate access to dermatological opinions based upon a representative image of the patient’s current condition. Although smartphone teledermatology lacks some of the safeguards that are built into formalised teledermatology, such as referral templates and consent forms, it still retains many of the benefits, such as reduced waiting times to assessment, diagnosis and management,²⁶ which

²⁰ Lisa Abbott et al, 'Practice guidelines for teledermatology in Australia' (2020) 61 (3) *Australasian Journal of Dermatology* 191 – 294

²¹ University of Queensland, Skin Emergency Teledermatology Service: see <<https://dermatology-research.centre.uq.edu.au/skin-emergency-teledermatology-service-sets>>

²² Australian College of Rural & Remote Medicine, "e-Health and Telehealth", 2018, available at <https://www.acrrm.org.au/rural-and-remote-medicine-resources/ehealth-and-telehealth>

²³ DermoDirect website, accessed 28 December 2018: <https://dermodirect.com.au/>

²⁴ Thea Cowie, 'Groundbreaking telehealth platform brings dermatology to far-flung Australia', *HealthCare IT News*<<https://www.healthcareit.com.au/article/groundbreaking-telehealth-platform-brings-dermatology-far-flung-australia>>

²⁵ NSW Agency for Clinical Innovation, 'Guidelines for the use of Telehealth for Clinical and Non Clinical Settings in NSW' (2015); Australian College of Rural and Remote Medicine, 'ACRRM Telehealth Guidelines' (2016); Medical Board of Australia, 'Technology-based patient consultations guideline' (2012)

²⁶ Mounessa et al (n9, Finnane et al, above n18 at 325)

is particularly important for patients who have a melanoma. The ability of general practitioners, emergency physicians and dermatology registrars to quickly access an opinion from a consultant dermatologist, or for dermatologists to obtain a second opinion from a sub-specialised dermatologist, may also have significant value in improving the accuracy of diagnosis²⁷. Such interactions also offer an educational opportunity on the part of the referring practitioners and registrars, who may receive speedy feedback regarding diagnosis, investigation and treatment of the problem referred.

When teledermatology is used as a triage mechanism rather than for diagnosis and management decisions, the benefits of the practice become more obvious, with one study finding that up to 60% of consultations were able to be safely triaged to the following day or further into the future as an outpatient²⁸. The ability to quickly triage non-urgent patients to be reviewed in an outpatient clinic with some interim management is particularly important in overburdened emergency departments, where dermatological complaints constitute 4-12% of presentations, each of which must be addressed within a relatively limited time period, regardless of actual urgency.

A systematic review assessing the cost-effectiveness of store-and-forward teledermatology reported that most studies indicated teledermatology is more cost-effective than conventional dermatology²⁹, although it should be noted that the underlying studies reviewed suffered from a number of methodological limitations. The actual cost-effectiveness will also be impacted by the degree of accuracy of teledermatology and the consequent impact on management decisions, in particular the capacity to minimise (or increase) morbidity and mortality arising from dermatological conditions. If diagnosis and management plans are accurate, the costs to the patient are also minimised through teledermatology. These include reductions in health care costs, travel costs and time

²⁷ Gian Lozzi et al, 'The additive value of second opinion teleconsulting in the management of patients with challenging inflammatory, neoplastic skin diseases: a best practice model in dermatology?' (2007) 21(1) *Journal of the European Academy of Dermatology and Venereology* 30-4

²⁸ John S. Barbieri et al, 'The reliability of teledermatology to triage inpatient dermatology consultations' (2014) 150(4) *Journal of the American Medical Association, Dermatology* 419-424

²⁹ Centaine Snoswell et al, 'Cost-effectiveness of Store-and-Forward Teledermatology: A Systematic Review' (2016) 152(6) *JAMA Dermatology* 702-8

associated with treatment, as well as potential reductions in lost productivity as a result of earlier diagnosis and treatment. The cost to individuals in the vicinity of the patient is also reduced in circumstances where infectious diseases, such as varicella, eczema herpeticum and scabies are correctly identified and treated via teledermatology. Additionally, patient satisfaction has been consistently reported to be high with mobile teledermatology³⁰, particularly for patients with chronic diseases.

1.3 (b) Accuracy and validity of teledermatology

The quality of photographs on smartphones is improving with very high-quality lenses in recent smartphone models³¹. The quality of the photograph may nonetheless be affected by a number of user factors, as well as the characteristics of certain locations or lesions. Mucosal lesions, orifices and hair-bearing skin, for example, require specific attention to lighting and exposure for accurate photography³². Lighting, including flash lighting, and background may also change the colour of skin lesions captured in images, providing an inaccurate reflection of the degree of erythema or pigmentation present³³. Additionally, the pixelated colour on the referring practitioner's smartphone screen may not match the colour that appears on the dermatologist's screen³⁴. The sample area photographed may not provide an accurate representation of the patient's overall condition. The degree of tissue edema may not be apparent due to the angle at which the photograph is taken. Some of these limitations may be overcome with further education on basic medical imaging techniques, and this will be discussed further in Chapter 5. Even where clinical photographs do meet the highest standards, the accuracy of mobile and regular teledermatology is not equivalent to face-to-face dermatology³⁵. A remote review of photographs cannot replace a thorough history and examination by an appropriately skilled practitioner. However, in the right circumstances, teledermatology may come close, or

³⁰ Susanne Kroemer et al, 'Mobile teledermatology for skin tumour screening: diagnostic accuracy of clinical and dermoscopic image tele-evaluation using cellular phones' (2011) 164(5) *British Journal of Dermatology* 973-979

³¹ See discussion at 1.4 (e) Future directions for teledermatology

³² Karen McKoy et al, 'Practice Guidelines for Teledermatology' (2016) 22(12) *Telemedicine and e-Health* 981-990

³³ *Ibid*

³⁴ Karalikkattil Ashique, Feroze Kaliyadan and Sanjeev J. Aurangabadkar, 'Clinical photography in dermatology using smartphones: An overview' (2015) 6(3) (2015/05/27) *Indian Dermatology Online Journal* 158-63; *ibid*

³⁵ Finnane et al (n18)

sometimes be better than the actual alternative available to an individual patient (who may not have immediate access to a conventional dermatological review).

A multitude of studies purporting to assess the accuracy of teledermatology and mobile teledermatology have been conducted over the last 15 years, with 2 systematic reviews of teledermatology published between 2009³⁶ and 2016³⁷ and one systematic review assessing only tertiary teledermatology³⁸(where referrals are received from other dermatologists). The most recent review by Finnane et al found that diagnostic accuracy for skin cancer (defined as agreement with histopathology when lesions are excised, or clinical diagnosis for non-excised lesions) was still higher in face-to-face dermatology (67%-85% agreement with reference standard, Cohen κ , 0.90) when compared with teledermatology (51%-85% agreement with reference standard, κ , 0.41-0.63). The wide range in reported accuracy between studies was considered likely due to methodological limitations, including small sample sizes, lack of histopathology as a reference standard, selection bias (for example, exclusion of low-quality images, or enrolling only high-risk patients) and diagnostic bias.

Further research is required to provide reliable data to address these biases and take into account inter-rater reliability, so that the technology itself can be more adequately assessed (separate from the skills of the dermatologists involved). It may also be important to separate out contexts in which teledermatology is to be used and assess its accuracy in those settings. For example, it may be instructive to take note of the level of training of the sender (patient, medical student, general practitioner or emergency physician, dermatology trainee or dermatologist) and the experience level of the recipient. The type of dermatological condition being assessed (for example, melanocytic lesions, non-melanocytic lesions and eruptions) and category of service (for example, for triage, diagnosis, management or monitoring of chronic conditions³⁹ or post-procedural progress⁴⁰) may also

³⁶ Erin M. Warshaw et al, 'Teledermatology for diagnosis and management of skin conditions: a systematic review' (2011) 64(4) *Journal of the American Academy of Dermatology* 759-772

³⁷ Finnane et al (n 2)

³⁸ Job P. van der Heijden et al, 'Tertiary Teledermatology: A Systematic Review' (2010) 16(1) *Telemedicine and e-Health* 56-62

³⁹ Julia Frühauf et al, 'Pilot study on the acceptance of mobile teledermatology for the home monitoring of high-need patients with psoriasis' (2012) 53(1) *The Australasian Journal of Dermatology* 41-46

⁴⁰ Shien-Ning Chee, Patricia Lowe and Adrian Lim, 'Smartphone patient monitoring post-laser resurfacing' (2017) 58(4) *Australasian Journal of Dermatology* e216-e222

play significant roles. Whether the dermatologist has a prior familiarity with the patient and their condition may also be a factor in the ability to accurately interpret images. This is acknowledged in Germany, where telemedical services provided by a doctor are only lawful as a follow-up treatment after an initial face-to-face examination by the same doctor has been conducted⁴¹.

Whilst the systematic reviews by Warshaw et al and Finnane et al reported similar findings regarding accuracy, they reached different conclusions about whether teledermatology is sufficiently reliable to replace conventional dermatology. There remains ambiguity regarding what is required in terms of informed consent when performing telemedicine consultations. Whether teledermatology is an appropriate method of assessment to meet the standard of care in medical negligence and disciplinary proceedings will be a matter for expert opinion, and that opinion may vary depending on the referrer, recipient, patient factors, location, availability of other services and the extent of services offered through teledermatology (see Chapter 3 for more on this topic).

1.4 Evolving communication between medical practitioners

1.4 (a) Telephone communication without provision of clinical images

Prior to smartphones becoming ubiquitous amongst medical practitioners, dermatology trainees and dermatologists were reliant upon discussion over a telephone call to ascertain the urgency of dermatological review and to provide interim advice to junior or non-dermatological doctors. Dermatology consultations are frequently requested by telephone after-hours. Unfortunately junior and emergency doctors often lack the clinical terminology to accurately describe what they see, because dermatology teaching is extremely limited at present in most medical schools in Australia⁴². The overwhelming feedback from interviews

⁴¹ Sec. 8 (4) of the Model Professional Code for Doctors (*Musterberufsordnung der Ärzte – MBO-Ä*)

⁴² Anita Gupta et al, 'Dermatology teaching in Australian Medical Schools' (2017) 58(3) *Australasian Journal of Dermatology* 73-78

conducted in the course of this thesis research was that relying on verbal descriptions alone from junior doctors and emergency physicians was not likely to lead to a correct diagnosis:

“The problem is when you have ED doctors... they’ll describe things and you imagine the morphology⁴³ in your head which is totally incorrect... I feel like the smartphone has been essential for me to successfully deal with consults over the phone. Because without it, I mean, honestly? I’m telling you, like 9.9 times out of ten, they are incorrect with their morphology. So you can’t trust anything that they say. So you need it⁴⁴ .”

1.4 (b) Use of smartphones to capture and transmit clinical photography

Prior to widespread smartphone usage in medical settings, photographs would either not be routinely taken, or taken on a camera and either printed and added to a paper file or uploaded to an electronic medical record or associated database. Over the past 5 years, papers have been published around the world assessing how clinicians use their smartphones across a number of specialties (see discussion in Chapter 2). Generally, the findings reported elsewhere are consistent with the findings of the empirical study forming part of this thesis. Key findings from this study, presented in chapter 2, are that clinicians are regularly using non-secure methods to transmit patient images and information, usually SMS, Whatsapp or email. Consent is often not obtained for transmission, storage and other uses of patient images, and photographs are rarely uploaded to the patient’s file. Mobile coverage within hospitals is improving over time, although in some workplaces restrictions still remain over use of mobile phones near sensitive and complex medical equipment due to concerns of interference (although those risks appear to be very limited).

The option of using email through a secure private clinic or hospital server to contact another recipient on the same server may allow for safe, encrypted transmission of clinical images and patient data. However, there is no way to assess whether emails are being

⁴³ Morphology in dermatology refers to the description of the nature of the lesion or eruption (in particular, the shape, colour, elevation, presence of blisters or fluid etc.)

⁴⁴ Interview 3, Consultant Dermatologist

viewed on a secure device, or saved to a secure server (as opposed to storage on an individual's smartphone device). One advantage of email viewed on a laptop or desktop computer is that it may be somewhat easier to transfer clinical images and communications directly to the electronic medical record than it is to do so from a smartphone. Images and communications that take place over email are otherwise likely to be subject to the same pitfalls as those sent by smartphone, outlined below.

1.4 (c) Smartphone dermoscopy

Smartphone dermoscopic photography has become accessible and affordable in recent years. Conventional dermatoscopes may be used with a smartphone attachment on commercially available cases, or pocket-sized dermoscopic lenses may be placed over the smartphone camera (8 models available at the time of writing)⁴⁵, ranging from AUD\$30.00 - \$2065.00. Adding smartphone teledermoscopy to store-and-forward referrals has the potential to significantly increase accuracy, particularly when undertaking triage of skin-cancer referrals for pigmented lesions.⁴⁶

1.4 (d) Purpose-built clinical smartphone apps

A number of purpose-built applications ("apps") have emerged on the market aiming primarily to protect patient privacy in the course of communication between doctors. These may be stand-alone apps that do not integrate with patient records, and may be sufficient for private practitioners or those who receive very few smartphone communications regarding patients. Alternatively they may be designed specifically to integrate with a particular vendor's chosen platform for health records. In addition to protecting patient privacy, such apps may enhance the ability to transfer patient images directly to the medical

⁴⁵ Anthony Yung, 'Dermatoscope overview', available at <<https://www.dermnetnz.org/topics/dermatoscope-overview/>>

⁴⁶ Kroemer et al (n30); Alexander Börve et al, 'Smartphone teledermoscopy referrals: a novel process for improved triage of skin cancer patients' (2015) 95(2) *Acta Dermato-Venereologica* 186-190; Eugene Tan et al, 'Successful triage of patients referred to a skin lesion clinic using teledermoscopy (IMAGE IT trial)' (2010) 162(4) *British Journal of Dermatology* 803-811

record, contain a checklist for consent and space for patient signature on the mobile device, and provide a pro-forma for referral. This may include essential questions such as the existence of red-flag features (such as fever and immunosuppression) and a reminder system to ensure follow-up takes place. Such apps are not yet used commonly in Australia, and a discussion about some barriers to the uptake and implementation of secure apps is discussed in detail in Chapter 4.

1.4 (e) Future directions for tele dermatology

As technology continues to rapidly develop, tele dermatology will likely evolve with it. Video-conferencing may be further enhanced and made more commonplace by use of devices like Google Glass, which is set to be re-released in the near future in an Enterprise Edition aimed at healthcare, amongst other industries⁴⁷. Images may be captured hands-free⁴⁸ with Google Glass, giving rise to even more complicated questions about consent and patient privacy. The addition of haptic rendering⁴⁹ of microscopic images, which would add the sensation of touch to the consultation and essentially enable virtual palpation,⁵⁰ may enhance the ability to provide remote advice.

Another area of rapid development in dermatology is artificial intelligence. Deep neural networks have recently been demonstrated to be as, or more accurate, than board-certified dermatologists in diagnosing pigmented lesions⁵¹. It is therefore possible that dermatologists will be bypassed altogether, and GPs will instead ask their smartphones to diagnose the lesion on the basis of uploaded images⁵². The degree of trust we decide to

⁴⁷ Rory Cellan-Jones, 'Google Glass smart eyewear returns', *BBC News* (London, 18 July 2017) available at <<http://www.bbc.com/news/technology-40644195>>

⁴⁸ Gabriel Aldaz et al, 'Hands-free image capture, data tagging and transfer using Google Glass: a pilot study for improved wound care management' (2015) 10(4) (2015/04/23) *PLoS One* e0121179

⁴⁹ Haptic rendering involves a virtual recreation of the tactile sensation and reaction forces of a physical object – in this case, a lesion on the patient's skin

⁵⁰ Kwangtaek Kim, 'Haptic augmented skin surface generation toward telepalpation from a mobile skin image' (2018) 24(2) *Skin Research and Technology* 203-212

⁵¹ Holger A. Haenssle et al, 'Man against machine: diagnostic performance of a deep learning convolutional neural network for dermoscopic melanoma recognition in comparison to 58 dermatologists' (2018) *Annals of Oncology* 1836 – 1842

⁵² DeepMind Technologies Limited, Why Doesn't Streams Use AI? <<https://deepmind.com/blog/streams-and-ai/>>

place in AI, and the degree of funding we give to organisations designed to test, validate and regulate new health technologies will impact upon the speed with which AI is adopted by clinicians, and made available to consumers in a reliable format⁵³. It is likely, however, that highly visual specialties such as dermatology, radiology and pathology are on the verge of radical change⁵⁴, and others may well be set to follow⁵⁵.

Regardless of these potential changes, the ability to accurately capture a representative clinical image will remain an essential skill (one that many doctors currently lack).

Documentation and uploading of video, haptic rendering of images and images captured hands-free will all require an increased awareness of the issues of patient privacy, consent to undergo a process which may be less accurate than face-to-face review, documentation and follow-up obligations. These fundamental steps need to be recognised and addressed at the early stages of smartphone consultations, to provide a solid foundation for future patients and doctors interacting with increasingly more complicated technology with an ever-expanding array of treatment options. A failure to address these issues presently may lead to increased risks of findings of liability against practitioners, and sub-optimal care being delivered to patients.

53 Lisa M. Abbott and Saxon D. Smith, 'Smartphone apps for skin cancer diagnosis: Implications for patients and practitioners' (2018) 59(3) *Australasian Journal of Dermatology* 168-170

54 Siddhartha Mukherjee, 'A.I. vs M.D.', *The New Yorker - Annals of Medicine* (New York), 2017
<<https://www.newyorker.com/magazine/2017/04/03/ai-versus-md>>

55 Cesar Molina et al, 'On-Call Communication in Orthopaedic Trauma: "A Picture Is Worth a Thousand Words"--A Survey of OTA Members' (2015) 29(5) *Journal of Orthopaedic Trauma* e194-7, Irene Tan et al, 'Real-time teleophthalmology versus face-to-face consultation: A systematic review' (2017) 23(7) *Journal of Telemedicine and Telecare* 629-638

Chapter 2: Current Practice

2.1 Introduction

An aim of this thesis is to investigate current practices surrounding informal mobile tele dermatology consultations, and their impact on dermatological practice. Previous surveys of medical practitioners regarding smartphone use for clinical photography have indicated that physicians who use smartphones to capture and send clinical images handle consent, documentation, and data security sub-optimally. The applicability of those surveys to Australian dermatologists is limited due to small sample size⁵⁶, distribution within a single institution⁵⁷, use within an alternate specialty which may not reflect the realities of dermatological practice⁵⁸, or location outside Australia⁵⁹ (where the legal implications, education system and technological and storage options vary). Accordingly, a survey was developed to investigate the prevalence, style and importance to practice of smartphone use in dermatology. The survey was issued to dermatologists practising in Australia, with ethics approval granted by the North Sydney Local Health District Human Research Ethics Committee (HREC/16/HAWKE/110).

Findings from the survey have been summarised in a brief article in the *Australasian Journal of Dermatology*⁶⁰. The survey data revealed that smartphone use to obtain and transmit clinical images was highly prevalent, particularly amongst junior and public hospital doctors in dermatology. Most junior practitioners considered the ability to take and send clinical images to be very important to their practice. The manner of obtaining and recording

⁵⁶ Lauren Kunde, Erin McMeniman and Malcolm Parker, 'Clinical photography in dermatology: Ethical and medico-legal considerations in the age of digital and smartphone technology' (2013) 54(3) *Australasian Journal of Dermatology* 192-197

⁵⁷ Kirk et al (n 4) and Kara Burns and Suzanne Belton, 'Clinicians and their cameras: policy, ethics and practice in an Australian tertiary hospital' (2013) 37(4) *Australian Health Review* 437

⁵⁸ D. McG. Taylor et al, 'A study of the personal use of digital photography within plastic surgery' (2008) 61(1) *Journal of Plastic, Reconstructive & Aesthetic Surgery* 37-40; Mehmet Astarcioglu et al, 'Time-to-reperfusion in STEMI undergoing interhospital transfer using smartphone and WhatsApp messenger' (2015) 33(10) *American Journal of Emergency Medicine* 1382-4

⁵⁹ Cynthia O. Anyanwu and Jules B. Lipoff, 'Smartphones, photography, and security in dermatology' (2015) 72(1) *Journal of the American Academy of Dermatology* 193-195; El Hadidy et al (n 4)

⁶⁰ Lisa Abbott et al, 'Smartphone use in dermatology for clinical photography and consultation: Current practice and the law' (2018) 59(2) *Australasian Journal of Dermatology* 101-107

consent, transmitting and storing images and documentation of advice provided was generally not sufficient to comply with professional and legal obligations.

To gain insight into why clinical images are so important to clinical practice, why doctors engage in questionable processes while sending and uploading images, and what support is required to improve these practices, a series of qualitative interviews of dermatologists and dermatology registrars from a variety of backgrounds was also conducted.

2.2 Methods

2.2 (a) Survey

The survey (Appendix 2) consisted of 24 questions and was designed to capture: frequency, reasons and methods for capture of smartphone clinical images, transmission and storage of clinical images, whether consent was obtained, the degree of reliance placed on information provided via smartphone referrals and awareness of current guidelines and workplace policy. Prior to administration, the survey was tested on a single dermatologist and a dermatology registrar to assess the length of time required to complete the survey (approximately 5 minutes), and whether the questions were comprehensible and unambiguous. All the dermatologists and dermatology registrars currently practising in Australia were then invited to participate in the survey via an email through the Australasian College of Dermatologists. The email contained a hyperlink to the survey, which was completed via an online platform (SurveyMonkey).

Analysis of the survey data was performed with the assistance of a statistician using statistical software (SAS). Categorical data was analysed using a χ^2 test and ordinal data was analysed using either the Kruskal Wallis or Mann-U-Whitney tests. Due to extensive multiple testing, p-values were adjusted using the Benjamini-Yekutieli method to reduce the likelihood of a falsely significant result and the adjusted p-values are reported in this thesis.

2.2(b) Qualitative interviews

Qualitative interviews were conducted with 6 dermatologists and 4 dermatology registrars on an individual basis between June 2018 – February 2019 in order to gain a deeper understanding of how and why doctors in dermatology send and receive clinical images, and to explore their views on the issues of privacy, consent, security, and barriers to introducing secure infrastructure. Ethics approval was granted by the North Sydney Local Health District Human Research Ethics Committee (HREC/16/HAWKE/110) to conduct semi-structured interviews (see questions in Appendix 3). Participants were recruited through an email by the Australasian College of Dermatologists. Interviews were variously conducted in person or over the phone, and recorded, transcribed and analysed by the author. Any potentially identifying information was removed from transcripts by the author.

The questions in Appendix 3 were asked of all participants. However, given the semi-structured nature of the interview, further themes emerged through the course of the interviews, such as the impact of the power differential between senders and recipients of clinical images, choice of communication techniques, the value of smartphone clinical image messaging within the supervisor/registrar relationship, and the emotional distress experienced and expressed by several participants as a result of using a non-secure (and in some cases prohibited) method to communicate information they considered critical for patient care. Several of these topics were then explored in greater detail with subsequent interviewees. Interviews were continued until saturation point was considered reached.

NVivo for Mac (Version 11.4.3) was used to collate data, although coding was performed manually by the author without the use of algorithms. An inductive approach was taken in analysing the data and where relevant, quotes have been attributed to participants (referred to with a numerical identifier, e.g. Consultant 1). Some recurring themes emerged from analysis utilising the codes, which are explored further below. Dermatologists interviewed were from Queensland, New South Wales and Victoria, and included a balance

of registrars, junior and senior consultants and male and female practitioners of a variety of age groups (see Table 2).

2.3 Results

The survey attracted 105 responses from dermatologists and dermatology registrars across Australia. As at 31 December 2016 there were 585 dermatologists and 114 registrars in Australia (699 in total, giving a response rate of approximately 15% of all those practising dermatology in Australia). One respondent was excluded on the basis that their practice was not based in Australia and three further respondents were excluded on the basis that they exited the survey after only completing the demographics questions. The remaining 101 respondents were included in the final analysis. Respondents were permitted to select more than one answer for several questions where appropriate.

2.3 (a) Demographics

The demographic data of survey respondents is shown below.

Table 1 - Demographics of survey respondents (101 in total)

	Level	N (%)
Nature of Practice	Private	45 (45%)
	Public	21 (21%)
	Both public and sector	35 (35%)
Location of Practice	Exclusively metropolitan	76 (75%)
	Exclusively regional	12 (12%)
	Exclusively rural	2 (2%)
	Combination of metropolitan, rural and/or regional	16 (16%)
Years of Practice	< 5 years	28 (28%)
	5 - 10 years	28 (28%)
	11 - 20 years	21 (21%)
	> 20 years	24 (24%)

The sample included a spectrum of experience, with a preponderance towards junior and early career dermatologists (55%). There were significantly more responses from dermatologists working exclusively in metropolitan areas, consistent with the geographic distribution of dermatologists in Australia, although 12% of respondents were based exclusively in regional areas and 16% practiced in a combination of metropolitan and rural and/or regional settings, allowing some comparison between exclusively metropolitan practitioners and those who had regional and rural patients. Demographics of interview respondents are provided in Table 2 below.

Table 2 - Demographics of interview respondents (10 in total)

Gender	Females	5
	Males	5
Years of practice	Registrars	4
	Consultant with < 10 years of experience, including dermatology training	2
	Consultant with >10 years of experience, including dermatology training	4
Location of practice	Queensland	2
	New South Wales	4
	Victoria	4

2.3 (b) Prevalence and frequency of clinical smartphone use

Over 97% of respondents reported carrying a smartphone with them at work.

A majority of practitioners sent and received photographs from their smartphone on a regular basis (Figure 2.1) with a significantly higher proportion of junior practitioners (89%) receiving photographs at least monthly (P value 0.001).

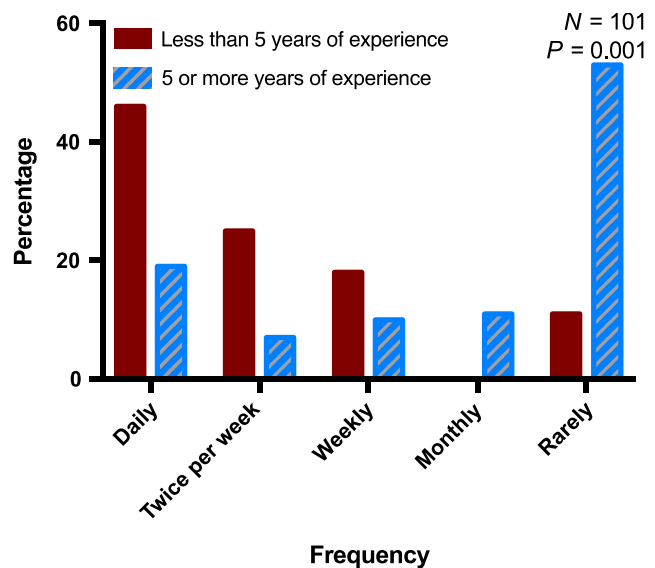


Figure 2-1: Frequency of receipt of clinical images

Whilst dermatology registrars clearly receive a disproportionately high number of smartphone clinical images, the extent to which registrars are bombarded with clinical messages was a surprising finding from the interviews. Registrars reported that their working hours were increasing as a result of being accessible to review smartphone images out of hours, reporting that “there’s no off time”.⁶¹ There was also a perceived increase in requests to provide advice on non-urgent conditions after-hours, due to the ease of accessing dermatological opinion via smartphone.

Consultants were particularly concerned about the workload of registrars once the amount of clinical smartphone messages were taken into account:

“Registrars are hammered every minute with photos. You’d probably get... seriously? I reckon some days, up to twenty.”⁶²

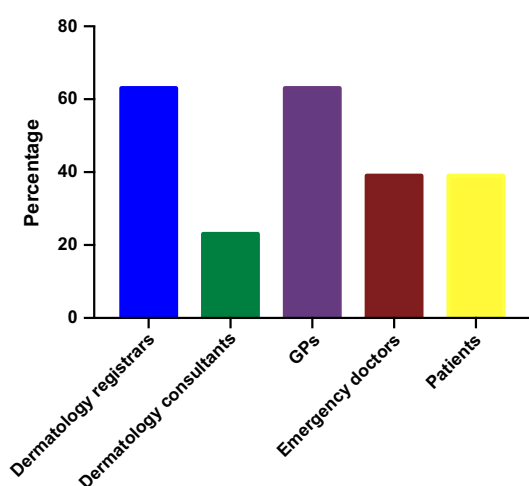
⁶¹ Interview 1, Dermatology Registrar

⁶² Interview 3, Consultant Dermatologist

"I hear from my registrars all the time... they're constantly being sent photos. Often it will be people who are on an ED term who already have the registrar's phone numbers and send through photos, so I feel like it's tough more on the registrars than on anyone else, they're being inundated with these photos from various sources."⁶³

This lack of "off-time" due to increased accessibility via smartphone is a pervasive issue in several other industries, and can lead to burnout⁶⁴.

2.3 (c) Sources of clinical images



Dermatologists frequently receive images from general practitioners, other dermatologists and directly from patients (Figure 2-2). Those working in the public sector more frequently receive images from emergency doctors and dermatology registrars than those practising in the private sector only (p values: 0.001, 0.001 respectively).

Figure 2-2: Percentage of respondents who report receiving images from the following sources

More experienced dermatologists appear to be more comfortable receiving images directly from patients, perhaps in part due to familiarity with long-term patients, confidence in diagnostic skills and because dermatologists in private practice have greater capacity to limit the methods by which they are contacted and the circumstances in which they interact with patients.

⁶³ Interview 5, Consultant Dermatologist

⁶⁴ Arnold Bakker and Daantje Derks, 'Smartphone Use, Work–Home Interference, and Burnout: A Diary Study on the Role of Recovery' (2014) 63(3) *Applied Psychology* 411-440

2.3 (d) Purpose of clinical smartphone use

When dermatologists capture images of patients using their smartphones, it is generally for one or more of the following purposes: obtaining advice from a colleague (60%), monitoring patient progress (55%), communicating with other doctors caring for the patient (34%), for the purpose of education (38%), research (12%) or as a back-up when their dedicated camera fails (8%).

Images are most commonly received with a request for advice on diagnosis (90%) and treatment (85%). Other purposes include advising on an appropriate time frame for follow-up (32%), which was far more prominent amongst registrars ($P = 0.009$), education (17%) and, less commonly, to monitor rural patients who are unable to attend for follow up in person (5%).

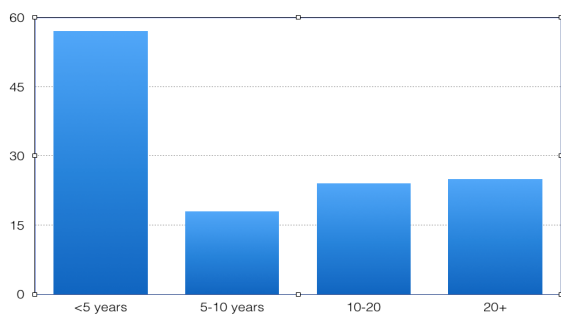


Figure 2-3: Percentage of practitioners who use smartphone consultations to determine appropriate follow-up time frame

Junior doctors were more likely to use their smartphones for the purposes of triage. Interview respondents reported that images allowed them to plan whether to bring biopsy kits with them to the wards⁶⁵ and to determine the order and urgency of inpatient consultations:

“When you’re in a busy clinic, and there was a child, and they didn’t know what was going on, I would say – look, send me through some photos, and then I’ll have a quick squiz and give you a buzz back once I’ve had a look. And that would often be the decider as to whether I would go and review the patient then, or whether I’d wait.”⁶⁶

⁶⁵ Interview 2, Consultant Dermatologist

⁶⁶ Interview 5, Consultant Dermatologist

Unsurprisingly, junior doctors are also significantly more likely to use smartphone clinical image transmission to request the opinion of a senior colleague or supervisor. The degree of responsibility placed upon junior registrars in Australia is relatively high. Prior to the introduction of smartphones, often the registrar's verbal description regarding the patient's presentation may be all the information that a consultant would have upon which to make a decision about whether to admit a patient. There are no formal requirements for prior experience when rostering registrars to provide on-call care, so it is entirely possible to have a first-year registrar with extremely limited experience (in any specialty) being in a position of significant responsibility.

All registrars interviewed, despite having a range of experience, reported a degree of angst regarding missing diagnoses or failing to communicate important information, and reported this was relieved in part through the ability to send clinical images to their supervisors. Registrars valued being able to quickly and efficiently provide images alongside a verbal description:

*"Hopefully our ability to describe dermatoses is better, but I think a photo speaks a thousand words, to convey severity and extent and all these other features that my description can't. So [without a photo] **I would be scared that I wasn't conveying the whole picture to the bosses, and therefore I think their advice would be limited by that.**"⁶⁷*

"I guess [my supervisor] might see things in an image that I've missed. He might interpret, you know, a differential that I haven't thought about that was more acute."⁶⁸

*"Sometimes you **genuinely have no idea**, especially when you're junior."⁶⁹*

"I guess, I used [my smartphone] as a registrar, mostly to get advice from other people, and..."

⁶⁷ Interview 9, Dermatology Registrar

⁶⁸ Interview 6, Dermatology Registrar

⁶⁹ Interview 1, Dermatology Registrar

Q: Did you find that helpful?

A: Oh, God yeah. Absolutely. If you send someone a photo and you say, do you think this is TEN⁷⁰ or do you think it's just a drug eruption? **When you're a junior registrar, it's invaluable to be able to send images to your consultant. Yeah, enormously helpful.** Definitely it has downsides and it could be done better, but yeah, huge help to the patient, and the person who's asking for advice."⁷¹

Consultants valued the ability to review clinical images from their registrars, noting increased confidence in their ability to diagnose and manage patients from a distance, and to assess the progress of their registrars:

*[Regarding approaches to supervising dermatology registrars]: "One is that I simply trust him, which is one way. The second is that he gives me a phone call and tells me something, which I can't see. Or the third is that he sends me images. And I think it is up to you, which is the best. Even if the images are blurry, it's better than if someone tells me a story, which I anyhow don't believe. **It's very clear that... it is, among the 3 options, still the best.**"⁷²*

*"I think it's a fantastic tool. If I'm actually on call and I **have an able, capable, cluey registrar, I'm very comfortable** with them sending images to me with adequate clinical information and **I can actually give them good advice and they can act on it, quite accurately...** look, it definitely helps. Having the ability to send smartphone images **helps the clinical situation, particularly the on-call situation.**"⁷³*

The survey data indicates that the practice of seeking advice from seniors continues beyond the training years, albeit decreases in frequency as clinicians become more experienced. Interview respondents reported that the ability to contact senior consultants was particularly helpful as practitioners can become isolated once working in private practice:

"If I've got patients that are a little bit challenging or they're a little bit anxious about something - I'm a junior dermatologist, so I've had [cases] I run by my seniors to make sure, or if I want to start an experimental therapy, particularly in a child, you

⁷⁰ TEN is Toxic Epidermal Necrolysis, a life-threatening dermatological emergency

⁷¹ Interview 7, Consultant Dermatologist

⁷² Interview 4, Consultant Dermatologist

⁷³ Interview 9, Consultant Dermatologist

*just want to run it by someone to make sure if it sounds like its ok. You're kind of on your own in private-land."*⁷⁴

Some respondents used smartphone clinical images to provide advice to doctors managing rural patients, which has obvious value for geographically remote patients and general practitioners. In Queensland this process is formalised and closely supervised, allowing for teaching opportunities and close assessment of the performance of registrars:

*"We have an official telederm service that's 24/7 where every case is checked by a consultant, and that is an enormously useful educational service for the registrars. They basically treat every case like a short case exam viva, and they have a consultant give them feedback on every single one. They're usually really interesting inflammatory dermatoses. So... they find that really useful. They give a provisional plan, and it gets okay-ed or changed by the consultant. It's great educationally for them."*⁷⁵

2.3 (e) Importance to practice

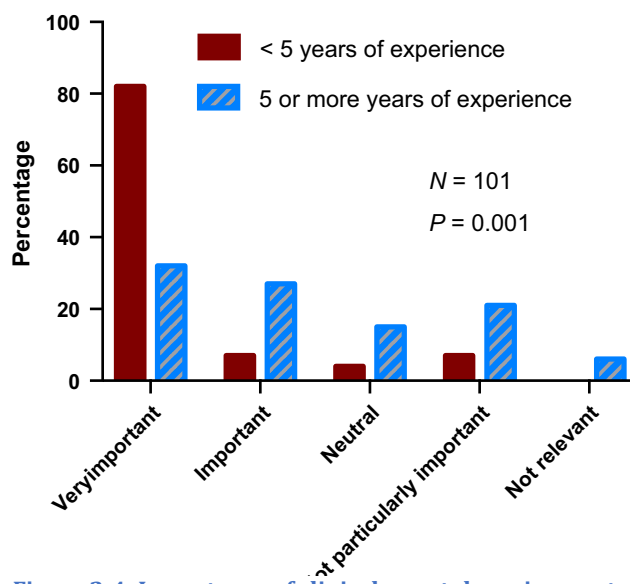


Figure 2-4: Importance of clinical smartphone images to practice

A majority of practitioners across all levels of experience and sectors reported that the ability to send and receive clinical photographs was important in managing their patients effectively.

This was especially so amongst junior registrars, 82% of whom rated this ability as very important (Figure 3, *p* value 0.001). This may be because

⁷⁴ Interview 3, Consultant Dermatologist

⁷⁵ Due to the small number of interviewees, the numerical identifier will not be disclosed here.

registrars are those most often dealing directly with non-dermatologically trained doctors. This is a particularly important factor, because dermatology teaching is relatively limited in medical schools across Australia, with some medical schools providing 6 hours or less of dermatological education over 4-6 years of university.⁷⁶ Consequently many junior doctors, or doctors who trained in non-dermatological specialties, often lack sufficient terminology to adequately describe what they see (the morphology), or lack the clinical knowledge to know where, or how, to look for further visual clues and capture these in a clinical photograph. As a result the value of clinical photographs takes on a greater importance.

Several registrars reported a lack of trust in verbal communications from emergency doctors:

“Without the ability to review the clinical images, I would not be confident in being able to recommend any interim management or investigations, because... the descriptions of non-dermatology trained physicians or surgeons, what they were describing to me was completely different to what was then in the photos. And that’s not a criticism of them, it’s just... everything was ‘maculopapular’, because that’s the most common term that we get taught in med school, but the subtle variation we look for - vesicle, blister, pustule, distributions are not conveyed in their descriptions.”⁷⁷

“In the interest of being safe, a photograph, even though it may not be 100% representative is far superior to their poor description. And often once you get the photograph you realise, oh my goodness, it’s completely different to what they said.”⁷⁸

“To be honest, if we get an after-hours consult, 100% of the time we’ll ask for photos... For example, I’m on call tonight and I got a call, and I was told this patient had a non-blanching rash on the ankle, with a ‘blanching petechial rash covering the rest of the body’⁷⁹, which you often need a photo to clarify, is it petechial or is it blanching? So you can’t rely on clinical history alone. You’re reliant on the photos to

⁷⁶Anita Gupta et al, n42

⁷⁷ Interview 8, Dermatology Registrar

⁷⁸ Interview 1, Dermatology Registrar

⁷⁹ Petechiae do not blanch.

say 'no we can see this tomorrow, I'll see it next week or I need to come in and see it now'. ”⁸⁰

“Someone will say that there's no blisters, but there'll be large erosions indicating that there were blisters. I find it hard to go off clinical descriptions rather than photos.”⁸¹

It is important to consider the role of clinical images in these interactions. Do they *supplement* a verbal request for a consultation which otherwise would have been exclusively assessed upon verbal descriptions of clinical findings, or do they *replace* physical attendance of a patient during on-call hours? The question as to the content of the duty of care when advice is provided via smartphone is addressed in [Chapter 3.3\(b\)](#). From the survey data and qualitative interviews, both scenarios are common, with 45% of all dermatologists using clinical photography in place of physically reviewing a patient at least once a month or more often, more so amongst those who work in the public sector (P value = 0.02).

Dermatology registrars are not regularly required to urgently attend to patients overnight, as *“it's rare that we get patients that are really that sick I suppose... it's not often that you have to distinguish between what's life threatening and what's not life-threatening.”⁸²* As a result, prior to the introduction of smartphone clinical images alongside a call from Emergency, decisions would regularly be made on the basis of verbal descriptions alone:

“Q: What would have happened before smartphones? Would you have to come in to see a patient every time or would you have to trust [the Emergency doctor] and say, on the basis of what you've told me-

A: I just think there'd be a lot of misdiagnosis.”⁸³

⁸⁰ Interview 6, Dermatology Registrar

⁸¹ Interview 3, Consultant Dermatologist

⁸² Interview 5, Consultant Dermatologist

⁸³ Interview 3, Consultant Dermatologist

Some registrars reported that their rate of attendance actually increased for cases where images revealed a dermatological process requiring urgent review, whilst reducing out-of-hours attendances for non-urgent matters:

“There were a few times where I didn’t have to come in over the weekend because I was able to assess the image, take the history, and deem it to be a non-urgent thing that could be reviewed Monday, or there could be some interim management or investigation advice given and then we could review them early in clinic... Conversely there was a couple of times where the clinical description I got from the referral over the weekend probably underplayed the severity of the process and... I then looked at the images and said, oh I should come in to review the patient, because I think something more sinister is going on.”⁸⁴

Where clinical images provide an impetus for earlier review, patient safety is obviously improved. In the scenario where non-urgent matters are delayed until the next working day, it is always possible that failure to review in person may result in a delayed diagnosis and worse outcomes for patients. Accordingly, care must be taken when determining whether a consultation may be delayed, although doing so on the basis of clinical images would generally be more satisfactory than relying on verbal description alone. It is particularly important that reassurance from the appearance of the clinical image is not permitted to override the concerns of the referring doctor, particularly if other red flags exist, as photographs can on occasion be misleading, giving rise to a risk of misdiagnosis (this issue is discussed in greater detail at 3.5 (a) Breach of duty).. If misdiagnosis arises as a result of a smartphone consultation, a defence may arguably be available under s50 of the *Civil Liability Act 2002 (NSW)*, given the sheer prevalence of smartphone use for clinical review, and the value attributed to it by practitioners (see further discussion at 3.5(b)).

⁸⁴ Interview 8, Dermatology Registrar

2.3 (f) Adequacy of clinical images

The quality of clinical photographs received by interview respondents was generally reported to be excellent, although this was operator-dependent:

“The images in 95-98% are good enough. Of course it’s better if I can see it, feel it, turn around the patient, it’s all clear. But the reality is this is simply not possible in this system, and I have a very strong feeling that images work relatively well.”⁸⁵

“The images are, if you shoot through a dermatoscope, it’s like, oh my god, it’s almost as good as a digital SLR. And they’re beautifully configured for macro, iPhones.”⁸⁶

“The photos are very... certainly, they enhance your information dramatically... Generally they’re pretty good. Often they take photos that are too close-up. It’s easy to take a distant, sort of localisation photo, and a close up. I think that’s the main thing. I think most times the quality is actually pretty good these days.”⁸⁷

Despite the relatively high quality achievable with smartphone clinical images, several respondents expressed significant concern regarding aspects of physical examination in dermatology that cannot be depicted in the photographs. Alternatively the photographer may lack the clinical knowledge and skills to know where to look and how to capture relevant clinical findings (for example, to look inside the mouth or genitals for ulcerations or plaques, or to look between the fingers and toes for burrows). In this regard, the lack of dermatological training of medical students arises again in the limited ability of medical graduates to provide a comprehensively informative set of clinical images.

“It’s hard, there’s a lot of things you can’t tell from the photo, like how well is the patient, what’s the texture of the skin. And it’s all well and good to trust someone else’s history taking, but it’s often when you see the patient yourself you delineate important facts that haven’t necessarily been discussed before. I’m kind of conflicted about it, because I do think there’s a place for it, I do think there’s a role for it, but I

⁸⁵ Interview 4, Consultant Dermatologist

⁸⁶ Interview 9, Consultant Dermatologist

⁸⁷ Interview 2, Consultant Dermatologist

don't think it replaces being clinically reviewed... It's hard because dermatology is a very visual specialty, but there's a lot of things you can't gauge from a photo."

*"There's a lot of times that it's hard to tell the difference from hand foot and mouth and eczema herpeticum, unless you're actually seeing the patient, you can see the texture and the punched-out erosions. There's so many things you can't gauge from a photo that are going to guide your management."*⁸⁸

*"Sure it's useful sometimes but I think as visual as dermatology is, you also need to be able to feel the skin, feel the induration, feel the scale, do a proper examination yourself, you know, lift up the leg, look if something's circumferential, examine the genitals."*⁸⁹

*"Sometimes I'll come into ED and there's a really faint rash, and the boss just can't see it on the photo, it's too faint. Sometimes I take a video and that's better. Other times I have to apologise and just tell them it's not projecting, and these are my concerns. Sometimes they realise within themselves, that your face to face is better than their photo. I think it's your responsibility as the clinician to redirect that person's focus on the image onto what you've seen."*⁹⁰

Photographs were also identified to be potentially misleading on occasion:

*"The reason I hate it is there's so many variables. How you take the photo, the lighting, the focus, the... you know, it has the flash on, and you're only seeing... one image of one point in time, things change, it's dynamic. I don't think it ever negates a face to face consultation... except for dire emergencies."*⁹¹

2.3 (g) Provision of clinical context alongside smartphone images

Survey respondents who received clinical images reported wide variations in the surrounding clinical context provided with images (Figure 5). Where insufficient information was provided, most dermatologists preferred to call the sender to communicate directly

⁸⁸ Interview 5, Consultant Dermatologist

⁸⁹ Interview 6, Dermatology Registrar

⁹⁰ Interview 1, Dermatology Registrar

⁹¹ Interview 1, Dermatology Registrar

(64%). Text messages were also often used (49%), or some dermatologists provided an opinion with a caveat due to the insufficient information (24%), or did not respond to the request (6%). Several interview respondents expanded on this topic, reporting a trend amongst referring doctors to rely more heavily on images and provide *less* verbal or written information regarding examination findings and history (rather than using the images as a supplement to ordinary communications):

“Basically people want to send a photo to you, and in their mind it negates taking a history or an exam, and I have to invite them to do their job, which is actually taking a history of their condition, and doing an exam, and doing bloods, and then they should try to make a reasonable stab at describing a condition, and I don’t care if they can’t use the proper terms- like, red and bumpy, great - that tells me it’s a papule or plaque.”⁹²

“If you don’t have enough information, then you really can’t give 100% accurate advice. So, where they say, is this shingles? You know what? I only have photos of one side, so I don’t know if it’s on the other side or not. Or, often it’s inadequate information. The rash is just a very non-specific reddish thing, and you can’t feel it, you don’t know if the patient has a fever, you can’t really see the patient, so there’s lots of missing information if people just send an image, and most people think that’s all you need.”⁹³

Strategies identified to address these issues include requesting more specific or numerous photographs, calling to ask specific questions about examination findings or coming in to review the patient.

“I would often then ask them for specific photos if I thought it was a particular condition, so in my differential from what I’ve seen I would direct them to take more clinical photos of the areas of interest.”⁹⁴

⁹² Interview 2, Consultant Dermatologist

⁹³ Interview 9, Consultant Dermatologist

⁹⁴ Interview 3, Dermatology Registrar

2.3 (h) Consent

Consent for storing and transmitting clinical photographs via smartphone was usually obtained when taking clinical photographs, but not often documented – only 2% obtained written consent from the patient, 28% obtained verbal consent and documented this in the clinical record, while 45% obtained verbal consent without documenting it anywhere. Thirteen per cent of respondents stored or transmitted clinical photographs without obtaining the patient's consent.

Amongst interview respondents, verbal consent was usually sought but variably recorded. Most respondents also recognised that the verbal consent provided by patients was often not *informed* consent (in the sense of the doctor explaining what would happen to the image), as they were perhaps aware that the image would be sent to a consultant, however they often did not inform the patient of other ways in which images would be used or stored.

“People don't tend to explain, ‘this is going to be a medical document, I'm taking this on a personal device, and I'm sending it to someone who you don't know, and it could be their personal device and we have no control over where that image is going to go later. Yes, I've actually included your armband with your MRN, full name, date of birth and address on that photo, that will then go to all these phones, they might then send it on to someone else because it's interesting.’”⁹⁵

“The reality is that every registrar, and probably many, many consultants have images on their phone from patients... I don't take photos from patients, but this is because I'm senior, and I tell the registrars to do it.”⁹⁶

“I think often patients aren't providing informed consent, they're probably providing implicit consent, because the photos are taken of them, but they're actually not aware of what's happening. So I think that's probably the thing that concerns me the most. Even hospitals don't have consent forms. I mean often private practices will, because, you know, when they provide medical details, and their next of kin, it'll be

⁹⁵ Interview 6, Dermatology Registrar

⁹⁶ Interview 4, Consultant Dermatologist

*'are you happy for clinical photos to be taken', 'are you happy for these to be provided in posters and conferences,' but we don't give patients that choice to opt out formally. So I think that's often what concerns me the most.'*⁹⁷

Of those who provided medical advice in relation to images received on the smartphone, 23% did not record that advice anywhere.

Approximately 16% relied upon the referring doctor to record advice and others relied upon records of communication on their smartphone (42%). Only 52% of practitioners ensured that the advice they gave was separately recorded in the patient's medical record at their workplace.

This is concerning, because several interview respondents raised the issue of inaccurately documented advice by referring

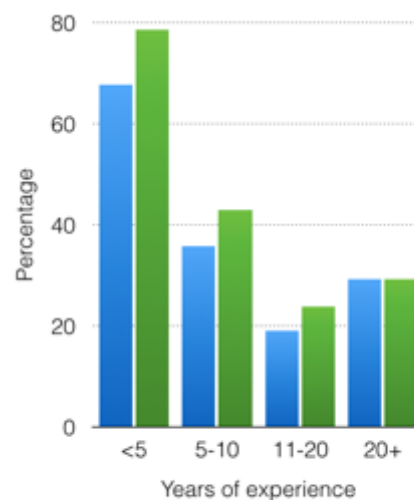


Figure 2-5: Percentage of respondents who store images and advice on smartphone

doctors. Most respondents wanted to be able to make notes in the EMR themselves, however lacked the software to do so whilst away from hospital premises. Nonetheless, only one interview respondent reported keeping a written record of advice provided regarding on-call patients. Given the frequency of inaccurate records, dermatologists and registrars may be placed in a compromising legal position if advice is provided regarding a smartphone consultation and they lack accurate evidence of the advice provided.

*"I find that often the verbal advice, it doesn't matter how clear you are, it's often miscommunicated. I would actually then take to writing out my plan in a text and asking them to write that into the notes, but I would say that more often than not, it is still not correctly translated."*⁹⁸

⁹⁷ Interview 6, Dermatology Registrar

⁹⁸ Interview 1, Dermatology Registrar

“Initially I was documenting every advice that I gave because I just found that there were discrepancies between what the person documented what I said versus what I actually said... But there was a point where I was like... I can’t, I’d be here all night.”⁹⁹

“At the moment we don’t have remote access to the electronic medical record, so I keep a book of what I’ve said to people, so that if I one day, hopefully I don’t get sued, I can say this is what I wrote down. But there’s been a few cases recently where I’ve been misquoted, and then I’d go in the next day and actually write in retrospectively I did not have access to the medical record, this was the advice, and go from there. But it’s a huge issue. What I’d do is give the instruction, and ask the person to read it back to me, and ask the person [to] type it as I’m saying it. I tell them I don’t want to look like a total control freak, it’s just that I’ve been misquoted so many times.”¹⁰⁰

Consultants were generally comfortable to allow registrars to document advice that they provided:

“I don’t personally document with the registrars, generally when I’m giving a registrar advice. They’ll say, ‘photos reviewed, and case discussed with Dr [name]’ and that’s generally recorded in the patient’s medical record.”¹⁰¹

The failure to do so leaves doctors legally exposed if the quality of the advice given, or if what was sent becomes an issue in professional disciplinary or medical negligence proceedings (see further discussion at s3.4 (a) Duty of care).

2.3 (i) Storage and deletion of clinical images

Only 51% of survey respondents transferred clinical images they received to the patient’s electronic or physical file in their workplace. Other locations for storage of clinical

⁹⁹ Interview 8, Dermatology Registrar

¹⁰⁰ Interview 1, Dermatology Registrar

¹⁰¹ Interview 5, Consultant Dermatologist

photographs included the practitioner's smartphone (46%), a personal computer (27%) and less commonly email (4%), a cloud-based server (4%) or tablet (4%). Three respondents commented that they delete photographs from their phone as soon as the consult was complete. Those who regularly sent images were significantly more likely to store those images on their mobile phones.

Although clinical images were universally accepted as an important part of the medical record by interview respondents, several reported deleting these images without ensuring they were uploaded into the medical record:

"It's like capturing an ECG or taking an X-ray, it's almost identical. I treat patient images with great respect. Like, this is what these images mean. They are part of a record. Super important. Crucial... An image not uploaded is pretty useless as a medical record."¹⁰²

"What I am careful to do is if someone does give me a message with a photo I delete them both as soon as I've seen them. Delete it from my message, delete it from my phone, delete it from my trash, because I don't want that on my phone."

"What I tell the registrars is, once you send it, and you delete it, try to delete it off your phone, it's done its job, delete it. And uh, you know we try to do that. So having said that, I have to admit, I don't necessarily delete the sequence of chat messages, the stream. So it's still living there [on my phone]."

Delayed upload was acknowledged to be a potential source of error, as those who don't attach a clinical photograph to a patient file run a significant risk of mistakenly attributing that image to another patient and risking misdiagnosis, or losing the use of that documentation altogether:

"I actually know some practitioners who take clinical images, don't upload them to the file, have them sitting in the hard drive, and will say, oh this patient came [on this

¹⁰² Interview 9, Consultant Dermatologist

date], go back to that date, scroll through, there'll be a few hundred images to go through to find it... there's so much capacity for things to go wrong.”¹⁰³

Those who stored images on their smart devices in message streams regarding a specific patient seemed somewhat uncomfortable with their approach:

“You know, [the clinical images are] in my message feeds (laughs nervously). Mmm... not that good is it?” Consultant

“Truth be told, there wasn't any formal way of storing those images, and they weren't encrypted... I've got a thing that password protects the images, but um... they're still on my phone.” Consultant

“I kind of stress that ‘this is only going to a treating physician to help manage your condition, I will delete it straight after, that kind of stuff’. Whether I delete 100% of the photos, I don't think happens, not intentionally, but... yeah.” Registrar

“So when you do say, yeah, send me a photo, this is my personal device because I don't have the work phone available, you know that you're not going to upload it to their file, so that is a medical document which you're then going to delete and destroy but you're still going to base your clinical decision on that image, that's now not available. So, if something were to happen, and someone were to complain, or it was to go to court, I wouldn't have a leg to stand on, that image is now gone and there's probably been no written consent.” Registrar

Those who routinely uploaded clinical images into the medical record had been provided with software to do so by their workplace, or had private practice software that enabled transfer from their digital cameras:

“We've actually got an on-call phone... that's just for the department, that's passcode protected. [Clinical images] are uploaded to the file because [the

¹⁰³ Interview 9, Consultant Dermatologist

consultant] is very aware of [legal implications], and I think he's actually already involved with doing stuff with [hospital's] IT people to try to make it all formal.¹⁰⁴

2.3 (j) Transmission of clinical images

Clinical photographs are commonly sent by email (85%) and text (70%). A small proportion utilised a purpose-built application for clinical photography (7%), Skype or videoconferencing software (8%) or another messaging application (7%). It is interesting that only 7% reported an alternate messaging service, given the established worldwide predominance of Whatsapp in the hospital setting, although it is entirely possible that the choice of app for messaging is culturally influenced by the specialty and location. Another possibility is that respondents who selected “text message” (as a format they used to send images) included WhatsApp interactions under this category due to its extensive similarities with standard SMS.

Interview data suggested that there is a power imbalance in the choice of transmission method. That is, where a consultant dermatologist has a preferred means for transferring images to the patient record, registrars tended to adhere to this wherever possible. Likewise, where registrars have a preferred method, referring doctors requesting advice will usually send images via that method. That is, the person providing the dermatological advice dictates the standard platform utilised during image interactions.

Consultant: “Sometimes [registrars] also send [clinical images] by message, but this is actually quite rare, because they know that I prefer to have it via email.”¹⁰⁵

Registrar: “I have had the odd occasion where people that I’ve dealt with consults before have re-messaged me, and I just tell them that’s inappropriate, you need to call me.”

¹⁰⁴ Interview 6, Dermatology Registrar

¹⁰⁵ Interview 4, Consultant Dermatologist

Registrar: "I'm really strict, so in our hospital it can't come to my mobile, it's got to come through our work email, which I have access to on my phone, my phone has a secure code, if I lose it, [the phone] will wipe itself."

Two respondents worked in a setting where a means of uploading images to the clinical file were clearly outlined by the employer. Where convenient means to upload images were provided, the registrars adhered to these.

"The hospital made such a... point of obviously images and privacy, you know, the policy was that we really weren't able to send images in any other way. So if it's in hospital referrals, we would just access the EMR, the medical record, and the doctors would kind of take photos through the EMR. So, we didn't have to transfer the images that way."¹⁰⁶

Difficulties arise when communicating photographs to parties who do not have easy access to the electronic medical record, either due to lack of appropriate recipient mobile software to review records, or due to generational differences:

"I would take the photograph that would get stored securely in the medical record. But because the bosses sometimes couldn't access the medical record remotely, I'd have to screenshot them, and then send that photo through via a text message. So... although the system was trying to do the right thing in terms of um, making sure that we didn't have any images on our phone, it would automatically go into their files encrypted, and stored securely on the hospital server on the patient's medical record, it would be ideal if the bosses could then remotely access that medical record."¹⁰⁷

It is apparent that there is a role for institutions and supervisors to play in providing appropriate platforms to influence the standard mode of transmission and upload, and that registrars also have some agency in selecting how junior and other referring doctors communicate with them.

¹⁰⁶ Interview 9, Consultant Dermatologist

¹⁰⁷ Interview 8, Dermatology Registrar

2.3 (k) Security measures

Many respondents had taken one or more security measures to protect data security on their phones, including using a passcode (77%), auto-locking function (79%), remote deletion of data in case their phones were lost (19%), and encryption (5%). These measures were more common amongst junior practitioners, who are likely to be more technologically savvy.

2.3 (l) Policy & Education

Only 22% of respondents reported awareness of clear guidelines in their workplace on the use of smartphones for clinical photography. Approximately 34% of respondents were aware of a formal procedure in their workplace for adding photographs from their smartphone to a patient's record. Less than half of respondents had read the Australian Medical Association's guidelines on clinical images and the use of personal mobile devices. Most respondents reported they would appreciate further education on taking, transmitting and storing clinical photographs on smartphones (65%).

2.3 (m) Concerns regarding legal risks

Clinical images were considered to be helpful from a medicolegal perspective by some interviewees to establish that *"if things change for the worse, then you can say at that point in time, this is exactly what it looked like,"*¹⁰⁸ although there was also concern over the potential that someone may *"crucify your decision based on the photograph that was there."* This was supported by another respondent who noted that *"there's actually kind of a school of thought, that photographing things may backfire on you, and hence, don't photograph."*¹⁰⁹ Despite these concerns, there was one respondent who reported a

¹⁰⁸ Interview 1, Dermatology Registrar

¹⁰⁹ Interview 9, Consultant Dermatologist

situation where a patient subsequently deteriorated where the clinical photograph was of evidentiary importance:

“I think the photograph saved me, because I was like, well no, this is what I based my assessment on, he looked very well, this is limited, these were all his obs, that’s why I didn’t think he needed admission, so that kind of saved me.”¹¹⁰

Non-secure methods of capture and transmission, and failing to upload photographs can cause discomfort and distress to practitioners, particularly junior ones. Several respondents directly expressed their discomfort, while others appeared uncomfortable more indirectly when asked direct questions on privacy and consent (e.g. notable extended pauses, nervous laughter, trailing off or providing rambling, indirect answers).

“For me, medico-legally, I’m aware that whenever I send an image or whenever I request an image that I’m doing something wrong. And I don’t like to break the rules! I like to do the right thing!” Registrar

“I don’t feel comfortable about that at all, and I sort of worry that I will be in trouble at some point. I genuinely worry about a patient complaint or my public health provider, me getting in trouble from them if they went through all my personal email or mobile phone messages... I don’t feel comfortable about it, but I don’t have an alternative user-friendly way of doing it, I can’t log on to patient charts from home.” Consultant

The issue of patient privacy is discussed further at Chapter 4.1 Introduction.

¹¹⁰ Interview 1, Dermatology Registrar

2.4 Discussion

2.4 (a) Smartphone use by dermatologists worldwide

The findings from my sample of 101 Australian dermatologists are consistent with a number of other studies assessing aspects of clinical smartphone usage, both in dermatology and other specialties, in Australia and beyond. Kunde et al¹¹¹ surveyed dermatology registrars in Australia in 2013 with a 65% response rate (n=13), and found that 85% stored over 100 patient images on their personal smartphones. Smartphone clinical images were mainly used for treatment and monitoring, and to obtain advice from their peers or consultants, with 92% reporting texting or emailing images for advice. Only 23% had security features enabled on their device, and 15% routinely recorded that verbal consent had been obtained for photography.

Three studies in the United States suggest similar practices amongst dermatologists. Anyawanu et al¹¹² report findings from a 2014 survey of 90 dermatologists in Philadelphia (response rate 28%), in which residents were more likely to use smartphones for storage of clinical images (44% of residents compared with 21% of all respondents) and to report that the ability to send and receive clinical images instantaneously was important to their practice (88% of residents as compared with 55% of all respondents). Sending and receiving patient images by text and email was common, with 94% of residents and 74% of all respondents reporting receiving images via text messaging from colleagues, and 75% of residents and 48% of all respondents reporting sending clinical images to colleagues via text message.

Milam et al¹¹³ surveyed board-certified dermatologists (consultants) across the United States in 2015 as to their clinical photography practices. Almost half (46%) reported using

¹¹¹ Kunde, McMeniman and Parker (n 56)

¹¹² Anyawanu and Lipoff (n59)

¹¹³ E. C. Milam and Marie C. Leger, 'Use of medical photography among dermatologists: a nationwide online survey study' (2018) 32(10) *Journal of the European Academy of Dermatology and Venereology* 1804-1809

their smartphone cameras to capture clinical images, and 42% of those used secure applications that sync with the electronic medical record. Almost a third (30%) reported storing images on their personal smartphone, and 30% also reported storing clinical images in the patient's electronic or hard copy file, with other locations including personal devices or cloud storage. Despite this being a survey of consultants, a surprisingly high percentage (64%) reported they emailed or texted clinical photographs to ask for clinical opinions from colleagues. A survey of Mohs surgeons (a category of dermatologists who have sub-specialised) in the United States of America regarding their use of clinical photography revealed 35% of respondents used clinical photographs to request informal or "curbside" consultations, and 40% of respondents reported having used a smartphone in the 3 months prior to the survey for clinical images.

Similar rates of smartphone utilisation have been reported in the United Kingdom. A 2016 survey of British dermatologists regarding attitudes towards teledermatology reported that almost half of all respondents (47%) used smartphones to take clinical images. The majority (93%) obtained some kind of verbal consent, with 32% obtaining more formal written consent.

2.4 (b) Smartphone use by other medical specialties

Smartphone use for clinical images is common amongst other medical and surgical specialties. Of these, plastic surgery is the field in which smartphone clinical photography is most reported. A French study reported up to 91%¹¹⁴ of plastic surgeons use smartphones to capture clinical images, with photographs commonly stored on smartphones (up to 50% of respondents), although 80% reported they *would* use a dedicated smartphone application if available. Another survey of plastic surgeons in the United States¹¹⁵ (151 consultants and 153 trainees) reported 91% of respondents used smartphones to capture

¹¹⁴ Kroemer et al (n30)

¹¹⁵ Benjamin Simpson Jonathan Lam, Frank Lau, 'HIPAA Non-Compliance in Digital Photograph Management and Security in Plastic Surgery' [43] (2017) 5 (9 supp) *Plastic and Reconstructive Surgery Global Open*.

clinical images, with respondents self-reporting high rates of HIPAA¹¹⁶ violations at nearly every phase of the patient photograph workflow. Similar results were reported in Canada, where a 2014 survey of 103 plastic surgeons and 44 residents by Chan et al¹¹⁷ indicated 89% used smartphones for clinical photos, and 57% stored these images on their personal phones. Almost three quarters (73%) of those who stored images on their smartphone reported these images were stored amongst their personal photographs, and 26% per cent had accidentally shown a clinical photograph on their phone to friends or family.

A cross-specialty study performed within one Australian hospital¹¹⁸ showed that 64% of respondent doctors had taken clinical images on their smartphones, 25% of those did not obtain consent for capturing, storing and transmitting clinical images and only 7% recorded that consent was obtained in the clinical file. Only 63% retained clinical images, and 85% of those respondents had images stored on their smartphone. Awareness of hospital policy regarding smartphone clinical photography was low, with 43% reporting awareness of such a policy yet only 28% reported having read the policy. Notably, most respondents (90%) considered smartphone clinical photography to have a positive effect on patient care. A similar cross-specialty study at 2 hospitals in Dublin showed that 97% of respondents used smartphones for inter-team communication, with 74% using Whatsapp. Smartphones were used for 57% of clinical images, and 41% of radiological images, and 92% agreed, or strongly agreed, that smartphones positively influenced their practice¹¹⁹.

These studies illustrate that smartphone use for clinical photography and communication between doctors is common, perhaps routine, and highly valued, amongst a number of medical and surgical specialties in locations across the developed (and the developing¹²⁰) world. Given the value placed on the ability to quickly and efficiently capture images and

¹¹⁶ Health Insurance Portability and Accountability Act of 1996 (HIPAA), Public Law 104-191, 45 CFR Subpart E - Privacy of Individually Identifiable Health Information (' Health Insurance Portability and Accountability Act of 1996 (HIPAA), Public Law 104-191

45 CFR Subpart E - Privacy of Individually Identifiable Health Information').

¹¹⁷ Natalie Chan et al, 'Should 'smart phones' be used for patient photography?' (2016) 24(1) *Plast Surgery (Oakville, Ontario)* 32-4

¹¹⁸ Kirk et al (n 4)

¹¹⁹ Nesbitt and Collins (n 4)

¹²⁰ Rahat Azfar et al, 'HIV-positive patients in Botswana state that mobile teledermatology is an acceptable method for receiving dermatology care' (2011) 17(6) *Journal of Telemedicine and Telecare* 338-40; Achiamah Osei-tutu et al, 'Mobile teledermatology in Ghana: sending and answering consults via mobile platform' (2013) 69(2) *Journal of the American Academy of Dermatology* e90-1

request the advice of colleagues or supervisors, it is likely this practice will persist and potentially increase.

2.4 (c) A picture without words

One concerning finding from the interviews conducted for this paper with Australian dermatologists is that referrers now appear to provide *less* written or verbal information when sending photographs, on the assumption that clinical images are all that is required for an accurate diagnosis. Whilst this may be true in a proportion of cases (some conditions are “spot diagnoses” which have very characteristic findings), clinical context is often relevant, and sometime a necessity, for diagnosis and management. Even when a detailed history and examination findings are provided, it should be noted that the referring doctor may not be aware of specific questions to be pursued in a clinical history, or where and how to look for features on clinical examination. Consequently, it would be prudent of the recipient to actively communicate with the referrer to assess the quality of information provided, before a provisional diagnosis and treatment options are decided.

2.4 (d) Education required

As smartphone clinical photography becomes more prevalent and part of common practice, education on how to take accurate, consistent and representative smartphone photographs ought to ideally take place at medical school. The specialty training colleges could also consider an online tutorial that would likely suffice and could easily be distributed in a widespread manner. There should additionally be education on how to interpret clinical images, in the same way that all medical students are taught how to assess a basic chest x-ray. Some draft guidelines on features to assess in clinical images are outlined in Chapter 5.

2.4 (e) Attitudes towards the role of the smartphone in the supervisor/trainee relationship

The ability to send clinical photographs almost instantaneously to supervisors was valued by both registrars and consultants. It is important to note that a great deal of importance was placed by consultants on having a degree of familiarity with the knowledge and experience of individual registrars when determining whether information provided was sufficient and accurate.

Knowledge of the referring party's degree of training and conscientiousness is an aspect often missing in the registrar/referring junior doctor relationship during after-hours. The registrars are therefore placed in a more difficult position in determining whether an assessment, diagnosis and treatment plan can be made without physically reviewing the patient. As a result, in a case that is not entirely straightforward or non-urgent, it would be advisable to use clinical images for triage only, rather than in place of physical review, where physical review is reasonably possible. Where this is not reasonably possible, it would be advisable for the dermatology registrar to call the referrer and gain an understanding of the thoroughness of history and examination conducted, and whether the referring doctor is particularly concerned about the patient (or whether they should be), and to take a more proactive role in the teleconsultation process.

2.4 (f) The role of seniors and workplace administrators in influencing behaviour

The data from the qualitative interviews suggests that senior doctors have a significant role to play in changing the behaviour within their department regarding capture and transmission of clinical images. Additionally, where reasonably efficient software is provided by the workplace for capturing and uploading images, that software or method tends to be used by dermatology registrars.

Most respondents were uncomfortable with using smartphone technology in a manner

which did not protect patient privacy, or was against policy, and expressed a desire to both attain the best outcome for the patient and to “*do the right thing.*” Clinicians are genuinely concerned about patient privacy, but they require more support to enable them to securely transmit images in order to obtain input from a more experienced doctor. These attitudes suggest that interventions by supervisors and hospital administrators to encourage the use of efficient and secure methods for transmitting and uploading images are likely to be effective.

2.4 (g) Attitudes towards risk of medicolegal proceedings

Several respondents reported distress due to potential medicolegal consequences of capturing and transmitting patient images on smartphones, however this distress was not a large enough deterrent to discourage practitioners from regularly utilising smartphones to obtain advice. These findings suggest that campaigns to change smartphone practices that are based upon fear and playing upon threats such as loss of position, disciplinary proceedings or fines, are unlikely to be sufficient. Instead, practical solutions are required to enable doctors to obtain help for patients in an efficient, professional and secure manner.

2.4 (h) Legal issues associated with smartphone consultations

The legal issues associated with smartphone consultations are discussed in greater depth in the following chapter through the use of clinical scenarios. Important questions include whether a duty of care necessarily arises in the course of a smartphone consultation, what is required to discharge that duty of care, and whether a defence is available under s 50 of the *Civil Liability Act 2002 (NSW)* due to the prevalence of smartphone use for the provision of dermatological advice.

Issues that are currently poorly managed include consent and documentation. Consent to the capture, storage and transmission of clinical images is rarely completely informed, as

practitioners do not tend to actually manage clinical images in the way they intended to at the time of capture. Many have images on their devices long after the time of capture, and those images are often backed up to cloud services. How the image is managed at the recipient doctor's end is also rarely known to the sender, let alone discussed. Consent, where obtained, is rarely documented in writing. Such informal processes may leave practitioners and patients unprotected should a breach of privacy subsequently occur, and could provide the basis for disciplinary proceedings.

Failure to routinely transfer of the clinical image to the patient file is common and may create risks to patient safety. However, this issue may be significantly improved with practical support. The associated legal risks are discussed in greater detail in Chapter 3 and solutions to improve the ability to improve the ability to upload clinical images are reviewed in Chapter 4.

2.5 Conclusions

Current practice is fraught with a number of medicolegal risks. Consent is rarely informed and inconsistently documented. Upload of images to the medical record is not occurring frequently. The quality of clinical context provided by referring doctors is variable. The documentation of advice provided is often reportedly inaccurate. Each of these aspects gives rise to a number of significant risks to patient safety, and potentially to patient privacy. Familiarity with workplace policy was limited, however the knowledge that smartphone use is prohibited was not a significant deterrent to practitioners in continuing to use their smartphones. Accordingly a prohibitive approach is unlikely to be effective in changing physician behaviour.

Chapter 3 reviews liability issues that arise from smartphone use in dermatology. It argues that the risks to patients, practitioners and healthcare organisations are real, many and varied. Chapter 4 argues that the current policy position is untenable, and examines

potential solutions to the risks involved in smartphone consults, barriers to implementation of potential solutions, and who should be responsible for overcoming them.

Chapter 3: Liability

This chapter examines whether receiving or responding to a request for an opinion via smartphone necessarily gives rise to a duty of care, and if so, what is required to discharge that duty. Issues of consent, documentation, alterations to electronic records and the availability of a defence to negligence under s 50 of the *Civil Liability Act 2002 (NSW)* are also discussed. The legal concepts are explored through the use of fictional scenarios, informed in part by the experiences relayed by interviewees and colleagues, which highlight a variety of issues that may arise in clinical practice.

This thesis will focus on relevant Commonwealth and NSW law that applies to practitioners within NSW, including when a duty of care will arise in relation to smartphone consultations, institutional liability and potential defences to claims in negligence.

3.1 When does a referral for a teledermatology consultation give rise to a duty of care?

Doctors seek opinions from other doctors on a regular basis for senior, specialist, subspecialist or second opinions. This practice is beneficial to patients, who receive a further clinical opinion, and also to doctors, who learn through interaction and discussion with respected colleagues. A referral may be made in a number of ways. Formal consultations in private practice are ordinarily initiated via a written referral letter, the purpose of which is to inform the recipient doctor of the patient's clinical background and the reason for consultation. With technological developments, these letters may be sent via e-health systems or, in private practice, by email. There is no clear

obligation upon a private practitioner to accept a referred patient unless urgent or unusual circumstances are present (see discussion below regarding duty to respond in an emergency)¹²¹.

In the public health system, requests for consultations are routinely made from one team to another (for example, a general medical team may request a dermatology consultation for a diabetic patient who has developed an unusual rash). The decision to make such a request is usually made by a senior member of the team (consultant or registrar), however the request is usually submitted by the most junior member of the team (the intern or resident). Previously, standardised paper consultation sheets were used for such requests, with space for a clinical history and questions written at the top of the consult sheet, and space for the opinion of the consulted doctor to write below, although this approach is now increasingly rare. Consultations are more likely to be made by phoning or paging the registrar of the relevant specialty team, at which time the patient's details, history and clinical issues are verbally communicated, and a request is made for the registrar (and subsequently the consultant) to attend to the patient in person. In some hospitals, referrals are made electronically. There ought to always be a written record of a request for a consultation, either on paper or electronically, although in practice this does not always occur. Hospital policy ordinarily prescribes the time periods within which the patient must subsequently be seen by the recipient registrar and/or consultant from the specialty team (usually within 24 hours). The hospital or relevant medical institution likely owes a vicarious duty of care, and potentially a non-delegable duty of care to the patient to provide the general and speciality services that it purports to provide.¹²² To improve patient care and minimise risk, it would be in the interest of health institutions to improve ease of access to specialist opinion in a manner that protects privacy and confidentiality, as

¹²¹ *Albrighton v Royal Prince Alfred Hospital* [1980] 2 NSWLR 542, [42] and *Lowns v Woods* (1996) Aust Torts Reports 81-376.

¹²² *Ellis v Wallsend District Hospital* (1989) 17 NSWLR 553, at p 604B – p 605B, per Samuels JA, Meagher JA agreeing

long as the accuracy of the specialist opinion is not compromised by the modality of the consultation.

In addition to formal requests for consultation, advice is frequently requested in a far more informal manner, known as a “curbside” or “corridor” consult¹²³.

Corridor consultations are usually made without specifically identifying the patient and without provision of a comprehensive clinical history.

Consequently, advice in a corridor consult is ordinarily given in a general manner, without endorsement of a specific management plan for a specific patient. To date no curbside consultations have given rise to liability in Australia.

A duty of care owed by a doctor to a patient will clearly arise when a doctor [the “recipient doctor”] undertakes to perform a formal consultation¹²⁴, and it is likely that a duty similarly arises where consultants enter into formal telemedicine arrangements¹²⁵. The exact point at which a duty of care arises in the consultation process is unclear. It is unlikely that mere receipt of a referral alone is sufficient to give rise to a duty of care, without some other additional factor being present. In the public hospital setting, that additional factor may be the underlying contractual agreement to provide specialist services to patients within that hospital.

Some guidance on this question may be obtained from *Albrighton v Royal Prince Alfred Hospital*¹²⁶. In that case an opinion was sought by the orthopaedic surgery team from a neurosurgeon, Professor Gye, prior to applying traction to a patient with a large hairy naevus over the base of her spine. This naevus was

¹²³ Corridor consults enable doctors to enhance patient care by through discussing diagnosis, treatment and appropriate investigations with senior or subspecialist colleagues. Traditionally they have been conducted verbally and informally, often literally *in the corridor* of a medical practice or hospital

¹²⁴ *Rogers v Whitaker* (1992) 175 CLR 479 per Mason CJ, Brennan, Dawson, Toohey & McHugh JJ at [5]

¹²⁵ Medical Board of Australia, 'Technology-based patient consultations guideline' (2012), “Standards of patient care”

¹²⁶ *Albrighton v Royal Prince Alfred Hospital* [1980] 2 NSWLR 542

indicative of the possibility of an underlying spinal cord abnormality, which could (and did) lead to neurological harm with the application of traction. The request for specialist consultation was framed in the following terms on the Consultation Sheet:

“Dr Tyer would appreciate advice regarding significance of her hairy naevus with respect to spinal pathology and possible damages to cord of correction of scoliosis by halo-pelvic traction.”

Professor Gye, the Neurosurgeon, did not examine the patient nor take a history, but reportedly wrote on the consultation sheet in the space allocated for his opinion: *“As she has (just) had traction I will see her later in the week.”* The point at which a duty of care arises is discussed by Reynolds JA (with Hope & Hutley JJA agreeing):

“[42] By the notation he made on the document, it could be concluded that he accepted the assignment to tender advice as to a patient in the hospital in which he held an appointment.

...

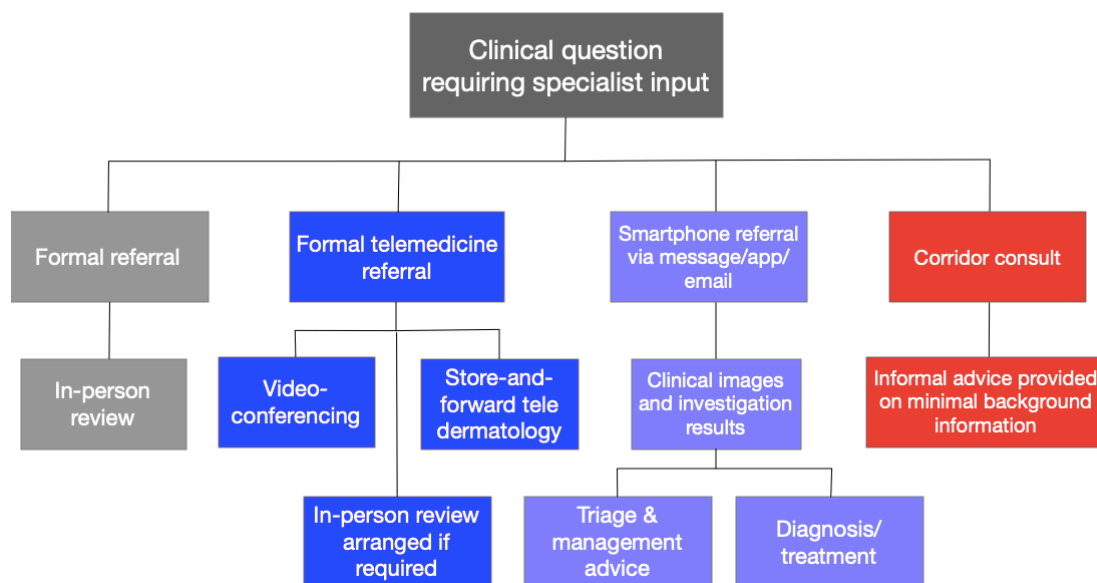
[43] The question arises as to whether a relationship could be held to exist, from that day, which imposed a duty of care upon the third respondent owed to the appellant. Apart from all else, it could be concluded that he knew and accepted that the question of the possible danger to the patient's cord would be to some extent dependent on his advice; and this factor alone, in my view, imposed a duty on him. She became, for relevant purposes, his patient. This being so, it seems to me that, in the knowledge he might be thought to have, his failure to intervene until proper investigation might be held to amount to a breach.¹²⁷”

The question of when a duty of care can be said to arise becomes more complicated when considering the broad spectrum of formality possible within

¹²⁷ Albrighton v Royal Prince Alfred Hospital [1980] 2 NSWLR 542 , [42]-[43]

referrals made via smartphone. In many respects, smartphone communications blur the division between corridor consultations and formal consultations (see **Figure 3-1** below). The ease of transfer of patient-specific information, including clinical and radiographic images, laboratory results and ECG tracings for review allows for a more detailed analysis of an individual patient’s case than is usually possible in a corridor consult. The result of this is that the usual criteria one might rely on to distinguish a regular consultation from a corridor consultation no longer provide clear guidance for the expected depth of engagement on the part of the responding practitioner.

Figure 3-1: - Types of Consultations between doctors



At present it is unclear whether smartphone requests for advice (“smartphone consultations”) give rise to a duty of care, and if so, what standard of care is to be applied. As long as the answer to this question remains nebulous, there will likely be inconsistency in the extent to which practitioners engage in the process of obtaining a complete history, documenting information, advice and images, and arranging follow-up for smartphone consults. Given the frequency

and volume of smartphone consults established through our survey results, it is only a matter of time until this question comes before the courts.

3.2 Could a duty of care arise in the course of a smartphone consultation?

A medical practitioner owes a patient a duty of care to exercise reasonable care and skill in the provision of professional advice and treatment¹²⁸. A duty of care may arise on the part of a doctor even if there is no direct contact between a doctor and the patient in question.¹²⁹ This includes situations where specialist doctors are requested to perform a formal consultation by another doctor on behalf of a patient¹³⁰. There is no case law in Australia which addresses whether a duty of care arises on behalf of the consulting doctor during informal, or “corridor” consultations, however several cases from various jurisdictions in the United States suggest a duty of care may arise in certain circumstances. One example of this is providing informal telephone advice¹³¹, and particularly in circumstances where the patient’s investigations have been reviewed¹³². In those cases, factors considered to favour the existence of a duty of care included reliance by the treating doctor on the opinion provided,¹³³ apparent assumption of responsibility and whether there were any pre-existing duties or arrangements for providing care¹³⁴.

There is no case law to date that explicitly recognises a duty of care arising in the context of a smartphone consultation in Australia. If such a duty were considered a

¹²⁸ *Rogers v Whitaker* (1992) 175 CLR 479 at [483]

¹²⁹ See for example *BT v Oei* [1999] NSWSC 1082; *PD v Harvey* [2003] NSWSC 487 and *Harvey & Ors v PD* [2004] NSWCA 97: doctors may owe a duty of care to sexual partners of their immediate patient and *Thomsen v Davison* [1975] QLD R 93 at p95

¹³⁰ *Rogers v Whitaker* (1992) 175 CLR 479 per Mason CJ, Brennan, Dawson, Toohey & McHugh JJ at [5]

¹³¹ *Cogswell v Chapman*, 249 AD2d 865, 672 NYS2d 460 (1998)

¹³² *Bovara v. St. Francis Hospital* 700 N.E.2d 143 (Ill. App. Ct. 1998)

¹³³ *Cogswell v Chapman*, 249 AD2d 865, 672 NYS2d 460 (1998); *Bovara v. St. Francis Hospital* 700 N.E.2d 143 (Ill. App. Ct. 1998) at 147; *Cogswell v Chapman*, 249 AD2d 865, 672 NYS2d 460 (1998) at page 462

¹³⁴ *Hand v Tavera* 864 SW2d 678 (CtAppTex, 1993) at [40].

novel duty, distinct from the recognised duty owed in the course of a formal consultation, several “salient features” would be considered in determining whether a duty ought to be imposed. These salient features were summarised by Allsop J in *Caltex Refineries (Qld) v Stavar*¹³⁵. [Sections 5B](#) and [5C](#) of the [Civil Liability Act 2002](#) do not detract from or modify this approach¹³⁶. Even if the duty is not considered to be novel duty, but rather the ordinary duty that a consulting doctor owes to a patient, these principles nonetheless provide a useful framework for exploring the duties that arise in typical clinical scenarios involving teledermatology.

The salient features outlined in *Caltex Refineries* are considered below in the context of determining whether a duty of care may arise on the part of a recipient doctor conducting a smartphone consultation, should a claim in negligence arise.

Salient Features

(a) Foreseeability of harm

Foreseeability of significant harm would be easily established in a case where a patient is negligently misdiagnosed, or incorrect treatment is provided. The chances of such an error occurring in a smartphone consultation are arguably higher due to the risk of provision of inaccurate or incomplete information by the referring doctor¹³⁷.

¹³⁵ *Caltex Refineries (Qld) Pty Ltd v Stavar & Ors* [2009] NSWCA 258 (31 August 2009) at [130]

¹³⁶ *C S v Anna Biedrzycka* [2011] NSWSC 1213 at [22]

¹³⁷ Burden M, Sarcone E, Keniston A, Statland B, Taub JA, Allyn RL, et al. Prospective comparison of curbside versus formal consultations. *Journal of Hospital Medicine*. 2013;8(1):31-5: A prospective study of corridor consultations which were followed immediately by formal (in-person) consultation by another physician found that information was incomplete or inaccurate in 51% of cases, and that management advice after formal consultation differed from that given in the curbside consultation for 60% of patients; when inaccurate or incomplete information was received, the advice provided in the formal consultation as compared to curbside differed in 92% of patients (P<0.0001)

(b) The nature of the harm alleged, and (j) the nature or the degree of the hazard or danger liable to be caused by the defendant’s conduct or the activity or substance controlled by the defendant

Provision of medical advice often involves the process of diagnosis and/or management. If incorrectly performed, this may result in significant harm, although the degree of risk will vary depending upon the circumstances of the consultation. For example, misdiagnosis of a discrete lesion of psoriasis as tinea is unlikely to cause any significant harm to the patient in the short or longer term, whereas a misdiagnosis of a melanoma may be fatal to the patient.

(c) The degree and nature of control able to be exercised by the defendant to avoid harm

The degree and nature of control exercised by the defendant may depend on a number of factors, including the possession, or profession, of specialist knowledge. The ability to accept admissions to a hospital or provide urgent face-to-face follow-up care may also arguably inform the degree of control the defendant is capable of exercising.

(d) The degree of vulnerability of the plaintiff to harm from the defendant’s conduct, including the capacity and reasonable expectation of a plaintiff to take steps to protect itself

The vulnerability of a plaintiff may depend on the degree of expertise possessed or professed by the recipient doctor, and the likelihood that the referring doctor would act predominantly in accordance with the recipient doctor’s opinion. Where contact is made directly between a patient and the dermatologist, the vulnerability of the

patient is clear due to the gradient of medical knowledge between the parties.

e) The degree of reliance by the plaintiff upon the defendant

This may depend on the degree of expertise of the defendant, particularly in comparison to a treating doctor who is requesting advice. Where the recipient doctor is the most qualified of the two to provide advice it may be considered likely that the recipient of that advice will rely upon it.

The purpose of the consultation may also be relevant, such as whether the advice is a request for diagnosis, interim management until the patient can be seen by a more experienced doctor, or for routine follow up. The complexity of the patient's presenting complaint and medical history, the degree of information provided by the treating physician and the degree of certainty with which advice or recommendations are expressed may also be relevant to this consideration.

(f) Any assumption of responsibility by the defendant

This consideration may turn on a number of factors, including the degree of involvement and interaction on the part of the defendant, the defendant's pre-existing duties to provide supervision or on-call or peripheral coverage, pre-existing arrangements with primary care providers to provide telemedicine services, the content and expressed certainty of the actual advice given and whether a diagnosis, treatment plan or follow-up plan is provided.

(g) The proximity or nearness in a physical, temporal or relational sense of the plaintiff to the defendant

Although physical proximity is necessarily not a feature of telemedicine, temporal proximity could easily be established.

(h) The existence or otherwise of a category of relationship between the defendant and the plaintiff or a person closely connected with the plaintiff

This criteria may be influenced by any pre-existing knowledge of the patient from prior interactions, a duty to otherwise provide remote or in-person on-call cover to potential patients of a hospital or practice, a responsibility to provide supervisory services of junior doctors managing the patient or a prior agreement to provide care.

(i) The nature of the activity undertaken by the defendant

The type and modality of interaction via smartphone consultation may vary, from a telephone or video-conference consultation, to a hybrid telephone or video-conference consultation with supplementary clinical photographs, or a store-and-forward consultation with clinical photographs accompanied by text or email. The request may be for simple management advice for a patient with a known diagnosis, assistance with diagnosing a new patient, or a request to determine whether face-to-face review is in fact required.

An outline of the types of consultations that typically take place over the telephone, and presumably smartphone, emerges from the evidence adduced in *Health Services*

*Union NSW v Director-General, New South Wales Ministry of Health*¹³⁸. In that case, a declaration was sought from the Industrial Court of NSW that:

“Employees covered by the Public Hospital (Medical Officers) Award who provide a ‘clinical appraisal’ over a telephone or by email, rather than via a computer, have provided a ‘clinical appraisal remotely’ without onsite presence and are entitled to a minimum payment of one hour’s pay at overtime rates pursuant to cl 12(ix) of that Award.”

In that case evidence was led from multiple doctors as to the categories of calls typically received by registrars. One witness classified these calls as follows:

- “1. Doctor or nurse: ‘This is the situation with patient X, we think you should come in now’;*
- 2. Doctor or nurse: ‘This is the situation with patient X, could you please provide some advice’;*
- 3. Doctor or nurse: ‘This is the situation with patient X, we wish to admit the patient under your team with the following plan ... would you please confirm your agreement to the admission and treatment plan or provide alternative instructions’;*
- 4. Anybody making the call: ‘Just letting you know’ ... (in general something administrative, not requiring opinion or advice related directly to patient care, e.g. ‘Theatre has been delayed by an hour’);*
- 5. Patient outside hospital (typically: oncology or haematology patients): ‘This is my current situation, what should I do?’”*

Where an admission or a treatment plan is agreed to between the referring doctor and the doctor being consulted, it is highly likely that a duty of care will arise. Where advice is provided and the doctor already has responsibility to see the patient which arises from underlying contractual obligations to provide cover, a duty of care likely arises. Where a patient outside the hospital calls, who has a pre-existing relationship with the doctor, and the doctor provides any advice other than to come into the hospital for assessment within an appropriate time frame, a duty may arise. Where administrative updates are provided which may have some clinical significance and a

¹³⁸ Health Services Union NSW v Director-General New South Wales Ministry of Health [2013] NSWIRComm 21 (22 March 2013)

response is inadequate, a duty of care may also arise.

(k) Knowledge (either actual or constructive) by the defendant that the conduct will cause harm to the plaintiff

This is unlikely to arise in the context of advice provided during a smartphone consultation, as errors are likely to be inadvertent rather than knowingly committed. However, in situations where clinical information or advice is not transferred in a timely manner to the medical record where other treating practitioners may review them, it is possible that constructive knowledge of potential harm may be imputed, should conflicting treatment be commenced due to the lack of adequate records.

(l) Any potential indeterminacy of liability

Indeterminacy of liability may occur in cases of infectious diseases, where a failure to diagnose a patient, the subject of the initial consultation, results in infection of other parties.

(m) The nature and consequences of any action that can be taken to avoid the harm to the plaintiff

Some relevant general considerations to this question may be whether the defendant, when performing a phone consultation, could:

- Attend the patient in person for a physical review, which is the current gold standard, assuming that time permits
- Seek further information to clarify details of the patient's history and presentation

- Discuss the matter with a senior doctor onsite to clarify details of the referral and patient presentation
- Seek clinical images or look up radiological investigations or laboratory results.
- Other potential actions will depend on the particular circumstances of the case.

(n) The extent of imposition on the autonomy or freedom of individuals, including the right to pursue one's own interests;

An imposition of a duty to respond outside of rostered hours to smartphone consultations, or to treat requests for advice as a complete consultation, may be seen to impact upon the autonomy and freedom of individual doctors (usually junior doctors). However, often doctors in this position are already obliged to provide advice and attend in person where required by their Award and contract with their local area health service, and being able to respond by smartphone is likely less of an imposition than other modes of communication or physical attendance.

This is particularly relevant given the volume of such communications illustrated by survey data in Chapter 2, and the considerable amount of time required to perform these assessments thoroughly and appropriately.

(o) The existence of conflicting duties arising from other principles of law or statute, and (p) consistency with the terms, scope and purpose of any statute relevant to the existence of a duty

It is unlikely that these factors will provide protection. Providing medical assessment via smartphone is not necessarily in conflict with other laws. Contravention of privacy laws need not occur if appropriate software is used or care is taken with transmission of patient data.

(q) The desirability of, and in some circumstances, need for conformance and coherence in the structure and fabric of the common law.

There is certainly need for conformance and coherence in this area of the law, with a sufficient degree of flexibility to adapt to developments in technology.

These salient features are further addressed in greater detail in the following hypothetical scenarios. Each hypothetical scenario is broken into three variations, and is numbered and analysed accordingly.

It is important to note that the question of whether a duty of care is owed by a doctor conducting a smartphone consultation may be less relevant if the smartphone consultation takes place in the public hospital setting. This is because the hospital would owe the patient a non-delegable duty of care to provide appropriate medical care, and may also be directly liable for a failure to institute systems to enable safe transmission of clinical information between practitioners. The issues of vicarious and direct liability have far broader and more significant implications for hospitals and the government health agencies responsible for funding and managing them.

Scenario 1A: After-hours

Alana is a 24 year-old woman who presents at 10.30pm to the Emergency Department at St John's Hospital with mild flu like symptoms including fever, headache, sore throat and malaise and recent onset of a disseminated rash. Her medical history is unremarkable except for a motor vehicle accident several years ago in which she sustained multiple fractures and a lacerated spleen, which required splenectomy¹³⁹. She is reviewed by Dr Kaplan, an emergency resident and employee of St John's Hospital.

On examination Alana has a low-grade fever at 37.8 degrees¹⁴⁰, her blood pressure is 95/60, heart rate 95 and respiratory rate 18. She has no focal neurological signs and no signs of meningism¹⁴¹. She appears dehydrated so Dr Kaplan prescribes IV fluids and paracetamol. Following these Alana reports feeling somewhat improved.

Dr Kaplan's supervisor reviews the patient's case, and tells Dr Kaplan to request an opinion from the Dermatology registrar, Dr Andrews, also an employee of St John's Hospital. Dr Kaplan informs Dr Andrews her patient is afebrile, has mild flu-like symptoms and a widespread rash, which she describes as "maculopapular". Dr Andrews asks Dr Kaplan to check whether the lesions are blanching, and to send him some photographs of the lesions before he decides whether he needs to come into the hospital.

139 Splenectomy refers to removal of the spleen. Not having a spleen puts a patient at an increased risk of infections, including meningococcal infections.

140 Note that meningococcaemia is not always accompanied by clinical signs of meningitis.

141 A maculopapular eruption resembling a wide variety of viral exanthems (rashes), particularly rubella, can be an early finding in meningococemia.

Dr Kaplan attempts to blanch¹⁴² the lesions. She doesn't have much dermatology experience but it seems to her that the lesions are at least partially blanching. She sends 8 photographs to Dr Andrews' mobile via SMS. Only 6 of these photographs load on Dr Andrews' phone, and he is unaware that he is missing the final 2 photographs in the series. The first 6 photographs show a faint, maculopapular, non-specific rash, which could be consistent with a viral exanthem¹⁴³. The final photo, although poorly lit, shows an area of 1-2 mm petechiae across her hips where her jeans have rubbed against her skin.

Dr Andrews, unaware that the patient is asplenic, has petechiae and a low-grade fever, advises that this is likely a viral infection and it would be appropriate to discharge the patient.¹⁴⁴ He asks her to advise the patient to return to ED if her condition deteriorates, or to the dermatology clinic the following week for review if the condition did not resolve.

Dr Kaplan uploads all 8 of the photographs to the electronic medical file, with the following note:

“Phone discussion with Dr. Andrews, dermatology reg with remote review of photographs (attached). Per Dr A: likely viral exanthem. Discharge with paracetamol, encourage fluid intake. Patient to return if deteriorates and otherwise attend dermatology clinic next Monday if not resolving.”

Alana is discharged home. The following morning she is rushed in by her flatmate in a profoundly septic state with meningococcaemia. Despite treatment, her lower limbs become gangrenous and require amputation.

¹⁴² When you put some pressure on a pink or red lesion, if it is “blanching” it will briefly return to regular skin colour. Non-blanching lesions should lead a clinician to consider vasculitis (a potentially very serious condition which may affect multiple organs, and which has a number of potential causes, one of which is meningococcal infection).

¹⁴³ Petechiae and ecchymoses (non-blanching lesions) are classic findings in meningococcaemia but may not be present early in the course of the disease. “Exanthem” is the medical term for a widespread rash.

¹⁴⁴ A patient with no spleen is more prone to certain types of infections, so knowledge of this fact would ordinarily prompt closer monitoring of a patient to ensure infective processes are not missed.

Scenario 1B: Failure to attend in person when reasonably possible

In this variation of the scenario, Alana presents with the same signs and symptoms at 10am. Dr Banda, an employee of St John's Hospital, is the dermatology registrar rostered to respond to requests for consultation on-site at the time of referral during the day. When he receives the phone call about Alana, he is very busy in an overbooked clinic and does not anticipate being able to attend Emergency for several hours, which would result in a breach of the Emergency Department's (ED) National Emergency Access Target (NEAT¹⁴⁵). ED is pressuring Dr Banda for a decision; he decides to provide an opinion via smartphone.

Scenario 1C: Informal arrangements with private practitioners

In this variation of the scenario, Alana presents to St John's Hospital at 8pm and there is no public dermatology service on site.

Dr Cusack is a private dermatology consultant who practices nearby, and who has informally agreed to provide dermatology advice to colleagues as a courtesy, as their hospital has no formal arrangements with a tertiary centre for dermatology referrals and he would like to improve outcomes for patients. Dr Kaplan has (in error) only sent him the first 6 photographs, but uploads all 8 to the patient's electronic record with the above note.

¹⁴⁵ Patients are required to be admitted to the hospital, discharged or transferred within 4 hours of presentation: Claire Sullivan et al, 'The National Emergency Access Target (NEAT) and the 4-hour rule: time to review the target' (2016) 204(9) *Medical Journal of Australia* 354.

Dr Cusack has not made any note of the advice he provided in relation to this patient, and for privacy reasons has deleted the photographs he has received from his phone.

3.3 – Analysis of Scenario 1

3.3 (a) Duty of Care

In Scenario 1A & 1B, St John’s Hospital would owe the patient a non-delegable duty of care, and be vicariously liable for the actions of its employees, including Dr Kaplan, her supervisor and the employed dermatology registrars for the failure to probe and communicate any “red flags” (in this case, the patient’s asplenia and low-grade fever, which ought to have prompted further investigation).

This does not preclude a concurrent duty of care on the part of a responding dermatologist or dermatology registrar.

Dr Andrews (1A) & Dr Banda (1B) would owe a duty of care to the patient on the basis of their contractual obligations to the hospital to provide assistance with dermatology patients. The source of this obligation, depending on the workplace, may depend on a combination of an employment contract, workplace policies and rosters indicating after-hours coverage.

Regarding Dr Cusack (1C), even in the absence of formal pre-existing contractual obligations, a duty of care may nonetheless arise. The foreseeability that harm to the patient may result should his advice be incorrect would further support a finding that a duty of care does arise. The nature of the arrangement between Dr Cusack and the hospital may also influence whether a pre-existing relationship is thought to exist between the two. This may depend

on factors such as whether he is paid for his services, or routinely follows up on patients he has provided phone advice on subsequently in his private rooms, for example.

The degree of Dr Cusack's engagement in this scenario in requesting the patient's photographs and eliciting history and further examination findings and then providing advice regarding management, may arguably amount to an assumption of responsibility on his part – with corresponding reliance by the referring doctor¹⁴⁶ and the patient who ultimately accepts and enacts the specialist's advice. Once advice is given upon the medical history and examination findings provided, reliance upon that advice may be considered reasonable, because the dermatologist possesses (or apparently professes) special skill in the matter being advised upon.

It is particularly unfortunate that with each step taken towards improved medical practice, including requesting more information, offering assistance and ensuring appropriate follow-up, may increase the risk of being found to owe a duty of care. Taking these steps should not be discouraged in a bid to avoid liability, because it is through attention to detail and obtaining a thorough history, examination findings and high-quality clinical images that appropriate medical care is ultimately delivered. Each of these steps make mistakes less likely, thus decreasing the risk of breach of duty being found, and are required in any event by the profession's code of conduct¹⁴⁷.

If Dr Cusack framed the advice differently, for example reporting that he was unable to definitively give an opinion due to poor quality photographs, reliance on that advice would be less reasonable. However, if there is uncertainty as to diagnosis or management, it would be prudent to:

¹⁴⁶ *Caltex Refineries (Qld) Pty Limited v Stavara* [2009] NSWCA 258 at [103].

¹⁴⁷ Medical Board of Australia, 'Good Medical Practice: A Code of Conduct for Doctors in Australia' (2017), s2

- notify the patient or referring doctor of the uncertainty and request further information, or
- suggest review by another modality, and
- convey to the referrer any life-threatening or serious conditions that must be excluded.

In addition to seeking further information on a case by case basis, it would be worthwhile to include information in the response to each consultation which alerts the referrer to red flags which they may not yet have considered. Such a warning could be customised for the field of practice of a recipient, along the following lines:

“If the patient satisfies any of the following:

- *Is systemically unwell*
- *Is immunosuppressed*
- *Has lesions in their eyes, mouth or on their genitals*
- *Is breathless*
- *Has renal, cardiac or liver dysfunction*
- *Has neurological symptoms*
- *If any non-blanching rash, necrotizing rash or blisters are found, or*
- *If you or your supervisor are otherwise concerned about the patient*

Notify me promptly.”

Such a notification would serve to protect all parties, including the patient, and may provide a teaching point for the referring doctor. It may also serve to define the scope of the duty of the doctor being consulted, as the onus is now placed upon the referring doctor to ensure that certain urgent factors are assessed and highlighted in the consultation. It makes plain that the recipient doctor’s specialist opinion is to be understood in the broader context of the ongoing responsibilities of the referring doctor.

Another relevant factor is the issue of control over the source – or the circumstances creating – the risk¹⁴⁸. Considerations pertinent to the question of control may include the recipient doctor’s capacity to admit patients to a hospital and provide urgent follow-up care. Dr Cusack (1C) does not have admitting rights, however this lack of control would not likely be sufficient to outweigh assumptions of responsibility and reliance.

A factor that may weigh against imposition of a duty of care include statutes that potentially conflict with smartphone transmission of clinical images. These include the *Health Records and Information Act 2002 (NSW)* and the *Privacy Act 1988 (Cth)*¹⁴⁹, which require patient information to be transmitted and held in a manner which reasonably safeguards against disclosure or unauthorised access¹⁵⁰. If doctors are unable to perform transmission and documentation in a manner consistent with legislation, this may be inconsistent with an imposition of a duty of care. Whilst images may be de-identified, clinical images used to obtain a medical opinion which need to be subsequently uploaded into the correct patient file, will need to be correctly identified to have this utility. However, infringement of the above Acts is not an inevitable outcome of any smartphone consult, particularly if care is taken to transmit photographs and patient information in a secure manner. While this is currently difficult in practice, the ability to do so will likely improve with time and the fine-tuning of purpose-built apps entering the market¹⁵¹.

Courts may also consider what actions may be taken to reduce the likelihood of harm to patients, and the degree of inconvenience involved in doing so. In these scenarios, developing a systematic approach for reviewing clinical images, and assessing the presence of “red flags” such as immunosuppression,

¹⁴⁸ *Caltex Refineries (Qld) Pty Limited v Stavara* [2009] NSWCA 258 at [103](c).

¹⁴⁹ *Privacy Act 1988 (Cth)*, Schedule 1 (Australian Privacy Principle 11)

¹⁵⁰ *Health Records and Information Privacy Act 2002 (NSW)*, Schedule 1, Health Privacy Principle 5(3)

¹⁵¹ Slay Pty Ltd, 'Your clinical pics aren't safe without PicSafe®') <<https://picsafe.com/au/>>; MedApps, AfterHours: Removing Clinical and Handover Gaps <<https://medapps.com.au/demonstration/>>; Health Care Innovate Pty Limited, 'Clinivid - connect with any clinician') <<https://clinivid.com.au/>>

are simple steps that could improve the overall safety of the smartphone consultation process.

In summary, whether a duty of care will arise will depend upon the particular circumstances of each case, although it is entirely possible that a recipient doctor engaged in a smartphone consultation may be found to owe a duty of care to patients who are the subject of consultations. Accordingly, it would be prudent to ensure that the consultation is given due consideration, sufficient questions are asked to ensure adequate information has been received, advice is documented, and responsibility for follow-up of the patient is clarified.

3.3 (b) Breach of Duty of Care

In NSW, the standard of care is to be determined in accordance with the common law as modified by s5B of the *Civil Liability Act 2002 (NSW)*. Section 5B provides:

“A person is not negligent in failing to take precautions against a risk of harm unless:

(a) the risk was foreseeable (that is, it is a risk of which the person knew or ought to have known), and

(b) the risk was not insignificant, and

(c) in the circumstances, a reasonable person in the person's position would have taken those precautions.

(2) In determining whether a reasonable person would have taken precautions against a risk of harm, the court is to consider the following (amongst other relevant things):

(a) the probability that the harm would occur if care were not taken,

(b) the likely seriousness of the harm,

- (c) *the burden of taking precautions to avoid the risk of harm,*
- (d) *the social utility of the activity that creates the risk of harm.*

Whether the duty of care has been breached by a recipient doctor in the course of a smartphone consultation is a question of fact¹⁵². Whether the recipient exercised reasonable care in giving their advice is a question of fact to be judged prospectively at the time before any adverse event occurs¹⁵³. The process involves identification of a reasonable person's response to foresight of the risk of occurrence of the injury which the plaintiff suffered.

In Scenarios 1A & B, the risk of harm to the patient is foreseeable in that an incorrect diagnosis and incorrect management advice may lead to a delay in appropriate treatment, causing injury or death. The probability of harm, and likely seriousness of that harm, will depend on the nature of the patient's condition and presentation.

The standard of care in medical negligence cases is "that of the ordinary skilled person exercising and professing to have that special skill"¹⁵⁴. In this case, the standard to be applied would be that of the ordinary skilled dermatologist providing dermatological advice (in this case, teledermatological advice). In the case of a smartphone consultation, two main factors are relevant:

1. Was the decision to conduct a remote review appropriate in the circumstances?
2. If so, was the remote review appropriately conducted?

¹⁵² *Naxakis v Western General Hospital* 197 CLR 269 at [39], *Roads and Traffic Authority of NSW v Dederer* (2007) 234 CLR 330 at [65]

¹⁵³ *Roads and Traffic Authority of NSW v Dederer* per Gummow J at [65]

¹⁵⁴ *Rogers v Whitaker* (1992) 175 CLR 479 judgment of Mason CJ, Brennan, Dawson, Toohey and McHugh JJ at [5]

If a remote assessment is to be undertaken, the practitioner must first determine whether remote assessment is appropriate and, in particular, whether a direct physical examination is necessary¹⁵⁵. When a practitioner is *on-site* on hospital grounds and receives a request to review a patient, it would ordinarily be expected that a face-to-face review would take place (that is, Dr Banda's (1B) decision not to attend ED due to his patient load in clinic is likely to be viewed critically in retrospect).

Phone calls to specialty teams requesting advice and/or admission under that team have been common practice after-hours for many years.¹⁵⁶ Requiring a specialist face-to-face review of every slightly complex out-of-hours patient would be impractical and costly, particularly in other specialties with a very high workload of on-call cases. Further, the ease of access to specialist opinion via smartphone may result in an unreasonable burden in terms of workload, which in the absence of adequate staffing and support may limit the ability of the recipient doctor to provide a thorough assessment for each request for consultation. This may lead to an excessive demand on the doctor's time, particularly when considered within the context of the doctor's in-hours role.

For other medical and surgical specialties, there is ordinarily a general medical registrar and a general surgical registrar on-site to review patients overnight¹⁵⁷. If further advice is required, or the patient needs admission, that registrar would ordinarily contact a supervising consultant by phone to discuss the patient's case and determine an interim plan until the patient is reviewed face-to-face by a specialist the following day. Whilst the emergency consultant or medical registrar may previously have been called to review patients with a

¹⁵⁵ Medical Board of Australia, 'Guidelines for Technology-based patient consultations' (2012) at [2]

¹⁵⁶ William Alazawi et al, 'Maintaining clinical governance when giving telephone advice' (2013) 4(4) *BMJ Journals: Frontline Gastroenterology* 270-277; Maria Cartmill and Barrie D. White, 'Telephone advice for neurosurgical referrals. Who assumes duty of care?' (2001) 15(6) *British Journal of Neurosurgery* 453-5; *Health Services Union NSW v Director-General New South Wales Ministry of Health* [2013] NSWIRComm 21 (22 March 2013) – a case involving discussion of what constitutes a "remote assessment" by a junior doctor on-call for the purposes of remuneration.

¹⁵⁷ These registrars may be doctors who have practiced for only 1-2 years.

rash in person, patients with skin disease are increasingly being reviewed by dermatology registrars via smartphone instead (see Chapter 2).

Some guidance in determining whether remote appraisal is appropriate can be gleaned from the Medical Board of Australia's *Technology-based Patient Consultations Guidelines*¹⁵⁸, the terms of which are echoed in the most recent *NSW Public Hospital Medical Officers (State) Award*¹⁵⁹ (April 2018). These documents outline the process of receiving telephone calls or emails whilst on call, and relevant considerations, which include whether a sufficient clinical history can be obtained over the phone, and whether it is necessary to direct that a further examination be conducted. Follow-up arrangements must also be provided, including subsequently reviewing the patient in person if appropriate. Notably, the Award also requires doctors to comply with relevant NSW Health and local policies, procedures and directions¹⁶⁰, which currently restrict text messaging and emailing of clinical images in most circumstances¹⁶¹.

There is provision for remuneration for a report provided by an on-call registrar on the basis of images forwarded electronically in circumstances where *"had the communications technology involved not been utilised, the registrar would have had to have returned to the workplace to provide that report; and there has been prior approval at the facility level to the use, and the conditions of use, of such technology by the registrar."*¹⁶²

Whether it would be appropriate to proceed via remote assessment may be affected by a number of factors, including but not limited to patient factors,

¹⁵⁸ Medical Board of Australia, above n 155 at [2]

¹⁵⁹ Industrial Relations Commission of New South Wales, "Public Hospital Medical Officers (State) Award 2018", Clause 11 (xi)

¹⁶⁰ *Ibid*, 11(xi)(a)(9)

¹⁶¹ New South Wales Health, Electronic Information Security Policy - NSW Health Policy Directive No PD2013_033 11-Oct-2013) at page 17: "Communication standards such as email, FTP, telnet, Mobile SMS, instant messaging and web traffic (HTTP) are not considered secure and should be avoided."

¹⁶² Industrial Relations Commission of New South Wales, "Public Hospital Medical Officers (State) Award 2018" (April 2018) at 11(xi)(b)

such as the complexity of the patient, and the nature and potential severity of their condition. Some medical conditions may be considered generally inappropriate for diagnosis or treatment without a thorough clinical history and physical examination, as discussed in the decision of the Victorian Board of Medical Practitioners *Re: Dr Dimitra Panagiotopoulos*¹⁶³. In this case a general practitioner diagnosed and treated erectile dysfunction on the basis of a brief telephone conversation with the patient and office staff, and a faxed questionnaire. Uncontested expert evidence was accepted that a cardiovascular examination is necessary prior to a diagnosis of, and treatment of, erectile dysfunction, and a finding of unsatisfactory professional conduct was entered under the *Medical Practice Act 1994* (VIC) s45(1)(a). A finding of unsatisfactory professional conduct may support a claim in negligence, for if it can be established that the practitioner's conduct demonstrates the *"knowledge, skill or judgment possessed, or care exercised, by the practitioner... is significantly below the standard reasonably expected of a practitioner of an equivalent level of training or experience"*¹⁶⁴, the practitioner has also likely breached the duty of care to exercise reasonable care and skill in the provision of professional advice and treatment.

Medical practitioner factors may also be relevant, such as whether the referring doctor has the requisite skills or equipment to perform an adequate assessment of the patient to relay essential information. It may be quite difficult for the recipient doctor to properly evaluate the referring doctor's level of skill, and thereby decide whether it would be appropriate to rely on the information communicated. In reality, human factors may also impact on the decision-making process by a recipient doctor, although from a legal perspective they are unlikely to have much weight in court proceedings. These may include the distance to travel to attend the hospital, how many times the doctor has already attended the hospital that evening, the time of night,

¹⁶³ Re: Dr Dimitra Panagiotopoulos [2004] MPBV 16

¹⁶⁴ Health Practitioner Regulation National Law 2009 (NSW) s139B

whether they have a day shift to wake up for in a matter of hours, or looming examinations which require rest in order to study effectively. Although policies relating to employment of doctors tend to underestimate or disregard the impact of human factors, an accurate understanding of their contribution to medical errors is of great importance¹⁶⁵.

In the case of Dr Andrews (1A), whether the duty of care has been breached is a question of fact¹⁶⁶. Evidence would be required as to whether it was appropriate for Dr Andrews to rely upon the referring doctor's description of the observations (temperature, blood pressure, heart rate and respiratory rate) or to ask for these readings to be individually provided. There would likely be a spectrum of opinion on this question, however those experienced with dealing with junior doctors over the telephone would likely be more alert to the possibility that borderline observations may be reported as normal.

In scenario 1C, if Dr Cusack has agreed to conduct a clinical appraisal remotely, and a duty of care is found to arise, he is arguably required to proactively obtain sufficient information about the patient in order to discharge his or her duty of care, as per the Medical Board of Australia's *Technology-based Patient Consultations Guidelines* which require a recipient doctor to "*accept ultimate responsibility for evaluation of information used in assessment and treatment, irrespective of its source*".¹⁶⁷

The failure to probe the referring doctor about preceding medical history or any factors which could indicate immunosuppression (such as the lack of a spleen) may be viewed critically by other practitioners, although some

¹⁶⁵ A great deal could be learned from the aviation industry in this respect, where human factors are acknowledged, and significant measures are taken to ensure adequate training to recognise such issues, as well as appropriate levels of staffing and proper rest between shifts: Civil Aviation Safety Authority, "Human Factors," published 3 March 2020: <<https://www.casa.gov.au/safety-management/landing-page/human-factors>> accessed 4 September 2020_d

¹⁶⁶ Naxakis v Western General Hospital 197 CLR 269

¹⁶⁷ Medical Board of Australia, above n 155

interviewees (see Chapter 2) were of the view that it was sufficient to provide an opinion with a caveat that the accuracy of the advice may be limited by the information provided. It is arguable that a recipient doctor *ought* to be able to rely on the information provided as an adequate summary of the relevant factors. This much was accepted in the case of *Sherry v Australian Conference Association*¹⁶⁸, where Simpson J suggested that the recipient doctor of a telephone consultation was “entitled to rely upon the [referring doctor] to convey the important information”¹⁶⁹. However in that case, the recipient doctor was preparing to immediately attend the hospital and assess the patient himself, and it was noted that “for every additional question asked by [the recipient doctor] on the telephone, a further delay was entailed in his leaving home and arriving at the hospital”¹⁷⁰. Such findings are unlikely to apply in any consultation completed entirely remotely without imminent face-to-face review.

It would be unusual for any consultation to proceed without some further questions being asked by the recipient doctor. This is because the recipient doctor has a greater degree of specialised knowledge and experience, and they will often be aware of signs and symptoms to look for in potential differential diagnoses that may not be known to the referring doctor. The recipient doctor would ordinarily seek to determine whether there was a presence or absence of any of these clinical signs or symptoms which may aid in diagnosis and determining treatment. Whether a failure to specifically seek out this information is negligent, will depend on the evidence submitted as to the conversation between the two doctors, and expert evidence as to the adequacy of inquiry by the recipient doctor.

¹⁶⁸ *Sherry v Australasian Conference Association (trading as Sydney Adventist Hospital) and 3 Ors* [2006] NSWSC 75 at [546]

¹⁶⁹ *Ibid* at [529]

¹⁷⁰ *Ibid* at [529]

The fact that the advice was provided on the basis of only 6 of the 8 photographs highlights the potential failings of technology, and the general lack of awareness that these failings may occur. Referring and recipient doctors rarely discuss how many photographs have been sent in total; so such a mistake is unnervingly easy to make. It is unclear who would bear the onus for determining whether a complete set of photographs has been sent. However, the onus regarding this may be compared to the onus to ensure that relevant clinical findings have been sought, assessed and communicated. For example, the fact that the image showing petechiae was not sent may have been remedied by a question by the recipient doctor as to whether there were any petechiae on examination. It is certainly possible that either, or both the referring doctor and recipient doctor may be liable for a failure to ascertain and communicate information relevant to the consultation.

3.3 (c) Is the recipient doctor required to document the interaction, or is it sufficient to rely upon the referring doctor to do so?

When a formal consultation takes place in a face-to-face setting, the doctor providing specialist advice would undoubtedly be required to ensure the interaction was documented appropriately, and the outcome communicated to the referring doctor in writing. Documentation is required because “maintaining clear and accurate medical records is essential for the continuing good care of patients”¹⁷¹. If a “*technology-based consultation*” is performed, which includes any consultation “*outside the traditional face-to-face setting*”, the recipient doctor is required to keep an appropriate record of the consultation as per the *Medical Board of Australia’s Guidelines for Technology-based patient consultations*.¹⁷² The above codes of conduct, adopted by the Medical Board of Australia, are admissible in legal proceedings to establish appropriate professional conduct for the medical

¹⁷¹ Medical Board of Australia, “Good Medical Practice: A Code of Conduct for Doctors in Australia” (March 2014) at [8.4]

¹⁷² Medical Board of Australia, ‘*Guidelines for Technology-based patient consultations*’ (n125)

profession.¹⁷³ Further, there is a statutory requirement under the *Health Records and Information Privacy Act 2002 (NSW)* s25 for such health records to be kept for 7 years for adults, and for children until that child has reached the age of 25.

Whilst uploading of clinical images to the patient's file by the referring doctor is certainly required, it is less clear whether Dr Cusack (1C) is also obliged to store clinical images received. Whether or not he is legally obliged to do so, it would certainly be advisable from a medicolegal perspective to retain any images upon which advice had been provided. Dr Cusack would be at a particular disadvantage should medical negligence proceedings arise in this case, as his failure to securely store the images he was sent would result in him being unable to establish that he did not receive the image depicting petechiae. Whilst he may have in any event breached his duty of care in other respects by failing to obtain sufficient history and examination findings, sending home a patient with petechiae without further assessment would be a particularly grievous error for a dermatologist.

In practice, it seems that most practitioners rely upon the referring doctor to document smartphone and telephone interactions (see Chapter 2). A significant problem with this approach, which became evident through qualitative interviews, is that there is often a degree of inaccuracy in the transcription – by the referring doctor – of the advice provided by the recipient doctor. In order to provide optimal care and protect the practitioner against future legal proceedings or professional complaints, it is advisable to make a note of the consultation and upload a copy of the images shortly thereafter to the patient file.

¹⁷³ Health Practitioner Regulation National Law 2009 (NSW) s41

Scenario 2A: Refusal to assist on the basis of hospital policy

Michael, a 56 year old man, presents to Carlton Hospital Emergency Department and is admitted at 11.30pm on a Saturday night. He recently commenced taking Allopurinol for treatment of gout, and has a medical history of moderately severe asthma, managed with inhaled corticosteroids and salbutamol. Over the last day he has developed a painful rash with low-grade fever and malaise.

Dr Young is a Resident (junior medical officer and employee of Carlton Hospital) in the Emergency Department. There are two other doctors rostered on to cover emergency, another resident, and a junior registrar (employed by Carlton Hospital). Shortly after Michael arrives, several other quite sick and unstable patients arrive in quick succession, one with a stroke, another with chest pain and a patient who has been in a serious car accident. Once the seriously unwell patients have been stabilised, Dr Young calls the dermatology registrar on call at St James Hospital about Michael. Although St James Hospital falls within the same local health district as Carlton Hospital, there is no clear arrangement between the hospitals that dermatology advice will be provided for peripheral hospitals within the network.

Dr Young: “Hi Dr Adams, I’m Dr Young from Carlton Hospital ED. I’m calling because I have a patient with a really terrible-looking rash.”

Dr Adams: “Hi Dr Young, let me stop you right there. Our dermatology team doesn’t provide on-call cover to Carlton Hospital.”

Dr Young: “But we’re in your catchment area! Can I send you a photo? I don’t know a lot about dermatology and tonight has been insanely busy. I would really appreciate any help you could offer.”

Dr Adams: “I’m sorry, but our bosses have made it really clear that we’re not indemnified to provide cover to any of the other hospitals in the region. If I’m not meant to provide advice over the phone, I certainly can’t accept photos, and definitely not by text – that’s against hospital policy. We could get fined, or fired.”

Dr Young: “If you aren’t able to provide cover, who am I meant to ask? I’m really worried about this patient.”

Dr Adams: “You’re a doctor, you’ve finished medical school. Take a history, do an exam, make an assessment. Get your supervisor to look at the patient. If they’re sick enough, transfer them to our emergency department. If they’re not, I can make an appointment for them in our clinic tomorrow. Let me know what you decide.”

As Dr Young goes to find his registrar to review Michael, the registrar is called to the wards to assist with resuscitation of a patient. Dr Young checks in on Michael who appears stable but uncomfortable. He charts paracetamol and Michael’s regular medications, including Allopurinol, which are administered prior to the morning ward round.

When Dr Young takes the morning consultant on rounds, he sees that Michael’s rash has extended and he now has erosions on his face, inside his mouth and his eyes are noticeably red. The consultant promptly diagnoses Toxic Epidermal Necrolysis (TEN)¹⁷⁴. Urgent arrangements are made for transfer.

On arrival to St James Hospital Michael is transferred immediately to ICU for supportive care. Treatment with intravenous immune globulin (IVIg) is

¹⁷⁴ Toxic epidermal necrolysis (TEN) is a potentially fatal cutaneous disorder which commences with redness of the skin and progresses to skin cell death, blistering and peeling off of skin and mucous membranes, exposing the patient to sepsis, inability to control temperature and maintain appropriate fluid levels and potentially death: Jean-Claude Roujeau Whitney A High, *Stevens-Johnson syndrome and toxic epidermal necrolysis: Management, prognosis, and long-term sequelae*, UptoDate.com, accessed 25 October 2019

commenced¹⁷⁵. Allopurinol is suspected as a causative agent, and consequently ceased¹⁷⁶. Over the following three days Michael develops a bacterial infection, and despite prompt treatment with antibiotics and optimal supportive management, he becomes septic and dies.

¹⁷⁵ There is limited evidence as to the safety or efficacy of immunosuppressive or immunomodulating therapies such as intravenous immune globulin (IVIG), cyclosporine, systemic corticosteroids or plasmapheresis. Use of these therapies is usually based upon local guidelines or clinical experience – see reference above

¹⁷⁶ Allopurinol is a medication known to be associated with Toxic Epidermal Necrolysis (TEN). Continuing to administer Allopurinol in these circumstances would likely be considered negligent, particularly as it is not an essential drug. Treatment of TEN involves admission to an appropriate unit such as ICU/burns unit/specialised dermatology unit for supportive measures (wound care, fluid management, prevention of infection – although antibiotics are not normally given prophylactically)

Scenario 2B: Failure to rescue

In this variation of scenario 2A, Dr Young knows Dr Barowski, a dermatology registrar employed at St James Hospital, from his medical school days and has her mobile number. He sends her the patient's clinical images via text message, along with a written request for assistance. Dr Barowski inadvertently glances at the photographs on her phone and notices erosions on the patient's face and eye irritation and immediately considers toxic epidermal necrolysis (TEN) likely. Does she owe a duty of care to rescue, that is, to contact Dr Young and provide an opinion that the patient requires an urgent transfer to a hospital with an ICU and dermatology? Would failure to do so constitute unsatisfactory professional conduct?

Scenario 2C: Prohibitive hospital policy

In this variation of Scenario 2A, Dr Cable is a dermatology registrar employed by St James Hospital, who is required by an agreement between the hospitals to provide dermatological cover to Carlton Hospital. Dr Cable is aware of hospital policy that no mobile phones are to be used to capture or transmit images. She refuses to review any images unless they have been taken on the hospital's digital camera (which is locked in the Nurse Unit Manager's office after-hours) and emailed through the hospital's secure network. Given the lack of access to equipment and Dr Young's workload, he isn't able to comply with these requirements and attempts to describe the rash over the phone. Dr Cable thinks the patient may have a drug eruption but from Dr Young's verbal description of the examination findings, the patient sounds stable enough to send home. The patient presents in a critical state the following day and develops sepsis and dies.

3.4 – Analysis of Scenario 2

3.4 (a) Duty of care

The imposition of a duty of care on Dr Cable in scenario 2C is clearly consistent with her existing contractual obligation to provide cover¹⁷⁷. Consideration of relevant salient features suggests that a duty of care on the part of Dr Adams (2A) is unlikely to arise, given that there is no pre-existing arrangement to provide cover to patients at Carlton Hospital (although one would certainly need to be extremely confident they were correct in such an assertion), and the absence of any assumption of responsibility or advice provided upon which the resident may place reliance.

In the case of Scenario 2B, if it can be established that Dr Barowski had seen the patient's clinical images, it is possible that a duty to rescue may arise, as recognised in *Lowns v Woods*¹⁷⁸, on the basis of her specialty training and her unique ability to recognise the existence of an emergency. Imposition of a duty to rescue is consistent with legislation providing that failure to attend to a person whom a doctor believes is in need of urgent attention will constitute "unsatisfactory professional conduct", under s139C(c) of the *Health Practitioner Regulation National Law (NSW)*¹⁷⁹ unless reasonable steps have been taken to ensure that another medical practitioner attends the person instead. This conclusion is further supported by the Medical Board of Australia's *Code of Conduct for Doctors in Australia* which states at paragraph 2.5 that:

"... good medical practice involves offering assistance in an emergency that takes account of your own safety, your skills, the availability of other options and the impact on any other patients under your care; and continuing to provide that assistance until your services are no longer required."

¹⁷⁷ Public Hospital Medical Officers (State) Award, April 2018, New South Wales, clause 11

¹⁷⁸ *Lowns v Woods* (1996) Aust Torts Reports 81-376

¹⁷⁹ Health Practitioner Regulation National Law 2009 (NSW) s 139C(c)

Under the National Law (NSW) s 41, a code approved by a national Board is admissible in proceedings as evidence of what constitutes professional conduct or practice. Paragraph 2.5 of the Medical Board's Code of Conduct could therefore support a finding of professional liability against Dr Barowski.

In *Lowns v Woods*,¹⁸⁰ a doctor was found to owe a duty of care to attend in an emergency, despite the absence of a pre-existing doctor-patient relationship. In that case Dr Lowns was in his practice when he was requested to attend a boy nearby to his practice who was suffering an extended epileptic seizure. He reportedly declined to attend, and suggested the patient be brought to his rooms or an ambulance called. The NSW Court of Appeal (Kirby P & Cole JA, Mahoney JA dissenting) relied upon the principle of proximity to establish the existence of a duty of care in the particular circumstances, as well as referring to an equivalent statutory provision and Dr Lowns' acknowledgment of his moral duty to attend. Although proximity is no longer a necessary factor in determining whether a duty exists¹⁸¹, one important consideration on the facts was that a direct request for assistance had been made, there was no reasonable impediment to Dr Lowns providing assistance, and he knew that serious harm could result if he did not come¹⁸².

There are several elements of the scenario involving Dr Barowski (2B) that render it distinguishable from *Lowns v Woods*. Physical proximity is absent (although this in itself is not a barrier to imposition of a duty), and in this hypothetical case the question is whether a specialist (or registrar) is required to provide an urgently-needed specialist opinion when a generalist doctor (here, Dr Young) is already available to attend to the patient. For a clearer example, if a trauma surgeon stopped at the scene of a car accident to find an

180 *Lowns v Woods* (1996) Aust Torts Reports 81-376 at 176

181 *Perre v Apand Pty Ltd* 198 CLR 180, 208

182 *Lowns v Woods*, n186 per Cole JA at 176

intern was already assisting a critically injured patient and decided to drive on knowing that a medical practitioner was already present, would a disciplinary tribunal consider such conduct to be unsatisfactory professional conduct?

The “other options” available to assist in the case of the emergency in Scenario 2B include relatively junior doctors who lack specialty training in the requisite area, and who face conflicting demands given their obligations to assist in emergencies arising at their own hospital. Although on the face of it our relatively junior Dr Young should be well-placed to make decisions with his supervisor’s assistance, this does not take into account the minimal dermatology teaching in medical schools in Australia¹⁸³, nor the varying experience level of supervisors rostered on overnight. If medical practitioners on-site are not in a position to recognise the emergency before them due to a lack of specialist training, they may not be in a position to “attend” to the emergency. Dr Barowski’s recognition of the emergency, by way of her specialist training, may arguably create a duty to rescue. If so, a failure to communicate the urgency and advise immediate steps in management would constitute a breach of duty.

If the recipient doctor was subject to a hospital policy which prohibits her from receiving smartphone images, it would be relevant to consider the conflicting duties upon the doctor in determining whether there is a duty of care to rescue. It is also important to consider the additional conflict with obligations to existing patients. Imposing a duty to rescue on the basis of unsolicited images may also result in an inappropriate imposition on autonomy and potential indeterminacy of liability. For example, if a doctor’s smartphone beeps with a text message in the middle of a night when they are not on-call, and thereby not obliged to check the message - and the doctor rolls over to briefly check the home screen and sees a concerning thumbnail-sized image

¹⁸³ Gupta et al, above n42

from a colleague from a hospital she previously worked at, would merely sighting the thumbnail lead to an obligation to open the message, assess the information and provide urgent advice at any hour of the night?

The Civil Liability Act provides that “*a good Samaritan does not incur any personal civil liability in respect of any act or omission done or made by the good Samaritan in an emergency when assisting a person who is apparently injured or at risk of being injured.*”¹⁸⁴ If Dr Barowski (2B) provides advice and it proves to be negligent, would she be protected for provision of that advice as a good Samaritan (presuming she is not intoxicated at the time¹⁸⁵, which, given that she is not on call, is a possibility)? The more loosely related Dr Barowski is to the patient’s care, the less likely it is that a court would impose a duty of care upon her to respond to images sent to her smartphone. This issue ought to remain theoretical, because most, if not all, practitioners are hardwired to respond to emergencies. However, given the volume and frequency of clinical image transmission combined with the many pressures placed upon medical practitioners, in combination with unrealistic hospital policies and an element of sleep deprivation, such an incident may nonetheless arise. It is worth noting in this scenario that Dr Barowski would not be expecting, nor would be offered, payment for advice provided to a colleague in an emergency such as this – rather, it would be considered a professional courtesy.

Staffing arrangements which leave the registrar and intern inexperienced and understaffed in managing a busy emergency department, and without access to dermatological opinion, may be grounds for the imposition of direct liability upon the hospital for systemic failures¹⁸⁶, in addition to vicarious liability for the actions of their employees¹⁸⁷. This is discussed further below.

¹⁸⁴ *Civil Liability Act 2002* (NSW) s. 57.

¹⁸⁵ *Ibid*, s. 58(2)(i).

¹⁸⁶ *Sherry v Australasian Conference Association* (trading as Sydney Adventist Hospital) [2006] NSWSC 75 at [463]

¹⁸⁷ *New South Wales v Lepore* [2003] HCA 4; 212 CLR 511 per Gummow J at [40]

3.4 (b) Does a failure to review available clinical images constitute a breach of duty?

Australian guidelines require doctors to ensure that an appropriate physical examination and relevant investigations take place, and to provide treatment options “*based on the best available information*”¹⁸⁸. The guidelines also require a medical practitioner to make “*responsible and effective use of the resources available,*” which involves “*upholding the patient’s right to gain access to the necessary level of health care and, whenever possible, helping them to do so*”¹⁸⁹. Evidence of such guidelines is admissible in disciplinary proceedings¹⁹⁰. Whilst the weight given to such guidelines in medical negligence is not clear, it is likely that the courts would find guidelines issued by the Medical Board of Australia to be highly authoritative, due to the degree of expertise of those involved in creating the guidelines¹⁹¹.

For all the potential failings of smartphone clinical images (including variations in lighting, colour, unrepresentative samples), a clinical image may nonetheless still be far superior to the verbal description by a doctor with limited training and experience in dermatology. A clearer example from another specialty would be a Cardiologist refusing to review an ECG for a patient presenting with chest pain, and instead requesting an intern to describe the tracing over the phone. Whilst all interns should be able to identify the tombstone-shaped markings of a STEMI (ST elevation myocardial infarction), many might miss other subtleties that indicate an infarction occurring in less common locations. To fail to incorporate the ECG into the process of diagnosis, when that information is immediately available, would likely constitute a breach of duty of care.

¹⁸⁸ Medical Board of Australia, above n 155 at 2.2.6

¹⁸⁹ Medical Board of Australia, above n 147 at 5.2.2

¹⁹⁰ Health Practitioner Regulation National Law (NSW) s41

¹⁹¹ Fiona McDonald, “The Legal System and the Legitimacy of Clinical Guidelines” (2017) 24 Journal of Law and Medicine 821-836, at 825

Whether one holds clinical images in the same esteem as an ECG tracing (which is easy to accurately capture, and any issue with the quality of tracing is ordinarily apparent) depends on the degree of faith one has in the ability of junior doctors to adequately describe dermatological findings, and their ability to capture accurate and representative clinical images. From the qualitative interviews undertaken for this thesis, it was apparent that despite the potential failings of clinical images, practitioners universally considered images far more useful and accurate than a verbal description alone, and in some cases changed the course of management on that basis (see Chapter 2).

This is not to say that clinical images ought to *replace* verbal descriptions of the patient's condition, just as an ECG tracing does not replace a discussion with the referring doctor, because that discussion is the primary source of information gleaned from the clinical history and examination. Clinical images, like ECGs, arguably constitute a critical piece of information required to *supplement* a verbal description. Making decisions without clinical images, where they are available, could arguably constitute poor medical practice.

Where does this leave employees working in a health system that prohibits capturing and sending clinical images on smartphones? If the hospital provides adequate equipment to seamlessly capture and transmit photographs, including multiple digital cameras and equipment to upload those photographs, and a secure platform which is easily accessed by the dermatology registrar or consultant, these should clearly be utilised instead. However, in reality, this is often not possible or practical. Typically only one digital camera will be supplied, and finding it after-hours in an Emergency Department can be extremely time-consuming. This is therefore not a workable solution in a time-critical specialty. In some Emergency Departments digital cameras are locked away after-hours, making compliance with a smartphone-prohibitive policy

impossible if a doctor is required to send clinical images after-hours. Consequently, doctors may be placed in the legally compromising position of having to choose whether to breach their hospital policy in order to avoid breaching their duty of care to a patient.

NSW Health Policy provides that “the use of personal smart phones (or other personal devices) by staff to capture images of patients for nonclinical purposes is generally not permitted.”¹⁹² However, NSW Health Policy does not equate to law, and no legislation strictly prohibits against sending and receiving clinical images per se. While the Privacy Act requires practitioners to “*take reasonable steps to protect patient information from misuse, interference and loss, and to protect that information from unauthorised access, modification or disclosure*”, what would be considered reasonable steps in the middle of the night in an emergency situation will not necessarily mirror the security requirements outlined in hospital or state government policy. Further, regardless of whether civil proceedings can be brought against a practitioner, disciplinary or workplace action may nonetheless be taken.

3.4 (c) Institutional liability

3.4(c)(i) Carlton Hospital

Carlton Hospital is vicariously liable for the actions and omissions of Dr Young (2C). Carlton Hospital also owes a non-delegable duty of care to the patient, who has presented to Carlton Hospital for diagnosis and management of an emergency condition, regardless of the arrangements for dermatological cover that are in place¹⁹³. Failure to provide an adequate number of staff with the

¹⁹² New South Wales Ministry of Health, *Privacy Manual for Health Information* (March 2015), s9.2.2

¹⁹³ *Ellis v Wallsend District Hospital* (1989) 17 NSWLR 553, at p 604B – p 605B, per Samuels JA, Meagher JA agreeing

expertise required to provide the services that the hospital offers, including satisfactory emergency care, may also be grounds for a finding of direct liability against the hospital. The issue of direct liability for inadequate staffing was discussed in the case of *Sherry v Australian Conference Association*¹⁹⁴.

In *Sherry* a patient died shortly after undergoing cardiac surgery under Dr Marshman. Mr Sherry began to deteriorate significantly on day 2 post-surgery, at which time he was admitted to the Intensive Care Unit (ICU) at a private hospital (the Sydney Adventist Hospital), under the care of the Intensive Care consultant (Dr Wilson) and the ICU resident (Dr Walsh, who was rostered on for 24 hours from 8am on the day in question). On day 2 post-operatively, Mr Sherry developed significant bleeding into his thorax, and subsequently died. How the signs of Mr Sherry's deterioration were interpreted, or ought to have been interpreted and acted upon, was a matter of significant contention and discussion. What is relevant to this discussion is the issue of direct liability for inadequate staffing.

In determining what would constitute adequate staffing in an ICU, the Court considered the "Guidelines for Intensive Care Units" issued in February 1997 by the Australian Council on Health Care Standards ("the ICU Staffing Guidelines"). The guidelines require that an ICU at the level provided by the Sydney Adventist Hospital must have "medical staff with an appropriate level of experience present in the unit at all times"¹⁹⁵. Dr Walsh, the ICU resident (and only doctor rostered to be on site in ICU at the time), gave evidence that remaining present in the ICU and performing his other job requirements was not possible. He reported "it was not uncommon to receive at least 10 pages an hour requesting attendance on a ward... On occasion the CMO could be called on to help out in the Accident and Emergency Department, and

¹⁹⁴ *Sherry v Australasian Conference Association* (trading as Sydney Adventist Hospital) [2006] NSWSC 75

¹⁹⁵ Australian Council on Health Care Standards, "Guidelines for Intensive Care Units", February 1997 at [2.5].

this happened frequently¹⁹⁶.”

Counsel on behalf of the hospital submitted that compliance with the ICU Staffing Guidelines was not mandatory, and adduced evidence that the guidelines were not universally followed by other hospitals. These arguments were rejected by the court:

“While I accept that departure from the Minimum Standards or Guidelines does not necessarily entail a conclusion that the standard of care provided was inadequate, that conclusion cannot be escaped merely on the basis of evidence that other hospitals operated at a standard the same as or similar to that of SAH. The judgment has to be that of the court based upon the evidence of what constitutes an acceptable level of care... The question is to be determined by reference to the degree of departure from the Guidelines, an assessment of the workload of Dr Walsh, and its impact upon his capacity adequately to service ICU patients”¹⁹⁷.

Causation was established between the inadequate staffing and the failure to detect the deterioration of Mr Sherry and his consequent death, and Sydney Adventist Hospital was found directly liable in this regard.

In the case of scenario 2A, Carlton Hospital’s failure to provide adequate staffing at the Emergency Department level and a failure to have arrangements in place for expert dermatological advice may be grounds for a finding of direct liability. The case of *Sherry* also highlights the weight that guidelines may have, even if a substantial proportion of the medical community ignores them.

A finding of direct liability may also be imposed on the basis of a failure to provide adequate equipment to comply with hospital policy whilst simultaneously prohibiting smartphone use, if clinical images are consequently

¹⁹⁶ *Sherry v Australasian Conference Association* at [445].

¹⁹⁷ *Ibid* at [462].

not provided for this reason. Given that a number of purpose-built applications have existed for several years that enable secure capture and transmission of images, as well as integration with the clinical record, the failure to provide access to workable solutions like this is likely to be considered unacceptable.

Purpose-built secure messaging software subscriptions are unlikely to be so costly as to trigger a defence under s42 of the *Civil Liability Act*. This section outlines principles for consideration in determining whether a public or other authority has breached a duty of care, which includes acknowledgement that *“the functions required to be exercised by the authority are limited by the financial and other resources that are reasonably available to the authority for the purpose of exercising those functions.”* The costs of such app subscriptions may change if various apps are widely adopted and the market allows them to increase their prices, although this is likely to be kept in check by the considerable competition provided by both small start-ups (at least 5 groups have developed apps in Australia at the time of writing), and the efforts of larger vendors such as Epic and Cerner to provide applications. However, another approach to s42 may be to argue that instituting a hospital, local health district or statewide approach is so significantly complex that the hospital is limited by the financial resources required in terms of staff and working hours reasonably available to the hospital. The costs of storage of data and the cost of transferring data may also be factors in determining whether such a defence could be sustained.

Scenario 2C would be more complex if the hospital had endeavoured to implement a technological solution, and the solution was so unworkable or time-consuming to use that doctors either elected not to send photographs, or sent them using an unauthorised format. These issues, and potential technological solutions, will be discussed in greater detail in Chapter 4.

3.4(c)(ii) St James Hospital

In Scenario 2A, there is no arrangement between St James Hospital and Carlton Hospital, and so no duty of care is likely to arise on behalf of St James Hospital. In Scenario 2B, likewise there is no prior arrangement between the two hospitals, and the consultation has arguably not occurred within the scope of Dr Cable's employment, so St James would not be vicariously liable for her acts or omissions. A non-delegable duty would be unlikely to arise in these circumstances as neither the patient nor Dr Young have approached Dr Barowski specifically as an employee of St James Hospital. This may be different if Dr Barowski was actually on call for St James Hospital and/or Carlton Hospital at the time, and Dr Young was aware of this and seeking a formal consultation rather than an informal opinion.

In Scenario 2C, St James has undertaken to provide dermatological services to Carlton Hospital, and so is vicariously liable for the actions of Dr Cable, and perhaps directly liable for the failure to ensure that staff at St James have the resources to safely and confidentially carry out the provision of the agreed services. Arguably the patient has not approached St James Hospital for dermatological care, and a non-delegable duty is unlikely to arise until the patient is transferred to St James Hospital.

As Carlton Hospital and St James Hospital are part of the same local health district, the local health district will owe a non-delegable duty of care, and apportionment of liability between the two hospitals becomes less relevant. Where the contracted service is a separate entity, this issue may have greater importance.

Scenario 3A: Study group

Mrs Smith presents to clinic in a public hospital for a full skin examination. She is a 55 year old woman who has grown up on the Gold Coast and whose skin exhibits signs of extensive sun damage, with multiple lesions requiring review. She has no family or personal history of melanoma and has no significant medical history.

Dr Jones, a final year dermatology registrar, conducts a full skin examination and identifies several lesions of concern amongst the sea of pre-cancerous changes. The consultant allocated to the clinic, Dr Amaro, a Visiting Medical Officer, is assisting a resident medical officer with his first excisional biopsy in the procedure room and has several other patients awaiting review, so reports that it is likely to be some time before he can see Dr Jones' patient. Dr Amaro requests to see images of lesions of concern because any management plans need to be signed off by him.

Dr Jones takes photographs of 4 lesions of concern on her smartphone, 2 pink macules and 2 pigmented lesions, of which she includes a dermoscopic image. She obtains verbal consent from Mrs Smith to take the images to show to her consultant, and documents this in the notes. Dr Jones returns to the procedure room, waits for an opportune moment and holds the smartphone in Dr Amaro's field of vision, reporting her diagnosis and treatment plan for each lesion; "superficial BCC¹⁹⁸, cryotherapy; dysplastic nevus, monitor; another superficial BCC, cryotherapy; and this one is quite suspicious for melanoma, it needs excision." Dr

¹⁹⁸ Basal cell carcinoma (BCC) is very common in Australia, and very rarely metastasizes. Superficial BCC may be treated through a number of modalities. Excision (as opposed to cryotherapy, which involves destruction of the lesion by freezing the area with liquid nitrogen) is not without (usually minor) complications, and is associated with higher costs.

Amaro agrees with her and advises her to go ahead with her planned treatment. He does not attend Mrs Smith in person or conduct a full skin examination himself.

Several months later Dr Jones and her study group make an arrangement to go through the clinical images on their phones and share them via a Whatsapp messaging group so that members of the study group can examine their diagnostic skills. Dr Jones uploads Mrs Smith's images, amongst others, and 4 out of 5 of the other registrars come to the same conclusions, but one registrar, Dr Farley, comments that one of the lesions diagnosed as a BCC has some features which could make it suspicious for amelanotic melanoma. As the lesion was treated with cryotherapy, it was destroyed, and no tissue sample was sent to pathology. Dr Jones' mind is racing – missing an amelanotic melanoma features in the nightmares of every dermatologist and GP. She looks back through her clinic notes the next day, which state:

“Full skin examination performed, extensive photodamage. Four lesions of concern - 2x BCC (left upper arm, right lower leg), 1 x dysplastic naevus for monitoring (right shoulder) and 1 for excision (left forearm).”

She types additional information into that visit in the medical record:

“2x superficial BCC – clinical images reviewed by Dr Amaro prior to cryotherapy, no macroscopic or dermoscopic features of amelanotic melanoma present.”

When the patient returns in 6 months, the lesion has recurred on her forearm and now displays several concerning features. The lesion is excised and is indeed an amelanotic melanoma, and is invasive.

By the time the patient has returned for review, Dr Jones has passed her exams, left the study group on Whatsapp and deleted patient photos off her phone. She did not upload the photographs to the medical record prior to deletion.

Mrs Smith brings a claim in negligence against Dr Jones, Dr Amaro and the hospital.

Scenario 3B: What lurks in the periphery

In this variation on scenario 3A, the registrar Dr Jones correctly diagnosed the 4 main lesions of concern. However, one of the clinical images captured by Dr Jones features a superficial BCC in its centre, and a small melanoma at the lower right periphery of the image. Her supervisor, Dr Barry, a Visiting Medical Officer, is focussed on the lesion in the centre of the image and also misses the melanoma.

The images are uploaded to the system during the consult and Dr Jones writes thorough notes. When the patient returns for review in 6 months, the melanoma has increased in size and nodularity and is now invasive.

Duty of care

A duty of care clearly arises on the part of each of the employee doctors in this scenario. The hospital is vicariously liable for the doctors in question and also owes a non-delegable duty of care. The key issues of interest in these scenarios relate to breach of duty.

3.5 – Analysis of Scenario 3

3.5 (a) Breach of duty

Dr Amaro

In an outpatient clinic setting, patients are ordinarily allocated to a clinic list under the name of one, or several, consultants. Although initial patient review is often conducted by a junior doctor, the consultant retains the responsibility to adequately supervise that junior doctor. What constitutes adequate supervision is not strictly defined, nor would a strict definition be workable in practice, although a number of policy documents address the requirement for adequate supervision in general terms¹⁹⁹. This allows for variations in the level of supervision required having regard to the competency, experience and confidence level of the junior doctor in question. In practice, the manner in which supervision is provided may also vary depending on the consultant, and the relationship and degree of trust between the supervisor and the junior doctor. In some cases consultants will conduct the entire patient review again, while others may revisit aspects of the patient history and conduct their own examination. Other consultants may rely more heavily upon the findings of the junior doctor and provide advice on management, assuming the registrar's findings are correct.

A junior doctor is likely to be held to the standard of a qualified doctor²⁰⁰, although junior doctors, their supervisors and employers may be responsible for requiring junior doctors to work at a level of skill which is beyond their scope²⁰¹. For the

¹⁹⁹ See, for example Postgraduate Medical Council of Victoria Inc., '*Supervision of Junior Doctors Guidelines*' (2017) <<https://www.pmcv.com.au/computer-matching-service/resources/909-supervision-of-junior-doctors-guidelines/file>>

²⁰⁰ *Wilsher v Essex Area Health Authority* [1988] 1 AC 1074

²⁰¹ *Brus v Australian Capital Territory* [2007] ACTSC 83

purposes of liability this point is somewhat academic, as registrars work in the public system setting, and the healthcare institute training them would be vicariously liable for the actions of both the junior and supervising doctor. However for the purposes of disciplinary proceedings, a junior doctor would be expected to evaluate whether particular actions are beyond the scope of their role or experience²⁰². In this case, Dr Jones is a final year registrar who would, pending passing her examinations, soon be qualified as a dermatologist to practice independently. An ability to accurately diagnose skin cancers would be within the expected scope of her role and responsibility.

Whether Dr Amaro is considered negligent in reviewing the images by smartphone rather than reviewing the patient in person will depend on whether Dr Amaro would ordinarily be required to personally review this patient with the registrar. In this situation, given that cancerous and pre-cancerous lesions are being reviewed (as compared to, for example, an eczematous reaction which will either respond to treatment or be reviewed again shortly to determine the outcome of proposed treatment), and given the minimal time required to review the lesion prior to destruction of the specimen through cryotherapy, it is likely that face-to-face review would be considered appropriate. If the patient declined to wait for Dr Amaro to attend in person, and this was properly documented, a smartphone review might be the only feasible way to provide supervision, and preferable to no supervision at all.

²⁰² See Medical Board of Australia, "Good Medical Practice: A Code of Conduct for Doctors in Australia" (March 2014) at [2.2.1].

3.5 (b) Is a defence available under section 50 of the Civil Liability Act?

Section 50 of the Civil Liability Act, titled “Standard of care for Professionals,” modifies the common law as follows:

*(1) A person practising a profession ("a professional") does not incur a liability in negligence arising from the provision of a professional service if it is established that the professional acted in a manner that (at the time the service was provided) was **widely accepted in Australia by peer professional opinion as competent professional practice.***

*(2) However, peer professional opinion cannot be relied on for the purposes of this section if the court considers that the opinion is **irrational.***

(3) The fact that there are differing peer professional opinions widely accepted in Australia concerning a matter does not prevent any one or more (or all) of those opinions being relied on for the purposes of this section.

(4) Peer professional opinion does not have to be universally accepted to be considered widely accepted.”

Arguably the conduct of a consultation via teledermatology (smartphone or otherwise) constitutes the “provision of a professional service”. Although reviewing patient images via smartphone is *widely practiced* (see Chapter 2), it is unclear whether prevalence alone would be sufficient for smartphone review of clinical images to be considered a “widely *accepted* practice”. The application of s 50 has, over time, become somewhat tortured. A discussion of the key authorities relating to s 50 is provided as context to the development of recent ambiguities.

In *Dobler v Halverson*²⁰³, Giles JA (with Ipp and Basten JJA agreeing) held that s50 essentially provides a defence, whereby if the defendant can prove that their conduct accorded with professional practice “*regarded as acceptable by some (more fully, if he “acted in a manner that ... was widely accepted ... by peer professional opinion as competent professional practice”*), then subject to rationality that professional practice sets the standard of care.”

The interpretation of the term “practice” was significantly narrowed by Macfarlan J in *McKenna v Hunter & New England Local Health District*²⁰⁴. Macfarlan J stated that “to establish a defence under s 50 a medical practitioner needs to demonstrate, first, that what he or she did conformed with a *practice* that was in existence at the time the medical service was provided and, secondly, to establish that that *practice* was widely, although not necessarily universally, accepted by peer professional opinion as competent professional *practice*”²⁰⁵ (Original emphasis).

The effect of this narrowing of the definition of practice is that practitioners must be able to identify a specific process, pattern or protocol in response to a clinical scenario, compared to the *Dobler* approach of establishing that the doctor’s conduct in the circumstances of the case constituted “competent professional practice”. The significance of this is that in unusual cases, there may be no specific identifiable practice or pattern that can be established for the purposes of s 50.²⁰⁶

The question as to how s 50 ought to properly be interpreted was recently revisited in conflicting judgments in *Sparks v Hobson*²⁰⁷. Both Simpson JA and

²⁰³ *Dobler v Kenneth Halverson and Ors* [2007] NSWCA 335 at [59]

²⁰⁴ *McKenna v Hunter & New England Local Health District* [2013] NSWCA 476

²⁰⁵ *Ibid* at [160]

²⁰⁶ R. S. Magnusson, 'Sparks v Hobson must go to the High Court: here's why' <<https://sydneyhealthlaw.com/2018/05/09/sparks-v-hobson-must-go-to-the-high-court-heres-why/comment-page-1/>>

²⁰⁷ *Sparks v Hobson; Gray v Hobson* [2018] NSWCA 29

Basten JA considered the interpretation of s 50 in *McKenna* to be an overly restrictive approach. However, Simpson JA considered that she was bound by the judgment in *McKenna*²⁰⁸, whilst Basten JA did not consider the judgment binding as the judgment had been overturned in the High Court, albeit on a separate question²⁰⁹. Macfarlane JA reiterated his position in *McKenna*²¹⁰. Leave to appeal was refused in the High Court on 14 September 2018²¹¹. At this stage it would appear that a specific “practice” must still be identified in order to rely on s 50, although this is almost certainly a point that will receive further judicial consideration in the future. In any event, depending on the specific circumstances of the case, it is arguable that providing advice via smartphone consultations is capable of constituting a sufficiently specific practice to satisfy the *McKenna* interpretation of s 50.

3.5 (c) Is a widely utilised practice necessarily a widely accepted “practice”?

Informal mobile teledermatology is certainly widely utilised as established in Chapter 2, if somewhat sheepishly, given risks to patient privacy and often in direct contravention of workplace policy. It is a matter for evidence from the defendant’s expert witnesses to establish whether there is a professional practice widely accepted by (rational) peer professional opinion. The defendant bears the onus of establishing the elements of s50(1) as held in *Dobler v Halverson*²¹² and *South Western Sydney Local Health District v Gould*²¹³.

²⁰⁸ Ibid at [336]

²⁰⁹ Ibid at [35]

²¹⁰ Ibid at [221]

²¹¹ *Sparks v Hobson* [2018] HCATrans 191 (14 September 2018)

²¹² *Dobler v Halverson* (2007) 70 NSWLR 151 at [60] - [61]

²¹³ *South Western Sydney Local Health District v Gould* [2018] NSWCA 69 (13 April 2018) at [30]

In *Dobler v Halverson*²¹⁴, Giles JA gave some guidance on the approach to competing evidence from expert witnesses engaged by the plaintiff and the defendant as to whether a practice is widely accepted:

“If [the expert witness’s] view is supported by the relevant medical literature, wide acceptance may be established, although it may be necessary to allow some degree of latitude for errors of judgment not amounting to breach of the standard of care.... On the other hand, if Dr B states that the defendant acted in a manner the doctor regards as within competent professional practice the doctor may need to go further in order to establish that the lower standard is widely accepted in Australia...”

In these circumstances, for the court to “prefer” the evidence of Dr A to that of Dr B may mean no more than that the former has established an appropriate standard and that the latter, while demonstrating the doctor’s own belief that the departure from the proposed standard is acceptable, has not satisfied the court that the approach is widely accepted”²¹⁵.

The experts engaged on behalf of the defendants would need to establish that the approach of providing smartphone teledermatological opinion was a specific practice that was widely accepted at the time in response to the clinical scenario at hand. Given the extent and ubiquity of the practice, this is not likely to be overly challenging. There is a growing body of medical literature indicating that mobile telemedicine is acceptable to both physicians and patients, at least for some categories of use, such as triage and monitoring of chronic conditions. However, this may not apply to the specific practice of reviewing images of patients who have presented to clinic for dermatological care and instead receive a remote review.

²¹⁴*Dobler v Halverson* (n203), [103] – [104], Giles JA with Basten JA & Ipp JA agreeing

²¹⁵ *Ibid* at [160].

Even if the defendant's expert witness is able to establish that smartphone teledermatology review was a widely accepted practice at the relevant time, that view may yet be rejected as "irrational" by the court. Whilst the wording differs across equivalent provisions in each of the states in Australia, in New South Wales, a finding that the widely accepted practice is irrational would be exceptional. This is because, as noted by Justice Leeming in *South Western Sydney Local Health District v Gould*:

*"Text, context and purpose all support the conclusion that it is a seriously pejorative and exceptional thing to find that a professional person has expressed an opinion that is 'irrational' and even more exceptional if the opinion be widely held. To consider a body of opinion to be 'irrational' is a stronger conclusion than merely disagreeing with it, or preferring a competing body of peer professional opinion"*²¹⁶.

Accordingly once a widely accepted practice has been shown to exist, the defence is highly unlikely to be discarded on the grounds of irrationality.

3.5 (d) How is the standard of care determined when section 50 is pleaded?

Section 5B of the Civil Liability Act sets out circumstances where liability will not arise, adopting factors identified by Mason J in *Wyong Shire Council v Shirt*. No liability will arise unless the risk of harm was foreseeable, and not insignificant. Section 5B(2) outlines factors relevant to determining what precautions a reasonable person would take in response to the risk of harm, including the probability of harm, the likely seriousness of that harm, the burden of taking precautions and the social utility of the activity creating the risk of harm. The

²¹⁶ *South Western Sydney Local Health District v Gould* at [96]

question to be determined is what a reasonable person would do in response to the foresight of the risk of the risk of the injury the plaintiff suffered²¹⁷.

The relationship between ss5B and 5O of the Civil Liability Act in determining the standard of care to be applied has been the subject of recent judicial consideration. In *Sparks v Hobson*²¹⁸, Basten JA was of the opinion that where s 5O can be satisfied, *“it will fix the relevant standard; there cannot be two legally supportable standards operating in one case,”* whilst Simpson JA suggested that *“s 5O, like s5I, provides a complete answer to a claim under Pt 1A of the CLA. It is in that sense that the section operates as a defence. For that reason, when it is pleaded, it is convenient to deal with it first.”* Leeming JA supported this approach in *Gould* on the grounds that *“there is no reason to add to the complexity of trials, so as to require the evaluation of the professional’s conduct against not one but two separate standards”* nor to risk the *“potential reputational damage which may be suffered by a finding of breach of the test at common law to be incurred when, if s 5O applies, statute has said that the professional does not incur a liability in negligence”*²¹⁹.

3.5 (e) Is there a duty to warn patients of the limitations of teledermatology?

The duty of care owed by the referring doctor, and perhaps also the recipient doctor, extends beyond diagnosis and treatment to include informing patients of the risks of associated with any proposed treatment or management. Informed consent is required prior to all forms of medical treatment. Consent is, *“in reality, meaningless unless it is*

²¹⁷ *RTA v Dederer* [2007] HCA 42 per Gummow J [353]

²¹⁸ *Sparks v Hobson* at [24]

²¹⁹ *Gould v South Western Sydney Local Health District* at [127]

*made on the basis of relevant information and advice*²²⁰.” A risk is “material” if in the circumstances of the particular case, a reasonable person in the patient's position, if warned of the risk, would be likely to attach significance to it, or if the medical practitioner is or should reasonably be aware that the particular patient, if warned of the risk, would be likely to attach significance to it.²²¹ The relevant factors as set out above are not significantly varied by s 5B of the *Civil Liability Act*²²².

Many of the risks associated with teledermatology arise from the inability to physically review the patient. These risks may be overcome by a thorough referrer and recipient who communicate effectively and seek out further information where required, and despite the perceived risks, the diagnosis and treatment plan achieved through consultation with a specialist dermatologist would ordinarily be more accurate than that of a non-dermatologically trained doctor working without remote specialist advice. However the choice of whether to have an immediate smartphone review or a delayed face-to-face review is arguably for the patient to make, as long as the patient receives appropriate information regarding the risks and benefits of teleconsultation as compared to face-to-face consultation, so that an informed choice may be made.

For a patient in rural or remote Australia who faces difficulty accessing dermatological opinion, the benefits of immediate dermatological advice and treatment may easily outweigh the risks of a missed diagnosis. In the case of Mrs Smith, this information may change her decision as to whether to wait an additional 30 minutes to receive face-to-face review by a senior specialist dermatologist, rather than opting for images of her lesions to be reviewed.

²²⁰ *Rogers v Whitaker* at [14].

²²¹ *Ibid.* at [16]

²²² See *Jambrović v Day* [2017] NSWSC 1468 where the court applied both the test in *Rogers v Whitaker* and s 5B of the *Civil Liability Act*.

3.5 (f) Failure to upload images

The failure to upload the images to the clinical record is a breach of statutory duty²²³ and potentially of relevant codes of conduct²²⁴. Clinical photographs form part of the medical record, and medical practitioners are obliged to retain clinical records for at least 7 years under NSW legislation. Doctors are also required to maintain clear and accurate medical records under paragraph 8.4 of the *Code of Conduct for Doctors in Australia*, and under the Guidelines for Technology-Based Consultations.

There is likely also an obligation upon the hospital and Dr Amaro (3A) to institute a system to ensure images are uploaded promptly to the patient record, just as there is a responsibility to institute a system to record and review pathology and histology results. Storage of images on personal devices (and their subsequent deletion without upload to the file) is likely to be viewed critically by the court, and the public, as occurred in the *Inquest into the death of Virginia (Kumanytjayi) Nabarula Brown*²²⁵. This case involved the death of a 46 year old woman who was being held in the Central Australian Aboriginal Alcohol Programmes Unit against her will. At the time of her death a visiting doctor would attend the facility twice a week, and would be notified of which patients required medical review by the permanent staff of the unit either verbally or via other informal methods. Several important interactions between staff and the patient were not documented in the progress notes. The Coroner was critical of the failure to document medical reviews in the patient file, noting that:

²²³ Health Records and Information Privacy Act (NSW) 2002 No 71, s25

²²⁴ Medical Board of Australia, above n 147, paragraph 8.4.1

²²⁵ Inquest into the death of Virginia (Kumanytjayi) Nabarula Brown [2015] NTMC

“A review of a patient, and follow up of their care, should not be left to ‘notes in a book’ or someone’s ‘smartphone’. They should be recorded in a system that enables checks to take place and also ensures that should something change in terms of a patient’s care then the next professional that is brought in can quickly assess that patient and ensure that the previous plans and reviews in fact occur”²²⁶.

A failure to properly document the medical review is also likely to lead to more protracted legal proceedings, should a claim be made, as occurred in the case of *Coote v Kelley*.²²⁷ In this case, the appearance of an amelanotic melanoma on the sole of the foot was treated as a plantar wart for 18 months by a GP (and on occasion by his colleagues during this period), with very brief clinical notes. The conflicting testimonies of the defendant and plaintiff were revisited in a Supreme Court hearing, an appeal, a re-hearing, and further appeal to the Court of Appeal.²²⁸ A significant amount of time, stress and expenditure could have been avoided had an accurate photograph of the initial lesion been captured and uploaded. While the inclusion of clinical images may sometimes not be to the direct benefit of the medical practitioner in medicolegal proceedings, it does allow quick settlement of cases where negligence is demonstrated, minimising legal costs for insurers and decreasing protracted stress to the practitioner by allowing early settlement in appropriate cases. Further, photographs will enable improved clinical management by enabling comparison of pigmented and other lesions from one visit to the next if appropriate, and may be subsequently reviewed or audited by other dermatologists. This allows for improvement of patient care and more generally, the quality of clinical services, which has the potential to decrease the amount of medical errors that give rise to medicolegal proceedings.

²²⁶ Ibid at at [114].

²²⁷ *Coote v Kelly; Northam v Kelly* [2016] NSWSC 1447.

²²⁸ *Coote v Kelly* [2013] NSWCA 357 , *Coote v Kelly; Northam v Kelly* [2016] NSWSC 1447 , *Coote v Kelly; Northam v Kelly* [2017] NSWCA 192.

3.5 (g) Failure to provide adequate follow-up

A failure to correctly diagnose the amelanotic lesion at the first instance in scenario 3A may not be sufficient to constitute a breach of duty of care in these circumstances. However, Dr Jones' subsequent alteration of the medical file, for reasons of self-protection rather than patient care and may have materially contributed to the potential for metastasis given the consequent delay in review, fall short of the standard of care required of a dermatology registrar, and expose her to disciplinary action. At the point in time where Dr Farley mentioned the possibility of an amelanotic melanoma, the minimum required to discharge her duty of care to the patient would be to review the clinical images with Dr Amaro to determine whether any concerning features were in fact present. If such features were present, the patient ought to have been recalled, reviewed and managed appropriately (including surgical excision with appropriate margins)²²⁹.

3.5 (h) Altering medical records in an age of electronic audit trails

Metadata (that is, data about data) is automatically generated when electronic health records are used and recorded in an audit log. This data includes the time and date of entry or alteration of records, the user who has made these changes, and whether data has been revised, deleted or printed. Although this is not an intrinsic part of the medical record, it may be requested in the course of proceedings, and plaintiff lawyers (at least in the United States) are increasingly recognising the value of such audit trails²³⁰. The

²²⁹ See *O'Shea v Sullivan* (1994) Aust Torts Reports 81-271; *Finch v Rogers* [2004] NSWSC 39 and *Thomsen v Davison* [1975] QLD R 93

²³⁰ Jennifer A. W. Rush, 'Health Record Audit Trails: How Useful is the Metadata that is Associated with a Patient's Health Record?' <<https://www.nhdlaw.com/health-record-audit-trails-useful-metadata-associated-patients-health-record/>>. Date accessed: 25 October 2019.

format and content of audit trails differ between electronic health record software systems, in that some systems will include the content of information altered or deleted, and others will only indicate that changes were made. Whilst Dr Jones may have amended the record to provide further clarification of the examination findings, the fact of subsequent access to the record and alteration of her notes may cast doubt upon her intentions, and her credit as a witness in the same way as subsequent alteration of paper records²³¹.

3.5 (i) Deletion of the clinical images

Deletion of clinical images from a device should only be performed once the images have been transferred to another location, preferably the patient's electronic medical record. The deletion of the photograph in this case is at the very least a breach of statutory obligation²³², as discussed above, and potentially constitutes unprofessional conduct. At worst, deletion of the photographs and/or alteration of the medical record may constitute a crime which carries a maximum sentence of 10 years imprisonment under s 317 of the *Crimes Act* 1900 (NSW). Establishing there was intent to tamper with evidence beyond a reasonable doubt may prove difficult, however the fact of alteration and/or deletion is likely to impact upon the doctor's credibility.

3.5 (j) Can deleted smartphone images and messages from the study group be subpoenaed?

Although deleting messages and images from smartphones may seem a simple process, those messages are rarely unrecoverable. Whilst deleted from sight, they often remain stored on the phone in a format invisible to the text messaging or

²³¹ See *BT v Oei* [1999] NSWSC 1082

²³² Health Records and Information Privacy Act 2002 (NSW) No 71

camera roll app. It may be retrievable through cloud storage back-ups of smartphone data, or through the use of third-party software. An inability to respond to a subpoena requesting smartphone images or text messages on the basis that the data has been deleted from the device will not necessarily be accepted by courts. In the Victorian Supreme Court case of *Hanks v Johnston*²³³, a defendant in a defamation case reported he was not able to provide copies of text messages sent from his phone as he routinely deleted his messages every 30 days. The plaintiff argued that this data could be extracted either from an iCloud backup or by using third party software such as the 'Wondershare Dr. Fone' software. The court made an order that the defendant was to use the specified software and search his iCloud account for any available backup of the text messages sought.

It is not likely that the plaintiffs' lawyers would necessarily be aware that images were sent to other members of the study group, however they may suspect such behaviour based upon known patterns of clinical image use. Discovery of images transmitted to other clinicians will become more commonplace over time as regular capture and transmission of images is recognised as a common practice by plaintiff lawyers. The recipients of those images may be determined through the use of interrogatories from the defendant practitioner under regulation 22.1 of the *Uniform Civil Procedure Rules 2005* (NSW) (the "UCPR"). Those images could then be made subject to an order for discovery from a third party under regulation 5.4 of the UCPR.

3.5 (k) Is consent required for use of clinical images for educational purposes?

²³³ *Hanks v Johnston (No 3)* [2016] VSC 629 (21 October 2016)

Patient images may be used for teaching if the patient consents, or if Health Privacy Principle 5(e) set out in Schedule 1 of the *Health Records and Information Privacy Act NSW*,²³⁴ is satisfied. This clause allows the use of images for teaching if:

*“(e) the use of the information for the secondary purpose is **reasonably necessary** for the training of employees of the organisation or persons working with the organisation and:*

(i) either:

(A) that purpose cannot be served by the use of information that does not identify the individual or from which the individual's identity cannot reasonably be ascertained and it is impracticable for the organisation to seek the consent of the individual for the use, or

(B) reasonable steps are taken to de-identify the information.”

Whether a spot-diagnosis quiz run by fellow registrars is considered “reasonably necessary” for the training of employees is debatable, however the information is easily de-identifiable, as long as there are no identifying tattoos within the image or metadata attached to the image which would incidentally identify the patient.

3.5 (I) Failure to identify peripheral lesions

Liability would be straightforward in scenario 3B where a lesion was present and captured in an image, however was not recognised due to the framing of the image. This case would likely be settled out of court. Such errors can, and do,

²³⁴ *Health Records and Information Privacy Act 2002* (NSW) No 71 (n Schedule 1, Privacy Principle 5(e))

occur²³⁵. Framing is important for directing our attention to findings of relevance²³⁶, both in traditional and clinical photography. This image likely was framed in this manner because the registrar failed to identify the small melanoma as a malignancy.

Recipients of images should recognise that there is value in taking a systematic approach to image evaluation. All medical students are taught how to interpret a basic chest x-ray in medical school with a simple mnemonic, DRS ABCDE²³⁷, standing for **D**etails (identify the patient, their age and gender, the type of film and the date and time of study), how **R**ipe is the image, that is – what is the technical quality of the film (includes assessing rotation, inspiration, picture quality and exposure of the film), and so on. No such education is currently available to medical students, registrars or dermatologists regarding clinical photography interpretation, perhaps because the interpretation of clinical images is assumed to be relatively straightforward. However, the application of a systematic approach would assist in minimising these types of errors, and may prompt those capturing the initial image to be mindful of the manner in which they photograph.

Although there is more variation in clinical dermatology images as compared to a chest x-ray, it would be useful to teach a consistent approach in medical school and reinforce these considerations throughout college training. A basic approach could similarly involve an acronym. For example, ABCDE:

²³⁵ Private communications between the author and an Australian medical defence insurer's lawyer in May 2015: examples were given where x-rays were wrongly interpreted as unremarkable because fractures were placed in the periphery of photographs or accidentally entirely cropped out of photographs sent to supervisors.

²³⁶ Keng Chen, Adrian Lim and Stephen Shumack, 'Teledermatology: influence of zoning and education on a clinician's ability to observe peripheral lesions' (2002) 43(3) *The Australasian Journal of Dermatology* 171-174

²³⁷ Dr Fraser Brims, 'DRSABCDE of CXR Interpretation', *Life in the Fast Lane* <<https://litfl.com/drsabcde-of-cxr-interpretation/>>

- *Assess appropriateness of conducting assessment based on clinical images*
- *Background: assess lighting, angles (to check for edema/elevation), assess framing, and whether a series of local and generalised photographs is required*
- *Colour, Correlation, Context and Communication- be aware that this may appear differently on various displays – any discrepancies or concerns should be raised with the referrer and put into context alongside the provided clinical history*
- *Documentation – note number of photos reviewed (incomplete loading of a series of images may be an issue in areas with slow wifi connections), upload photos and advice provided to patient record*
- *Edges – check the peripheries for additional lesions of concern, lymphangitis, etc.*

Such an approach would be beneficial to introduce at the medical school level, as clinical images are likely to be used by doctors in a variety of specialties and for different purposes throughout their training and professional careers.

3.6 Conclusions

Smartphone consultations with clinical images provide critical clinical information which may influence the diagnosis and management of patients, particularly for those who do not otherwise have immediate access to specialist dermatological opinion. Making decisions on the basis of verbal descriptions alone without the aid of clinical images, where they are available, would arguably not constitute good medical practice.

However, the current methods of capture, transmission and documentation pose a number of medicolegal risks.

A duty of care may well arise in the context of a smartphone consult, however each case will turn on its own facts²³⁸. If there is a duty of care, the main ways in which it is likely to be breached include misdiagnosis, failure to obtain sufficient information from the referring doctor, lack of proper documentation leading to improper treatment, and failure to ensure ongoing care for patients with potentially serious conditions²³⁹. If accurate advice cannot be provided via telehealth, the patient should be referred for review by another modality where possible. If this is not otherwise possible, the limitations of the consultation should be noted, as this will be of relevance in determining whether the duty of care has been fulfilled in the circumstances.

The risk of misdiagnosis is increased if the receiving doctor is unable to examine the patient in person and find clinical signs that may not be evident to the referring doctor. If the signs are not evident to the referring doctor, they may not be captured in a photograph, or perhaps may be incidentally captured but framed in a way that does not draw the attention of the recipient, as highlighted in Scenario 3B. Accordingly, if a recipient doctor has a reasonable opportunity to review the patient in person, this should be done in place of a smartphone consult.

Where in-person review is not reasonably possible (for example, a consultation is being made regarding a patient at a peripheral hospital), several steps to mitigate risk are recommended. Firstly, doctors need to be made aware of the potential failings of smartphone clinical images, including: whether all images have been received, and whether a representative sample of the eruption has been provided, the potential for

²³⁸ *Wyong Shire Council v Shirt* (1980) 146 CLR 40

²³⁹ *Thomsen v Davison* [1975] QLD R 93 at p95; *O'Shea v Sullivan* (1994) Aust Torts Reports 81-271; *Finch v Rogers* [2004] NSWSC 39

inaccurate perception of colour due to poor lighting, and whether the framing has drawn attention away from important findings in the periphery. It would be appropriate for medical schools, hospitals and colleges to promote a systematic approach both to clinical image capture, and to clinical image interpretation, as suggested above²⁴⁰. This may be facilitated, and enforced, by the Australian Medical Council (“AMC”), which sets standards for medical school and speciality training programs and is responsible for accrediting such programs. The AMC has recently declared one of its 5 strategic goals over the coming decade to be “[using] accreditation standards and procedures to encourage medical education and training that is consistent with how technology and artificial intelligence could affect the future delivery of medical care²⁴¹.” Each provider of medical education will nonetheless have responsibilities to ensure they include appropriate education to satisfy the AMC’s requirements.

Further, a systematic approach to excluding potentially serious presentations by asking about the presence or absence of ‘red flags’ would be prudent for each consultation. This may be done either verbally when receiving the consult, or placed in a template used for the consultation process, as suggested above. Awareness of systemic illness, immunosuppression, multi organ dysfunction, mucosal lesions or the presence of a non-blanching rash should trigger more urgent in-person dermatological review.

Documentation is an important issue both for patient care and also as evidence in potential medicolegal proceedings. It is not clear whether the referring doctor, recipient doctor, or both, are responsible for ensuring that clinical images are added to the patient record. Either way, recipient doctors cannot assume that this is being done by the referring doctor unless otherwise agreed. It is worthwhile from both a professional perspective, and as protection in the course of medicolegal proceedings, that a note of

²⁴⁰ The author was involved in drafting practice guidelines on behalf of the Australasian College of Dermatologists’ e-Health Committee: Lisa Abbott at n 20

²⁴¹ Australian Medical Council, “Strategic Plan 2018 – 2028” (2018), <https://www.amc.org.au/about/strategic-plan-2018-2028/>

the consultation and a copy of the images be recorded, and uploaded shortly thereafter to the patient file. Ideally this should take place through efficient software that allows secure transmission and direct integration of images to the electronic medical file (discussed in chapter 4). Failure to provide adequate software to transmit clinical images for patients so that patients in peripheral hospitals can access prompt specialist opinion may well give rise to direct liability on the part of the hospital (given that a number of purpose-built applications have existed for several years).

The fact that smartphone consults are so commonplace may lead to the availability of a defence under s 50, although the prevailing interpretation of that section may be too restrictive to apply depending on the circumstances of the case. Either way it is important to obtain patient consent to undergo a smartphone consultation process and to warn patients of its potential shortcomings²⁴². While many ambiguities remain, they are not likely to be easily resolved with law reform. Instead, practical approaches are required in terms of education, guidelines and technical support. These options are explored in greater detail in the following chapter.

²⁴² [Morocz v Marshman](#) [2016] NSWCA 202

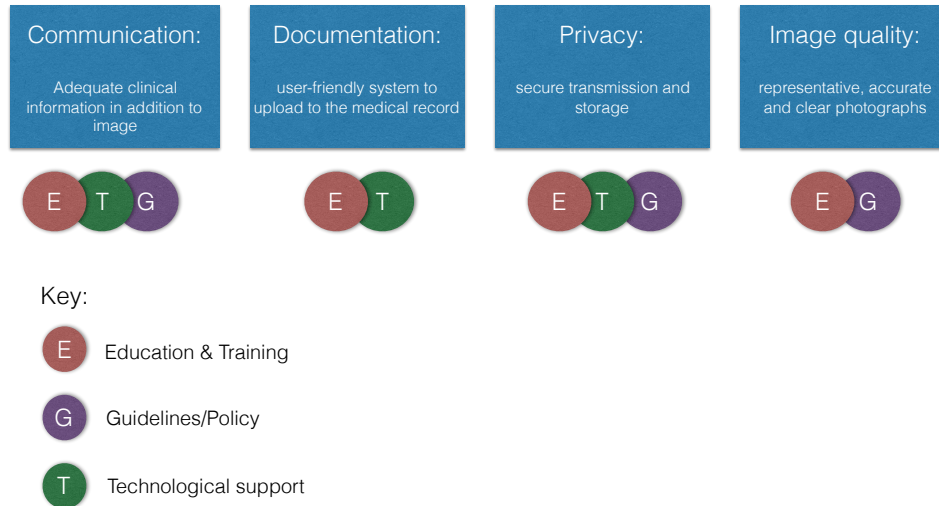
Chapter 4: Potential Solutions

4.1 Introduction

Given that the smartphone consult is clinically useful and prevalent across many medical specialties, the current NSW Health Policy approach of prohibiting smartphone use for clinical images is both impractical and counterproductive. Smartphone consults are likely to continue and increase in prevalence, so it is critical that the associated risks be addressed and mitigated comprehensively. The key risks for patients and practitioners in the smartphone consult process arise from lack of documentation, incomplete communication due to over-reliance on images, and poor image quality. Patient privacy may also be at risk, and must be protected both as a matter of professionalism and under Commonwealth and NSW legislation. Each of these risks can be mitigated through a combination of education, policy and technological support (see Figure 4-1), and implementation may need to take place at multiple levels, from individual practitioners, to workplaces, universities, colleges and state and federal government health agencies. The question is no longer *who* should be responsible for implementing change, but *who* can afford not to?

This chapter suggests measures to improve the safety and quality of smartphone consultations, considers the barriers to implementation of such measures and discusses the roles of individuals and various organisations in addressing and minimising risks.

Figure 4-1 - Main issues and proposed avenues to address them



4.1 (a) Is there a role for law reform?

In the author's opinion there is no clear role for law reform in addressing the key issues, although it could play a minor part in clarifying peripheral issues. Doctors are already bound by codes of conduct that require them to adequately communicate and accurately document patient information, and to maintain patient privacy²⁴³.

Practitioners using smartphones are often breaching legislation with regards to privacy and documentation²⁴⁴. Many doctors do so knowingly, and a proportion experience distress as a result (see Chapter 2). Introducing additional legislation that is more specific to smartphones is therefore unlikely to change behaviour. Instead, there must be attention to the reasons why practitioners do not currently comply with existing codes of conduct, privacy legislation and workplace policy when conducting smartphone consults. Behavioural change is required, and this can only be achieved with the

²⁴³ Medical Board of Australia, *Good Medical Practice: A Code of Conduct for Doctors in Australia* (March 2014) at [3.4].

²⁴⁴ Privacy Act 1988 (Cth)

support of user-friendly technology, education and realistic guidelines and policy that take into account both the value and the pitfalls of smartphone consultations.

4.1 (b) What kind of technological support, education and guidelines are needed?

Smartphone software that integrates with the medical record is required to enable fast and easy upload of clinical images into the clinical record. Recipient doctors must be able to securely access the clinical images either through a mobile platform of the electronic medical record, or through secure direct transmission from the referring doctor. Such technology currently exists, and would in the author's opinion meet the requirements of privacy legislation, as discussed below. The barriers to uptake and implementation of this technology are explored in more detail below. Guidelines are also required to clarify the appropriate avenues and procedures for communication, image capture and interpretation, documentation and responsibility for follow-up of patients.²⁴⁵ Education for medical students and medical practitioners is important for both referring and recipient doctors regarding the following issues:

- a. How to capture accurate and representative clinical photographs
- b. How to interpret clinical photographs (see Chapter 3)
- c. What is required for the consent process for a teledermatology consultation
- d. What is required to comply with privacy legislation
- e. How to utilise apps to securely transmit and/or upload clinical images (once available)

²⁴⁵ Lisa Abbott, n 20, and Lisa Abbott & Peter Soyer, "A CLOSE-UP guide to capturing clinical images," *Australasian Journal of Dermatology*, published online on 18 May 2020, < <https://doi.org/10.1111/ajd.13330>>

Section 4.3 below outlines the requirements for adequate software solutions in public and private dermatological practice, the barriers to implementation and uptake and the government and non-government bodies that may have a role to play in improving the safety and efficiency of smartphone consultations.

4.2 Protecting patient privacy during teledermatology consults – what does the law require?

4.2 (a) Reasonable steps

The Privacy Act 1988 (Cth) governs medical practitioners and private health organisations, and requires all such parties to comply with the Australian Privacy Principles.²⁴⁶ Private practices, public hospitals and clinics are covered by State and Territory legislation, which in NSW is the *Health Records and Information Act 2002* (NSW) and the Health Privacy Principles. The Australian Privacy Principles and the NSW Health Privacy Principles require practitioners and organisations to take reasonable steps to protect patient information from misuse, interference and loss, and to protect that information from unauthorised access, modification or disclosure²⁴⁷. Breach of the *Privacy Act* may have significant consequences with civil penalties of up to \$340,000 for individuals and up to \$1.7 million for companies.²⁴⁸

Whilst the Australian Privacy Principles (APP) apply only to data regarding a “reasonably identifiable” individual, sending non-identifiable patient data is neither practical nor

²⁴⁶ *Privacy Act 1988* (Cth), ss 14 & 15 & Schedule 1

²⁴⁷ See the *Privacy Act*, APP 11 and The Health Records Information and Privacy Act NSW has similar requirements of taking “reasonable” security safeguards in the circumstances – Schedule 1, HPP5; *Health Records and Information Act 2002* (NSW), Schedule 1 - Health Privacy Principle 5 (1)(c)

²⁴⁸ See ss 13G and 80W(5) of the *Privacy Act 1988* (Cth)

safe in the healthcare setting. If confusion exists as to which patient a photograph relates to, medical errors may result. In any event, identifiers are required to enable images to be uploaded to the correct patient file. Section 25 of the *Health Records Information and Privacy Act (NSW) 2002* requires health service providers to retain health information for 7 years from the last occasion on which a health service was provided to that patient, or until the patient reaches the age of 25 if that information was collected regarding a person under the age of 18. Further, even if clinical photographs are sent in a manner intended to be non-identifiable, it is possible that the patient's identity may be ascertainable due to the rarity of the medical condition, the incidental inclusion of identifying birthmarks or tattoos, or from attached metadata²⁴⁹.

In determining whether “reasonable steps” have been taken to protect information within the terms of the Act, a number of factors will be considered, including the nature of the entity, the amount and sensitivity of data held, the potential consequences of a breach, and the practical implications of implementing security measures, including the time and cost involved.²⁵⁰ Industry standards are available for reference, including the National e-Health Security and Access Framework released by the Australian Digital Health Agency²⁵¹. Standards applying to ‘bring your own device’ (BYOD), cloud computing and secure mobile applications in health are still undergoing the industry consultation process and will be published in a future release²⁵², although no time frame has yet been provided. Whilst these standards will be informative, compliance with standards alone will not necessarily equate to a finding that reasonable steps have been taken²⁵³.

²⁴⁹ See, for example, “Image forensics: What do your photos and their metadata say about you?” Richard Matthews, ABC News, 23 June 2017 < <https://www.abc.net.au/news/2017-06-23/what-your-photos-and-their-metadata-say-about-you/8642630>>

²⁵⁰ OIAC, “Guide to securing personal information”, page 12, June 2018, <https://www.oaic.gov.au/resources/agencies-and-organisations/guides/guide-to-securing-personal-information.pdf>

²⁵¹ Australian Digital Health Agency, 'National eHealth Security and Access Framework v4.0') <<https://www.digitalhealth.gov.au/implementation-resources/ehealth-foundations/EP-1544-2014>>., accessed on 12 January 2019

²⁵² Ibid. accessed on 12 January 2019

²⁵³ Office of the Australian Information Commissioner, 'Guide to securing personal information: 'reasonable steps' to protect personal information' (2015). at page 41

Some measures to protect privacy suggested by the Office of the Australian Information Commissioner include assessing software security and ensuring data is encrypted, amongst other methods²⁵⁴. It should be noted that software security is dynamic, and will change with updates to software and hardware, and with evolving knowledge as to previously unknown flaws. Consequently, software security requires processes to be in place to ensure ongoing review. Encryption methods should also be reviewed regularly to ensure they remain effective and relevant, and are actually being used where necessary, and management of decryption keys is appropriate.

If cloud computing is used, for example to store smartphone images via a secure or non-secure messaging application, it is important to ensure that the server is based in Australia²⁵⁵, or even in the same state, where possible. If the server is stored outside of Australia there may be a breach of Australian Privacy Principle (APP) 8, which restricts cross-border disclosure of personal information. APP 8.1 requires that the APP entity take reasonable steps to ensure any overseas recipient of information does not breach the APPs prior to disclosure of that information. It would be very difficult to foresee what steps would be reasonable in the circumstances. An alternative is to only transfer information to countries which satisfy subclause 8.2, which provides that subclause 8.1 does not apply to disclosure of personal information to an overseas recipient if

“(a) the entity reasonably believes that:

(i) the recipient of the information is subject to a law, or binding scheme, that has the effect of protecting the information in a way that, overall, is at least substantially similar to the way in which the Australian Privacy Principles protect the information; and

²⁵⁴ OIAC, above at n 250 pages 23-24

²⁵⁵ See *Privacy Act 1988* (Cth), Schedule 1, Australian Privacy Principle 8. Restrictions on trans-border data flows outside of New South Wales are outlined in the *Health Records and Information Privacy Act 2002* (NSW), Schedule 1 – Health Privacy Principle 14

(ii) there are mechanisms that the individual can access to take action to enforce that protection of the law or binding scheme.”

Note that it is not sufficient merely to choose a server based in a country that is believed to have similar privacy regulations, for example, the United Kingdom. There must also be a reasonable belief that the recipient entity is actually bound by similar rules (and not exempted, on grounds of which the APP entity may be unaware). According to guidelines issued by the Office of the Australian Information Commissioner, a genuine or subjective belief does not equal a reasonable belief. An APP entity must be able to justify its reasonable belief; “for example, this might be based upon independent legal advice²⁵⁶”. As conditions and legislation in other countries are subject to periodic change, and ongoing independent legal advice regarding potential contraventions of APP8 is impractical and costly, it would be prudent for Australian practitioners and organisations to restrict their data to Australian based servers.

General measures are also recommended, including use of complicated passwords, user-authentication, deletion of data where appropriate (for example, deleting of photographs from a smartphone once uploaded to the patient’s record)²⁵⁷. Data that is required to be held for a set period must also be appropriately backed-up.

Based on these guidelines, some basic steps that all smartphone owners can make with minimal effort include:

- Enabling self-locking of devices after a period of inactivity²⁵⁸

²⁵⁶ Office of the Australian Information Commissioner, 'Chapter 8: APP 8 — Cross-border disclosure of personal information' <<https://www.oaic.gov.au/privacy/australian-privacy-principles-guidelines/chapter-8-app-8-cross-border-disclosure-of-personal-information/>>

²⁵⁷ Ibid.

²⁵⁸ Australian Medical Association, 'Clinical images and the use of personal mobile devices' <<https://ama.com.au/article/clinical-images-and-use-personal-mobile-devices>>.at page 3

- Enable remote location tracking of the device in case it is lost
- Enable remote deletion of data from the device in the event of loss
- Disable Siri on iPhone when the device is locked (otherwise a non-authorised user may ask Siri to open a number of applications, bypassing the requirement to enter a passcode)²⁵⁹
- Changing cloud storage settings to ensure clinical images do not auto-upload to any social media networks or other unauthorised back-up sites
- Deleting any clinical images from the mobile device after they have been uploaded onto the patient's medical file.²⁶⁰
- Require two-step user authentication where possible.

4.2 (b) Do current practices amongst dermatologists align with legislative requirements?

Current practices, as identified from the survey data and literature in Chapter 2, often fall far short of the requirements of APP 11.1, which requires that reasonable steps be taken to protect information from misuse, interference and loss, and from unauthorised access, modification or disclosure. WhatsApp, a popular free mobile messaging client for smartphones commonly used by medical practitioners²⁶¹, is unlikely to meet this test, as it is not considered sufficiently secure for transmission of clinical images²⁶². Although WhatsApp has end-to-end encryption, messages sent using the service are routed to a WhatsApp server which may not be in the same country as the sender, potentially violating APP 8. Photographs received through WhatsApp are, by default, saved to the

²⁵⁹ Philippe Doyle Gray, 'The pillars of digital security' (2014) 69 *Bar News: Journal of the NSW Bar Association* 46. at page 56

²⁶⁰ Australian Medical Association, 'Clinical images and the use of personal mobile devices' (n258)

²⁶¹ Maurice Mars and Richard E. Scott, 'WhatsApp in Clinical Practice: A Literature Review' (2016) 231 *Studies in Health Technology and Informatics* 82-90

²⁶² NSW Ministry of Health, 'Privacy Manual for Health Information' (2015)

recipient's camera roll²⁶³, and likely to the recipient's cloud storage where it may be accessible by family members or other parties. WhatsApp is also owned by Facebook, and both organisations have recently come under scrutiny for questionable management of client data²⁶⁴.

Whether text message is sufficiently secure is unclear, and may depend on the precise circumstances in which messages are sent. For example, if messages and images are sent from an iPhone to another iOS device or Mac over wifi (that is, via iMessage) those messages will be subject to end-to-end encryption²⁶⁵. However, if the sender or recipient's phone is set up to back up messages to iCloud, the data may be easily accessed if weak passwords are utilised for this account, or if passwords are saved on an unlocked device. Images sent to non-iOS or Mac devices are even less secure, as they are not subject to end-to-end encryption.

Many practitioners currently fail to employ basic safeguards available on their devices, such as utilising complicated passwords, enabling remote deletion of data and turning off cloud backup of photographs (see Chapter 2). Even when each of these measures is in place, clinical photographs stored in the camera roll may nonetheless be accessed by other apps, which either have explicit permission to do so in order to function, or may surreptitiously gain access and transmit data back to developers²⁶⁶.

²⁶³ Whatsapp, 'WhatsApp FAQ: How to stop saving WhatsApp media to phone gallery?') <<https://faq.whatsapp.com/en/android/30031687/>>

²⁶⁴ Samuel Gibbs, 'France orders WhatsApp to stop sharing user data with Facebook without consent', *The Guardian*, (London, 19 December 2017).; Nicholas Confessore, 'Cambridge Analytica and Facebook: The Scandal and the Fallout So Far', *New York Times* (New York, April 4 2018)

²⁶⁵ Apple Inc., 'About iMessage and SMS/MMS', (Webpage, 17 September 2018) <<https://support.apple.com/en-au/HT207006#targetText=If%20you%20aren't%20using,text%20bubbles%20on%20your%20device.&targetText=You%20can%20also%20set%20up,messages%20from%20any%20Apple%20device.>>>

²⁶⁶ Quattrone, Anthony, 'Inferring sensitive information from seemingly innocuous smartphone data' (Phd Thesis, University of Melbourne, 2016)

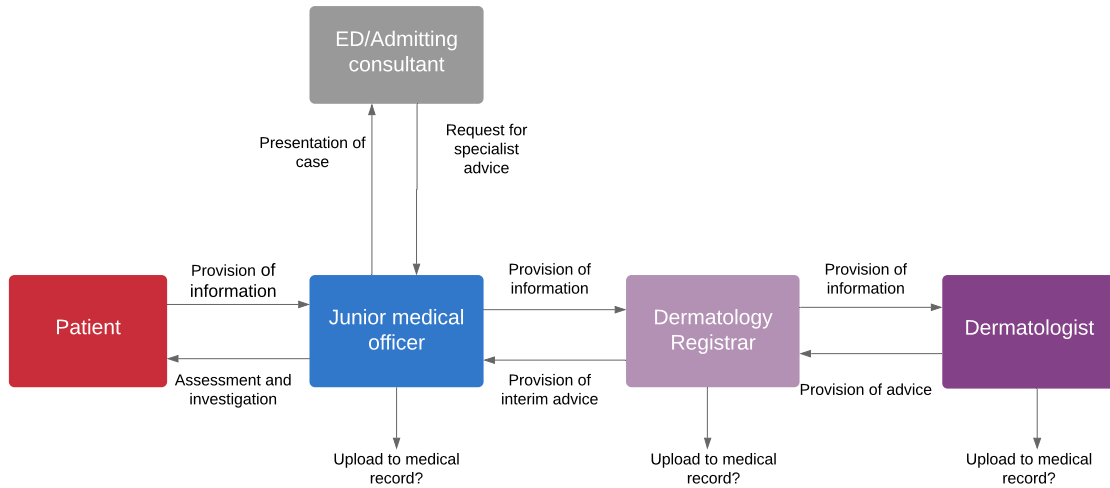
4.3 Technological solutions

There are already multiple smartphone software applications (“Apps”) available on the market that are capable of encrypting images and text, and have the capacity to integrate directly with electronic medical records to enable speedy and efficient upload of images directly into the patient’s electronic medical record. Despite offering a solution to a real problem, these solutions have not yet been adopted on a widespread basis at the hospital, state or national level, or at the individual practitioner level. There are several reasons why.

To understand what is required of an app in the public and private systems, an understanding of the ways doctors communicate in these settings is required. In the public sector, a patient presents to the Emergency Department, where they are evaluated, investigated and either discharged home with or without follow-up, or admitted to a ward under an inpatient team. If the presenting complaint is a dermatological one, the patient would ordinarily be reviewed by a junior doctor, then discussed with an Emergency Department Consultant, who may request specialist dermatological advice via the dermatology registrar. If the dermatology registrar is on site, they may attend in person, and if not, a photograph may be sent for interim advice and a clinic appointment made in the near future. The Dermatology Registrar would provide interim advice, although all cases are ordinarily discussed with a dermatology consultant. The dermatology registrar would communicate back a provisional diagnosis, and recommended management and follow-up plan (see Figure 4-2 below).

Dermatology consultations may also be made by inpatient teams for patients already admitted for other illnesses, from peripheral hospitals, or by General Practitioners.

Figure 4-2 - Public Sector



Dermatology registrars may also be responsible for capturing the photographs and collating clinical information in the first instance to send to the dermatology consultant. In this sense the dermatology registrar may be both a recipient doctor (regarding the request for a consultation from a junior medical officer), and a referring doctor (sending information to their own supervisor).

In the private sector, dermatologists may receive consultations from general practitioners, or may refer patients to other subspecialist dermatologists, plastic surgeons (particularly for joint Moh's Surgery²⁶⁷ with closure by a plastic surgeon) or may wish to send images to a dermatopathologist to accompany tissue sent for

²⁶⁷ Mohs Surgery involves surgical excision of a lesion with immediate processing of the tissue to assess whether the margins are clear prior to attempting to close the surgical wound. It is the most appropriate choice in cases where tissue conservation and/or certainty of clearance is particularly important (for example, taking a broad margin around a lesion on the face is not always possible or cosmetically desirable). Mohs surgery is performed by dermatologists who have undertaken an extra year of Mohs fellowship training.

histopathology²⁶⁸. Private dermatologists may therefore also be either a recipient or referring doctor.

Figure 4-3: Private sector - dermatologist as recipient doctor

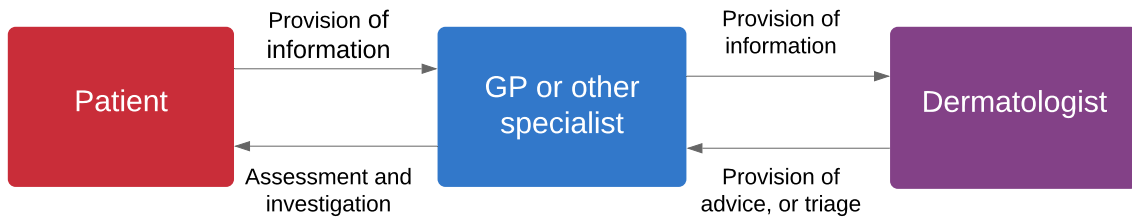
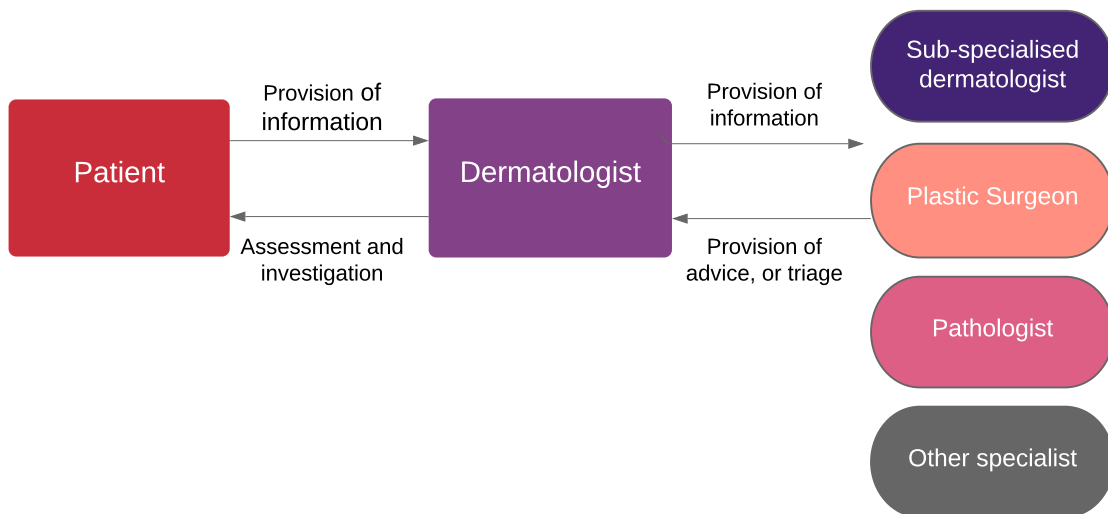


Figure 4-4 - Private sector - dermatologist as referring doctor



²⁶⁸ Anecdotally, many pathologists and dermatologists have expressed a desire to me in the course of my training for the ability to be able to upload or send clinical images to accompany tissue for analysis by pathologists, as it would provide additional information to assist interpretation of microscopic view of the tissue (and the written information regarding morphology is often limited in detail).

In an ideal world, one app would allow both secure transmission of clinical images and patient information from one phone to another, and efficient upload of images directly to the patient's electronic medical record at the push of a button. There are 2 main ways that this can be achieved. One solution may be better suited to the private sector than the public, and vice versa.

4.3 (a) Stand-Alone Secure Messaging Apps

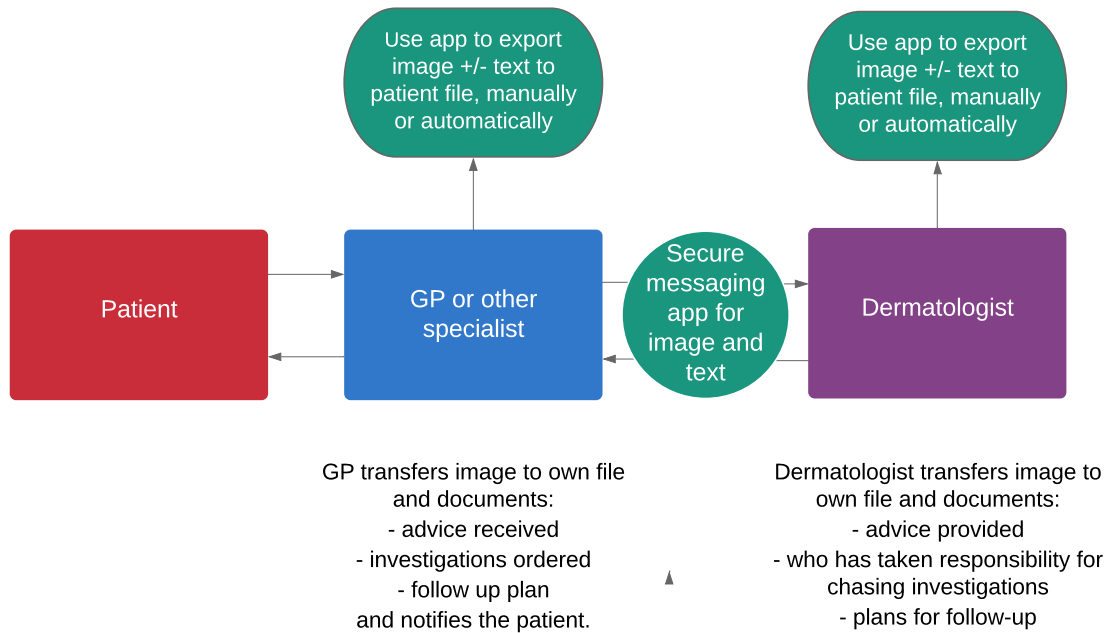
Several stand-alone purpose-built apps for clinical image capture and secure transmission are available in both Australia and abroad, although during discussions with app developers²⁶⁹ in the course of research for this thesis, it became apparent that use of these apps amongst dermatologists remains minimal. In Australia, currently available apps include: Medtasker, Clinivid, Picsafe, AfterHours, MyBeepr and MedxAu.²⁷⁰ Each app enables transmission of clinical images and text, although they have slightly different features and intended audiences. In the United States, examples of such apps abound.²⁷¹ For consultant dermatologists who work solely in private practice and rarely send images to each other or to select GPs, a stand-alone app that allows secure transmission alone without actual integration with the EMR would be a reasonable solution, as long as there is the ability to easily download images and text in a neat format which can then be uploaded to the file (see Figure 4-5). However if upload remains a completely manual (as opposed to relatively automated) process, it is unlikely to be performed with any significant frequency.

²⁶⁹ Including Katja Beitat regarding *Clinivid* (<https://clinivid.com.au>), Ken Bendall regarding *Cerner Capture* (<https://www.cerner.com/solutions/imaging>), representative of Med X <https://medxsms.com/>), Raef Akehurst of PicSafe (<https://picsafe.com/au/>) and Dr Robert Perlman of MedApps <https://picsafe.com/au/>)

²⁷⁰ M. C. Lo et al, 'PicSafe Medi: a clinical photography app review' (2015) 38(3-4) *Journal of Visual Communications in Medicine* 241-3; MedApps, 'After Hours' <<https://medapps.com.au/demonstration/>>; MedX Pty Ltd, <<https://medxsms.com/>>; MedTasker, 'MedTasker - Transform your hospital's communications' (2018); MyBeepr, <https://www.mybeepr.com/about-us>>; PicSafe Medi Pty. Ltd., 'PicSafe Medi' <<https://picsafe.com/medi>>

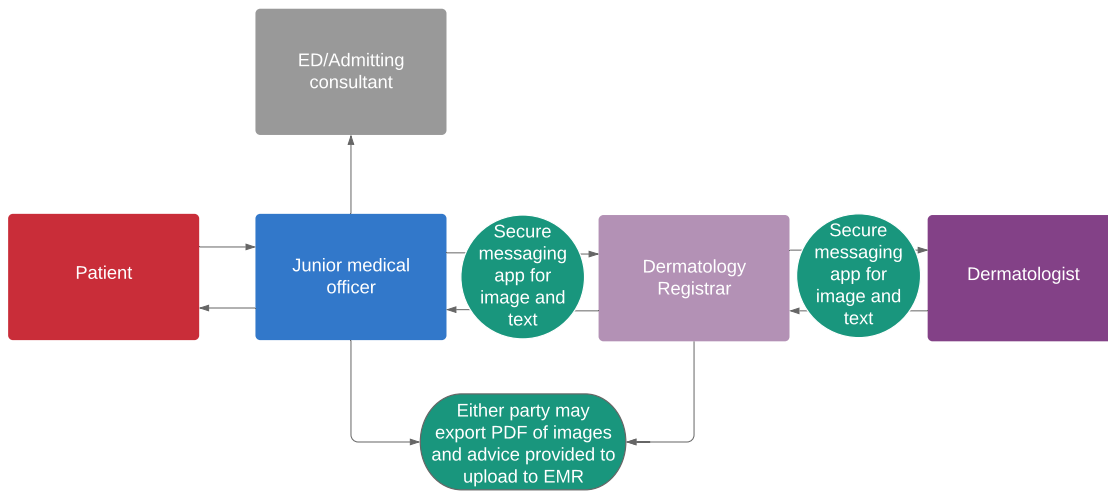
²⁷¹ See for example MedX, Epitomyze: <https://epitomyze.com/epitomyze/capture-app/Forcura> - <https://www.forcura.com/blog/hipaa-compliant-document-scanning-deliver-clinical-images-and-documents-in-real-time>, PicSafe: <https://picsafe.com/us/>

Figure 4-5 - Stand-alone messaging in private practice



Several of the Australian applications also have the capability to integrate directly with workplace EMR systems. This means that the process of uploading images into patient files can be relatively automated at the push of a button, if the workplace allows the company access to do so. However, very few hospital workplaces have enabled this functionality to date. This means that whilst communication between practitioners is theoretically secure if they select and use a secure messaging app, actual upload of those images to the patient file is neither straightforward nor encrypted at all stages of the process (although this could be made possible should the workplace administrator be convinced of the utility, safety and benefits of the app). If such apps were integrated, images could be uploaded directly from the secure messaging app into the patient's EMR with the push of a button (see Figure 4-6).

Figure 4-6 - Secure messaging in the public system



A second approach would involve images being uploaded to the EMR and a separate app, or means of communication, to make initial contact with the recipient doctor. The recipient doctor then reviews the image from within the electronic medical record (as opposed to receiving it separately as a secure message) – see Figure 4-7. For this to work in an on-call situation, the receiving physician must be able to quickly and easily access the medical record from a mobile device. Several large electronic medical record software vendors have recently designed apps, or suites of apps, that integrate with hospital electronic medical records. Epic, for example, has introduced the app “Haiku” to upload photos and view records,²⁷² which has already been successfully used in practice in the Royal Children’s Hospital in Melbourne.²⁷³ Cerner has also introduced a suite of apps purporting to allow uploading of images (Camera Capture), communication between practitioners (Message Centre), reviewing test results (PowerChart Touch) and signing forms (Mobile eSignature), such as a consent form for capture and use of images for research purposes.²⁷⁴ I will focus on Cerner in this thesis, as it is the vendor

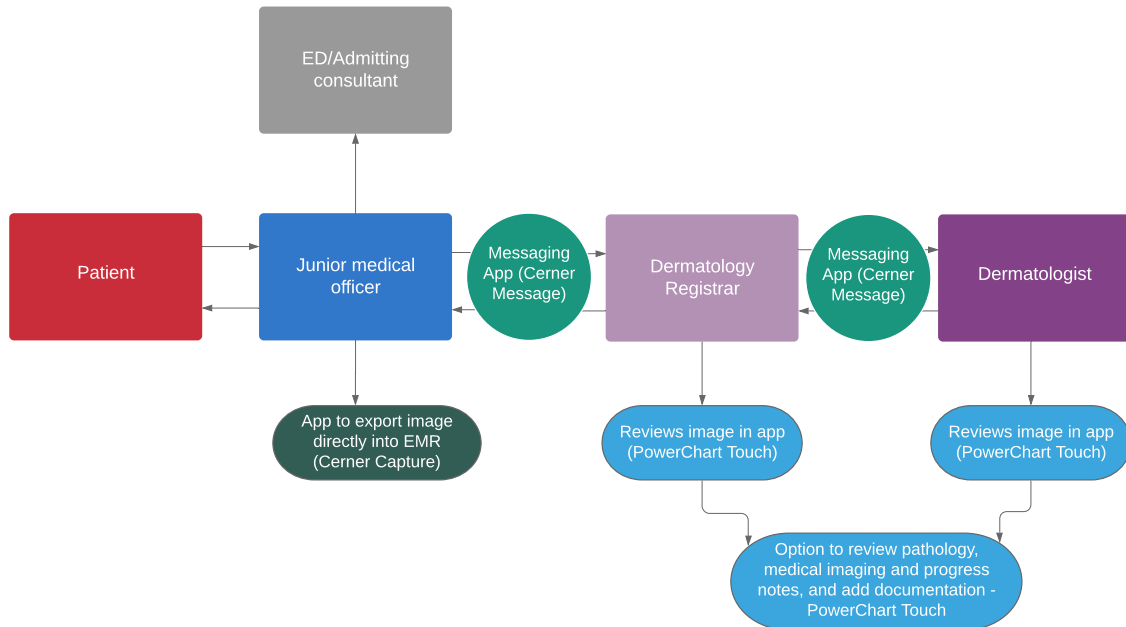
²⁷² See <https://itunes.apple.com/au/app/epic-haiku/id348308661?mt=8>

²⁷³ Royal Children’s Hospital Melbourne, ‘EMR Apps - Haiku’ <<https://www.rch.org.au/apps/emr/>>

²⁷⁴ See the full current suite of applications at Cerner Corporation, ‘Mobility’, <<https://www.cerner.com/solutions/mobility>>

of Powerchart, the software which is overwhelmingly used in New South Wales hospitals.

Figure 4-7 - Review of images on mobile platform of EMR



Whilst the second approach sounds like an ideal option, it requires a seamless EMR interface for mobile devices. EMRs were not initially designed for mobile use, and can be complex and frustratingly slow to navigate, even on a desktop. For clinicians to be willing to view images on a mobile platform of an EMR, that mobile platform must be user-friendly, easy to access, with appropriate security measures in place, and be able to operate remotely at high speed. If it is not, these various difficulties will inevitably lead to the use of non-secure methods to transmit images:

“I would take the photograph that would get stored securely in the medical record [through the Haiku app]. But because the bosses sometimes couldn’t access the medical record remotely, I’d have to screenshot them, and then send that photo via a text message. So... although the system was trying to do the

*right thing in terms of making sure that we didn't have any images on our phone and [the images] would automatically go into their files encrypted, and [be] stored securely on the hospital server on the patient's medical record, it would be ideal if the bosses could then remotely access that medical record."*²⁷⁵

Accordingly, the ideal clinical image app for smartphone consultations will have the ability to capture images, transmit them securely to other medical practitioners **and** easily upload the images to the clinical file. The advice provided via secure messaging between clinicians may or may not be included in the export to the file, and there ought to be some choice in what is exported, and how clinical information is summarised to maintain professional and pertinent notes.

This process may require 2 or more apps to be effective. Smartphone users generally accept that their device will require a suite of apps to achieve different purposes in their personal lives, which are produced by a range of developers and connect to different vendors. Some apps have a single function and perform this function flawlessly, whilst others seek to be an all-encompassing solution to problems that arise in a particular domain. Accordingly, it is possible that doctors could be encouraged to use a range of apps that achieve a variety of purposes within the clinical sphere, separating out the functions of capturing and uploading images from clinical communication between physicians in different teams, and from workflow management within clinical teams.

The system proposed by Cerner (see Figure 4-7 - Review of images on mobile platform of EMR) involves a junior medical officer uploading directly to the medical record via Cerner Capture. They then would either call the dermatology registrar or open a second app, Cerner Message, to send a text. The dermatology registrar would open PowerChart Touch to review the images captured, and any relevant results or progress notes. They

²⁷⁵ Interview 8, Dermatology Registrar.

would provide interim advice, ideally documenting directly in the chart. If the consultant needed to be contacted urgently, the dermatology registrar could call, or use secure messaging, to alert them to the patient in question. The dermatologist would then open PowerChart Touch on their phone or iPad to review the images, results and progress notes, and either advise the registrar via Cerner Message or phone, or document directly in the notes. Whilst using this suite of apps may allow for increased functionality, there is also a risk that users (particularly senior dermatologists) will revert back to non-secure messaging if the process becomes too complicated.

The recommended critical and desirable features to include on a single or suite of smartphone apps for doctors, discussed below, incorporate reflections from qualitative interviews (Chapter 2), the personal experience of the author as a junior doctor and dermatology registrar, and other sources, as referenced.

4.3(b) What features should the ideal app include?

Critical Features
<ul style="list-style-type: none">• Highly user-friendly and efficient interface• Storage of images within app or EMR, rather than camera roll• Adequate encryption for transmission purposes• Clinical images must be easily viewable on the recipient's mobile device• Photographs must be easily exportable to EMR (directly, or indirectly)
Highly desirable features
<ul style="list-style-type: none">• Direct integration with EMR to allow uploading of images directly from the app (a critical feature in the public system, and desirable in private practice)• A prompt to record patient consent for use of images• Ability to write notes directly into the EMR• Ability to customise templates for various specialties, for example, to include a brief questionnaire regarding red flags for dermatology consultations (such as presence of fevers, purpura or immunosuppression)
Helpful features

- Ability to include an institution-wide directory integrated with the on-call scheduling system allowing easy connection with the correct on-call doctor²⁷⁶
- Event-driven alerts to allow critical notifications to be sent as a task to be completed, to ensure the communications loop is closed²⁷⁷
- The ability to receive patient photographs via AirDrop/Bluetooth to upload directly into the patient file with an annotation to indicate the date of capture and any other useful clinical information.

4.4 Barriers to widespread adoption of software solutions

There are several factors that have the potential to slow, or halt, the uptake of technological solutions. These include lack of critical mass amongst practitioners with any one secure messaging app, the limited ability of some current EMR systems (for example, Cerner) to cope with images²⁷⁸, the cost and infrastructure required to store the large amounts of data contained in images, and the costs of software licensing. Some of these issues will need to be addressed at multiple levels, from the individual practitioner, to state and federal health agencies.

4.4 (a) Critical mass

The current lack of widespread use, or critical mass, involves a circular causality issue. That is, not enough individual doctors are willing to use the app until enough other doctors are *already using* the app. This is because sending an image via a secure messaging app requires the recipient to have already downloaded the app. If they have not already done so, the requesting practitioner may face delays whilst the intended

²⁷⁶ http://www.spyglass-consulting.com/press_releases/SpyglassPR_CLINICAL_COMM_2018.v1.0.pdf

²⁷⁷ Ibid at 276.

²⁷⁸ In the author's personal experience, when images are stored within the Cerner progress notes (not something that the system was built to enable), the note is much slower to load, leading to frustration and inefficiency.

recipient downloads the app, registers for authorised use and becomes familiar with the software. This may be more difficult for less tech-savvy practitioners, but even for doctors who are accustomed to downloading applications, the time and hassle required on the part of the recipient may deter referring practitioners, who are after all requesting help, from suggesting or insisting that the recipient use purpose-built software. Similarly, the recipient doctor may not wish to ask the requesting doctor to send images through an app unless they are already proficient users, otherwise there may be associated delays which are not ideal for patient care, or for workflow.

This is an issue in private practice as well as public hospitals:

“I know there are now some apps which I’ve seen which are very secure, where you know, images and data are transferred very securely, but they require a hell of a lot of hassle. For example, the parties all need to be in on it, so, it’s not a universal thing, not like text messages, which is very universal, everyone can do it....

*[Secure messaging] may work in a hospital, but once you’re out of [the hospital], what happens? **We get referrals from everybody, not just hospitals.** Within a hospital, if they say ok, if you’re going to work here you have to message this way, then we will play ball - but I’m in private practice. **It’s an extra layer of hassle.**”²⁷⁹*

A relatively consistent approach to app choice amongst practitioners would improve utility of the app for secure messaging. Ideally this would be achieved at a national level, but if not, a consistent approach state-wide would be an acceptable starting point. However, hospitals, dermatology departments and individual doctors need not (and arguably cannot) wait until a decision is made at the state or national level. The remainder of this chapter assesses the role of various parties in improving the safety of

²⁷⁹ Interview 9, Consultant Dermatologist

smartphone consults at each level, from the Australian Digital Health Agency to the individual practitioner, and suggests approaches to address barriers to implementation of practical and technological solutions.

4.4 (b) Roles and responsibilities

Ideally, achieving widespread uptake of software for clinical image transmission and upload would be determined at a national level to enable consistency for a mobile workforce that is registered to work across multiple states and territories. This would also be the most cost-effective approach, ensuring that the same questions would not need to be revisited on multiple occasions by multiple agencies.

The wide variety of electronic medical record software vendors supplying different hospitals across Australia means that selection of one app to be used nationwide is unlikely to be feasibly achieved until sufficient interoperability exists between products from different healthcare vendors. Interoperability in healthcare is the capacity to send data between health IT systems, and to receive it in a usable format. To date most vendors utilise what equates to different languages to design their software, meaning that information is effectively siloed in one electronic health record system, as changing vendors or integrating with other services involves licensing, training staff to use the new system effectively and paying for release of information or customisation of systems to the workplace in question. Hospitals are relatively captive to the software that their vendor has produced, regardless of whether it is the most efficient or user-friendly app available. If interoperability in healthcare software is achieved by adopting a universal standard or “language”, hospitals will have greater freedom to choose from a range of apps that have the ability to integrate seamlessly with existing software and address the specific clinical needs of the service.

The United States Congress has encouraged a move towards interoperability by commissioning a report from the Office of the National Coordinator for Health Information Technology (ONC) regarding the issue of “data blocking” or “information blocking” by vendors. Data blocking generally involves knowing or unreasonable interference with the exchange or use of health information. The ONC was instructed to “certify only those products that clearly meet current meaningful use program standards and that do not block health information exchange” and “decertify products that proactively block the sharing of information”²⁸⁰. Subsequently a number of US-based vendors have joined together to make a pledge led by the US Department of Health & Human Services to eliminate information blocking, and to employ the HL7 Fast Health Care Interoperability Resources (FHIR, pronounced “Fire”, designed by Melbourne-based developer Grahame Grieve) which enables the flow of data across disparate health IT systems²⁸¹.

FHIR is an open-source standard and API (application programming interface) for exchanging healthcare information electronically. It has a few key advantages over previous standards, which have previously been centred around full document exchange and “push” models, which require the holder of the information to initiate sending the information in some way. Instead, FHIR takes a “pull-based” approach to accessing data. The data itself is broken down into “resources” (as compared to importing whole documents – an approach which doesn’t enable users to run queries to find important information quickly). However, the most important advantage of FHIR is that it is already in use by major vendors such as Apple, Google, as well as each of the 10

²⁸⁰ The Office of the National Coordinator for Health Information Technology, “2015 Report to Congress on Health Information Blocking” (Washington D.C., United States, March 2015). Note that the certification program is voluntary, however loss of certification appears to be a significant motivating factor for electronic health record software vendors to alter their approach.

²⁸¹ HL7, 'Welcome to FHIR!' <<https://www.hl7.org/fhir/>>

healthcare vendors with the biggest market share in the United States²⁸². These include Epic and Cerner, whose software is widely used in Australian hospitals.

To choose a standard that differs from the one most widely used in the United States would be limiting for Australian health systems and technology developers. However, regardless of the standard chosen, once a standard is universally applied in Australia, smaller developers will be able to write plug-ins which operate easily with different software systems, and consequently communication systems will become more customisable. Larger vendors will also have greater incentive to improve the utility of their products to retain market share. It is conceivable that the future of electronic health records will *“look a lot like your phone... How many people use an email client that isn’t written by Apple, or the Facebook app, or Twitter? Those weren’t written by Apple. Apple just provides the platform. And I think that’s what EHRs are going to look like. Eventually, we’re going to stop building the Swiss Army knife, and we’re just going to have a basic platform with lots of little applets sitting on top of it.”*²⁸³ The cost of secure messaging software is likely to decrease as apps from a multitude of developers hit the market.

The Australian Digital Health Agency (ADHA), previously the National e-Health Transition Authority (NEHTA), is reportedly aiming to address the inconsistent approach to secure messaging and information exchange across Australia, and has set up a “Secure Messaging Program” to “work with industry, suppliers of secure messaging solutions and clinical software vendors to reduce barriers to adoption.”²⁸⁴ It should be noted that the Secure Messaging Program is not aimed directly at smartphone secure messaging apps. However, the steps taken to improve secure messaging between various forms of

²⁸² Mike Miliard, 'ONC data projects FHIR catching on at hospitals and practices in 2019', *Healthcare IT News* (October 01, 2018).

²⁸³ Stanley Crane, Chief Information Officer at Allscripts (Australia/NZ-based Electronic Medical Record software vendor), as cited in Jennifer Bresnick, 'Why Health Data Interoperability is Setting EHR Vendors on FHIR', *Health IT Analytics*, 15 March 2016) <<https://healthitanalytics.com/features/why-health-data-interoperability-is-setting-ehr-vendors-on-fhir>>; *ibid*

²⁸⁴ Australian Digital Health Agency Annual Report 2017–18, Sydney, at 31

electronic medical record software (for example, the sending of discharge summaries from a hospital to the electronic file in a general practice) will also improve the framework upon which secure messaging smartphone apps may be built. Although ADHA (and its predecessor NEHTA) has reportedly prioritised secure messaging over the previous decade,²⁸⁵ there has been no demonstrable progress to date. The first step in this process is to finalise industry specification and guidelines for secure messaging. Such standards are not due to be published until 2022²⁸⁶. State health departments need not, and arguably cannot wait several years to implement technological solutions to enable quick and effective communication channels between health professionals that meet legal requirements and operational requirements.

4.4 (c) The role of NSW Health

New South Wales Health is in a particularly privileged position to influence practice in its state, because almost all of the public hospitals in NSW use one vendor (Cerner), as opposed to Victoria, where there is software from more than 5 different vendors utilised across the state in public hospitals. As doctors regularly move between hospitals as part of their training (as regularly as every 6-12 months), it would be useful if apps that meet legal and operational requirements are identified and promoted on a state-wide basis to minimise the re-training required by staff. E-Health NSW claims that secure messaging and e-referral management is a priority for the organisation over the next 1-7 years²⁸⁷. Recent communications between the author and e-Health NSW

²⁸⁵ Dr Rhonda Jolly, 'The e health revolution—easier said than done' (Research Paper no. 3 2011–12, Parliamentary Library, Parliament of Australia, 17 November 2011); see also National E-Health Transition Authority, 'NEHTA Blueprint Version 1.0, Draft for Consultation' (13 August 2010). http://ict-industry-reports.com.au/wp-content/uploads/sites/4/2013/09/2010-NEHTA-Blueprint-v1_0-DRAFT.pdf at pp 5 & 16

²⁸⁶ National Digital Health Strategy 2 August 2018

²⁸⁷ NSW Health, 'eHealth Strategy for NSW Health 2016-2022', <<https://www.health.nsw.gov.au/eHealth/Documents/eHealth-Strategy-for-NSW-Health-2016-2026.pdf>> at 14

confirm that they are currently in the process of investigating software options to create a Clinical Communication and Collaboration platform. This platform will reportedly allow secure messaging between practitioners, secure upload of clinical images directly into the patient file and viewing of patient images on a mobile platform. Doctors may also be able to remotely enter clinical notes on the medical record, and critical clinical communications such as paging and notification of results may also be supported. An Expression of Interest for software that allows creation of a Clinical Communication and Collaboration platform, accessible by smartphone, was released in the first quarter of 2019, with the results of the Expression of Interest to inform a subsequent implementation planning and business case effort. A rollout of some capability in support of priority use cases is expected to commence over 2019, although this is dependent on funding availability and information obtained on market capabilities from the EOI²⁸⁸. If NSW Health is able to successfully implement a secure platform through which doctors can communicate and review images on a state-wide basis, it could have a profound impact on practitioners in general and private practice, including dermatological practice, as well as in other states.

4.4 (d) The role of individual hospitals and associated local health districts

Although the approach of New South Wales Health to introducing clinical photography apps is promising, public hospitals cannot necessarily afford to wait to address issues of privacy and patient safety. This is particularly applicable if that hospital is located in another state with no imminent solution. Hospitals are in a unique position to encourage or mandate that all employees use one preferred secure messaging service. Although several apps have been trialled at various hospitals, ongoing use of such apps has been limited²⁸⁹. Hospital administrators face several barriers in implementing new

²⁸⁸ Email between the author and e-Health NSW Representative on 15 January 2019

²⁸⁹ I have spoken with both software developers who report their apps have been trialled in several hospitals, and Chief Medical Officers who report their experiences of trials of vendor software. Some of the barriers are discussed in further detail later in the chapter. The few hospitals who take an ongoing interest in using secure messaging services are mostly children's hospitals, for example the Sydney Children's Hospital Network which uses a messaging app between patients' families and medical practitioners

software systems. In an interview with a Chief Medical Officer whose hospital had trialled both a stand-alone messaging app and a large vendor's integrated image upload service, the reported primary barrier was a lack of appreciation of the need for a secure messaging system: "the resistance we faced was apathy, really!"²⁹⁰ Notably, use of the app was not *mandated* by the institution. This was a conscious choice on the basis that the effectiveness and appeal of the app had not yet been established, and "we don't want to say 'you will use this', and then if it falls flat, in 6 months say 'no, you will use this one', then 'you'll use this one'. *It's got to work organically.*" Mandating the use of a medical messaging app in the future has not been ruled out, however to do so the software would need to be functional and efficient, and "we just don't have the product yet." There was also concern on the part of administration that incorporating fragments of medical conversations, or the entirety of medical conversations into the medical record may result in a dilution and degradation of the clinical record.

Introducing a mandated app for secure messaging and upload may yield additional benefits which include increased capacity for workforce planning, as data regarding the number of smartphone consultations could be used to improve workflow and allocation of staff and other resources²⁹¹. Secondly, the accuracy of medical progress notes may improve with the ability of the person providing specialist advice to directly record their instructions to the treating team, rather than relying on the recipient doctor to transcribe that advice (see Chapter 2).

Some lessons may be learned from the experiences of other hospitals in integrating secure messaging apps. A recent study by Jost reported on issues arising out of the

and imports those messages into the EMR, and the Royal Children's Hospital in Melbourne, which utilizes *Haiku*, an app which integrates with the Epic EMR system and allows upload of images.

²⁹⁰ Interview with Chief Medical Officer (hereafter referred to as "CM") on 7 September 2018

²⁹¹ NSW Ministry of Health, 'NSW Health Analytics Framework: Transformed health through data and insights - a five year vision for Analytics in NSW Health' (Sydney)

<http://www.ehealth.nsw.gov.au/__data/assets/pdf_file/0020/303752/NSW_Health_Analytics_Framework.pdf>

integration of the Haiku and Canto apps (the iPad version of Haiku) produced by Epic into the University of California Davis Health System (UCDHS)²⁹². Despite apps being made available for 6 months, only 8.94% of physicians within the health service were using the application²⁹³. Although adoption rates were low, those who used the app used it regularly and reported high levels of satisfaction. In those circumstances it seems unlikely that user interface and utility of the app were contributing significantly to the lack of uptake of the app in question. Notably, in that study, wireless internet was not offered in all clinic buildings and cellular service was patchy. Additionally, the process for requesting, downloading and creating an account for the apps required users to submit a request to the IT department, with a minimum of one to two weeks between applying and configuration of the app for use.²⁹⁴ The apps were not promoted by hospital staff, training was not provided other than on an online intranet site, and adoption was not incentivised²⁹⁵. Some of these issues may be addressed by appropriate app choice, provision of high-speed wireless internet throughout all hospital areas, promotion of the application, expedited registration through the IT department and effective training provided in how to best utilise the features of the app.

Other issues arising from subsequent discussions with my own workplace include the degree of storage space required for large, or multiple, clinical images within an EMR system which was not designed to handle large files. More consideration is required as to the size of images allowable and how to limit this, having regard to the fact that excessive compression of image files may lead to loss of quality and compromise clinical usefulness. This issue is complicated, but not insurmountable if IT advice is applied regarding the appropriate degree of compression (if any at all).

²⁹² Melissa Jost, 'Mixed Methods Study to Investigate Physician Adoption and Use of a Mobile Electronic Health Record Application' (Masters of Health Informatics Thesis, University of California, 2011)

²⁹³ Ibid at 52

²⁹⁴ Ibid at 59

²⁹⁵ Interview 11 with CM: "[the app] had privacy overlays- they were also the bits they didn't like!"

Another solution is to use a picture archiving and communication system (PACS), which is used to store the very large data files produced by the radiology department²⁹⁶. Almost all hospitals in Australia already have access to PACS, although it can be slow and frustrating to view data from this system. Persevering, despite the slow speed, is worthwhile when reviewing a radiological study, as the file size is very large and image quality is highly important. The file size of clinical images for dermatology, although cumulatively large, is not great enough for individual photos or series of photos to justify diverting from text message to an app that lacks a user-friendly interface. This system would be very useful in the public hospital clinic setting for uploading pre-surgical images and to document clinical progress, however has little utility for consult purposes. Further, where it has been implemented, there was little option to customise: *"[the process of uploading images] is reasonably good, although we've wanted to tweak it, but [international corporation] is not a company that abides tweaking, apparently."*²⁹⁷ Whilst images may be easily uploaded to the file, there is no easy way to view those images remotely from a smartphone: *"I think if you're sending a photo using that app to a registrar who's perhaps out at a concert or something and looking on their phone, I don't know that they can access it... they probably technically could, but it would go through [the EMR], and you'd need an authentication code, so you'd be there for an hour."*²⁹⁸ For remote consultations, this system does not therefore provide a workable solution.

²⁹⁶ Strickland NH, 'PACS (picture archiving and communication systems): filmless radiology ' (2000) 83 *Archives of Disease in Childhood* 82-86

²⁹⁷ Interview with CM on 7 September 2018

²⁹⁸ Interview with CM on 7 September 2018

4.4 (e) The role of medical specialty colleges

Medical specialty colleges are also in a position to take a proactive role in advising, training and auditing their fellows and registrars regarding communication practices. The Australasian College of Dermatologists (“the College”) is in a unique position to influence practices, given that dermatology is one of the specialties in which clinical images feature strongly in day-to-day practice. To create the critical mass required to ensure functionality of a messaging app, it would be ideal if Colleges could recommend 2-3 apps that meet functional requirements, allowing a choice between providers, while also ensuring that usage is not split excessively between many different apps. Depending on functionality and appreciation of the need for secure messaging, uptake of this app may then spread to general practice, pathologists, surgeons, and junior doctors throughout hospitals who seek dermatological advice.

If the College does recommend a particular app for use, it would be important to select that app carefully, because introduction of an app with a “clunky” user interface may decrease future receptiveness of dermatologists to more elegant and user-friendly apps that may emerge with time. Secondly, it would be important to take care with the manner in which such advice was provided. If the College mandates the use of one specific app, and there are deficiencies in the app which cause injury to a patient (for example, failure to deliver a proportion of the images), this may reflect poorly on the College, and could in theory lead to a claim in negligence against the College. A risk of harm to a patient as a result of failure to exercise due care in selecting an appropriate app for mandated use may be considered reasonably foreseeable: a risk may be considered reasonably foreseeable, even if it is remote or highly unlikely²⁹⁹. If the risk is considered foreseeable, the tribunal of fact must decide what a reasonable person would do in response to the risk, taking into consideration the magnitude of the risk, the

²⁹⁹ Wyong Shire Council v Shirt (1980) 146 CLR 40

probability of the risk occurring, the expense, difficulty and inconvenience of taking alleviating action and any other conflicting responsibilities the defendant may have³⁰⁰. In addition to balancing these considerations, s 5B of the Civil Liability Act requires consideration of the social utility of the activity that creates the risk of harm.

Rather than mandating any single app, and reviewing it on a regular basis to ensure it remains fit for purpose through updates and other changes in the technological, clinical and legal landscape, an alternative to selecting one specific app would be to set minimum standards for secure messaging applications to guide practitioners in their choice³⁰¹.

One way to increase uptake amongst members could be to ensure that continuing professional development (CPD) points are available to those undergoing training on key topics relating to effective use of apps for clinical imaging. These topics could include clinical photography technique, the importance of utilising secure methods for transmission and storage, and the imperative to upload clinical images into the patient file, along with links to the apps which are currently most popular amongst dermatologists or Australian doctors in general. The College's e-Health Committee is currently in the process of determining how best to deliver this education (for example, via online webinar, online modules, or at the yearly College Annual Scientific Meeting).

³⁰⁰ Civil Liability Act 2002 (NSW) s 5B

³⁰¹ The College's e-Health Committee is currently drafting these standards and they are due for completion within the next 6 months.

4.4 (f) The role of individual doctors

The drive to increase use of secure messaging apps must start somewhere. Even if delays continue on the part of national and state government and workplace administrators, senior doctors are well placed to have an impact on the doctors around them³⁰², which may have flow-on effects to other doctors. A consultant in a hospital department with high levels of image transfer, such as dermatology, may be able to exert influence beyond the department by increasing usage of secure messaging methods amongst dermatology registrars, who in turn may insist that junior doctors use the same method to communicate with them. This will only occur on a widespread basis if practitioners are very satisfied with the user interface and ease of use, and if other barriers to app usage are addressed by the employer (for example, by ensuring that use of an app is not in direct contravention of hospital policy).

4.5 Implementation

It will not be sufficient for a workplace or government agency to simply select an app for use and integrate it with the EMR. Training of practitioners in appropriate use of the app and its features is important to minimise data entry errors, such as hastily entering information in the wrong patient file or incorrectly coding categories of data.

Consultation with clinicians about barriers to use and difficulties with the user interface are required to ensure continued use of the secure messaging option over faster and more efficient methods such as text message and WhatsApp. Providing high speed wireless internet throughout the hospital, and speedy and efficient IT support services will also be critical in ensuring continued use. Selected software will also need to be regularly reviewed to ensure it remains sufficiently secure, and that the software is

³⁰² See Chapter 2.

updated appropriately when smartphone operating systems are updated to avoid errors and bugs arising from any aspect of incompatibility. It would be ideal if this process was centralised to either e-Health NSW or the Australian Digital Health Agency so that this process is not replicated many times over, potentially at great expense, in IT departments of individual hospitals in Australia.

Before apps are integrated, a decision must be made by a duly qualified person or body as to the integrity of the app, and whether use of the app is likely to satisfy the requirement for “reasonable steps” to have been taken to protect patient privacy on a regular basis. The ability to make such a decision is likely beyond individual practitioners and small practices, as it requires a significant degree of IT knowledge and experience. Hospitals or state health departments could engage IT experts, the Australian Digital Health Agency or even perhaps the NSW Privacy Commissioner³⁰³ or Commonwealth Privacy Commissioner to provide an assessment as to whether an app provides sufficient safeguards to satisfy privacy legislation³⁰⁴ prior to integrating that app with highly sensitive medical records. Both the NSW and Commonwealth Commissioners have the powers to carry out such assessments. Such advice would fall within the Commissioner’s role to *“provide assistance to public sector agencies in adopting and complying with the information protection principles”* and to *“prepare and publish reports and recommendations about any matter (including developments in technology) that concerns the need for, or the desirability of, legislative, administrative or other action in the interest of the privacy of individuals.”*³⁰⁵

³⁰³ Privacy Act 1988 (Cth), Australian Privacy Principle 10.2.

³⁰⁴ Privacy Act 1988 (Cth) - Part IV, Division 3A <https://www.oaic.gov.au/privacy/privacy-assessments/>

³⁰⁵ Privacy and Personal Information Protection Act 1998 (NSW) (“PPIP Act”) s36(2)(j)

4.6 Conclusion

Technology is available to solve many of the medicolegal risks associated with capture, transmission and documentation surrounding clinical images. There are several iterations of such software currently available that may be integrated into existing electronic medical record systems. Whether the best solution takes the form of a single app to allow capture, transmission and upload of clinical images, or a suite of apps that allow more detailed review of the patient file at the same time, is a question that should be addressed with further research. This could be done by conducting a trial of each type of software in similar settings, looking at rates of uptake, percentage of cases documented with images and notes, rates of reversion back to non-secure methods of messaging and rates of concordance of smartphone tele-dermatology opinion with face-to-face review of the same patient³⁰⁶. Whichever approach is chosen, it is important that the actual software be highly user-friendly, and well supported with adequate training, high speed wireless internet throughout the hospital and expedited registration for use of the app through the institution's IT department. Additionally, funds and technical support must be provided to enable the upload and storage of a large quantity of image files within the EMR and required offsite backups of patient files.

Multiple organisations are in a position to play a role in creating secure messaging systems for clinical images, and ensuring their ongoing success. However, given the glacial progress in this area to date, the question is no longer which agency or organisation would be the most appropriate body to take control of advancing this issue, but whether it is conscionable or advisable for any party responsible for patient care to wait until a workable solution eventually emerges from elsewhere. The

³⁰⁶ That is, how close the smartphone assessment is to the advice provided during face-to-face dermatological review.

Australian Digital Health Agency ought to be taking a prominent role in this process. However NSW Health, local health districts, individual hospitals, private practices and individual doctors each have the power to make decisions which improve their ability to safely and securely capture, transmit and upload clinical images into the patient record. Failure to take such steps, when such technology exists, might result in an institution or individual practitioner being liable in negligence should an error arise in the process of smartphone consults. No legal defence is likely to be available on the grounds that other doctors, hospitals and health agencies were also failing to protect patient safety, privacy and ensure adequate documentation.

Until such technology is adopted on a widespread basis, Colleges whose constituents regularly use clinical images in the course of their practice, such as the Australasian College of Dermatologists, have a significant role to play in providing guidance, education and raising awareness of the risks of failing to implement appropriate messaging and upload systems. A similar role may be played by universities, medical indemnity insurers and the Australian Medical Association. The Australian Medical Council may play an overarching role in ensuring medical schools, junior medical officer training programs and speciality colleges include sufficient teaching on clinical images and smartphone use as part of its role in assessing and accrediting training programs.

Individual doctors would be well-advised to protect their patients, themselves and their reputations by implementing their own strategies, such as asking their referrers to send images via a secure messaging app and uploading the images in the most secure manner available to them. While this approach may seem tedious initially, with time uptake will increase and delays in provision of images to referrers will decrease. As there is a power differential between the referring and recipient doctor, it is most appropriate that the recipient doctor (for example, the dermatology consultant) takes a proactive role in

requesting the use of secure messaging applications. Referring doctors still have the ability to suggest the use of such an app, even if they cannot necessarily insist on it.

Although the problem is by no means easily solved, all the required tools to solve it are currently available. To ensure patient privacy, safety and optimal patient care is maintained in a smartphone consult, government agencies and medical organisations need to provide leadership by recognising that these problems exist, and commit to implementing solutions within a reasonable timeframe. The current status quo is untenable, and doctors, educators, employers, and the government all have a role to play in turning the tide towards improved patient safety and privacy.

Chapter 5: Conclusions and Recommendations

5.1 The utility of formal and informal teledermatology

Although dermatological presentations account for a significant proportion of presentations to general practitioners and emergency departments, most medical practitioners receive little, if any, focused dermatological teaching at medical school. A face-to-face consultation with a dermatologist is usually preceded by a considerable waiting period, not only in rural and remote areas, but in major cities as well. These two factors in combination predispose many dermatology patients to a significant risk of misdiagnosis and mistreatment until specialist dermatological opinion can be obtained.

Formal teledermatology is underutilised at present, likely due to the lack of Medicare rebate for store-and-forward consultations, meaning the time devoted to providing specialist advice is unpaid. Nonetheless, this thesis has demonstrated that despite lack of rebate for the process, *informal* smartphone consultations have become common practice in dermatology. There are a number of reasons for this. Firstly, many public hospital dermatology registrars and consultants are required by contract to provide interim advice regarding inpatients and emergency patients for matters that are not immediately urgent and do not require face-to-face attendance during after-hours periods. Further, when providing dermatological cover for peripheral hospitals it may not be possible or practicable to have a dermatologically trained doctor attend in person. In these circumstances, the alternative choices to smartphone consultations include conducting the consultation without clinical images and relying instead on a possibly inaccurate description provided by a non-dermatologically trained doctor, or engaging in formal videoconferencing or store-and-forward teledermatology through

secure channels (a service most Australian hospitals do not yet support with adequate software or training) – see discussion at 1.4.

Informal teledermatology steps into this void, allowing immediate transmission of clinical images and information between non-dermatologically trained doctors and dermatology trainees. Another void (which is less comfortable to acknowledge) is the nebulously-defined supervision of trainees by off-site consultants. Few patients who are admitted to a public hospital for medical care would suppose that important decisions about their care are being made out-of-hours by relatively junior practitioners. The increased degree of supervision possible via smartphone consultant review has the potential to improve outcomes for dermatology patients, while simultaneously improving education for registrars. This impact may be extended beyond the individual registrar involved in the case by instituting a formal weekly process for clinical image review with other registrars and consultants from the department, similar to the multi-disciplinary radiology meetings that already regularly take place in the public hospital setting. This would enable provision of feedback to registrars, detailed discussion and documentation of a consultant-approved plan for management for each patient in the EMR. More formalised, directed education on high quality photography, teledermatology, technology and legal issues such as privacy, consent and data security may have a lasting impact on dermatological practice, as these doctors will become the next generation of consultant dermatologists responsible for supervising and training dermatology registrars.

5.2 Current practice

The survey in Chapter 2 demonstrated that dermatologists and dermatology trainees are routinely receiving, and often sending, clinical images using their smartphones.

Dermatology trainees receive clinical images disproportionately often, reflecting their role as the first port of call for inpatients and emergency referrals. All trainees interviewed valued the ability to obtain immediate consultant review and advice on the basis of clinical images, and felt that this improved patient care.

A majority of dermatologists and dermatology trainees find clinical images important to their clinical practice (see 2.3(e)), and continue to send and receive images despite concerns regarding patient privacy and in some cases, despite knowledge of prohibitive policies in their workplace against the practice (see 2.3(l)). Images are rarely routinely uploaded to the patient file (see 2.3(i)). Survey recipients reported that where software has been introduced that enabled them to send, receive and upload clinical images, that software was used (see 2.3(j)).

5.3 Risks associated with informal teledermatology

Although smartphone consultations are convenient and fast, their ability to enhance the quality of clinical information available depends on whether the consultation is accompanied by high quality clinical images and adequate communication between practitioners (see 2.4(c)). The lack of education at all levels regarding capturing and interpreting clinical images and technological and legal aspects of telemedicine often translate to poor quality photographs and clinical information, a lack of adequate documentation of the consultation and questionable attempts at informed consent. Whilst risks to patient privacy are significant, the risks of misdiagnosis and fragmentation of medical records pose far greater risks to patients and practitioners. Nonetheless most, if not all, of these issues may be resolved with adequate education and technological support (see 2.4(d)).

Regard must also be had to the impact of smartphone consultations on trainee wellbeing and quality of life. Several of the trainees interviewed reported receiving a large proportion of consultations out-of-hours for matters which were long-standing and non-urgent, which prior to the existence of smartphones would ordinarily have been the subject of a referral letter to the outpatient clinic to be triaged and seen as appropriate. The barrage of calls and text messages over evenings and weekends for non-urgent matters unnecessarily interferes with the ability to engage in study and other activities outside of work. This may be partly due to the perceived ease of smartphone diagnosis, and also due to a shift towards a culture where immediate answers are often expected to be available and easily accessible, not only in medicine, but in life in general. This issue requires education of hospital staff and a cultural shift amongst patient populations, who often utilise Emergency Department resources for non-urgent matters, resulting in a degree of pressure upon emergency staff to provide an immediate diagnosis.

5.4 Is a duty of care owed in relation to smartphone consultations?

Consultations that take place over smartphone *ought* to be no different from routine consults, but they are, as discussed in Chapter 3. There are two main reasons for this. The first is that smartphone consults fall midway between the formal consults that occur routinely in clinical practice, where the existence of a duty of care is clear, and the casual ‘corridor consults’ where no such duty likely exists (see 3.1). The associated ambiguity may lead to confusion amongst practitioners regarding responsibility on the part of the recipient doctor in terms of documentation and follow-up. It is also associated with legal ambiguity as to when a duty of care arises. No case law addresses this question directly in Australia. Extrapolating from existing legislation, regulations, guidelines and case law regarding professional duties and obligations, it would seem that a duty of care *may* arise, depending on a number of factors. These factors include

whether significant harm to the patient is reasonably foreseeable, an assumption of responsibility on the part of the recipient doctor, a degree of reliance on the part of the sending doctor, proximity, any pre-existing relationship or obligations (such as a contractual duty to provide out-of-hours advice), control over the factors creating the risk, and the nature and consequences of actions that could be taken to avoid harm (see discussion at 3.2).

If the recipient doctor is aware that inadequate information or photographs have been provided by the referring doctor, it would be important for the recipient to inform the referring doctor of this. If the recipient doctor decides to provide advice despite a lack of adequate clinical information, a statement regarding the inadequacy of information provided will not necessarily provide protection against liability should the advice result in harm to the patient. If a recipient doctor chooses to continue with the telehealth referral and provide a diagnosis or management plan, they are likely under an obligation to request further clinical information from the referring doctor so as to ensure that the advice provided is accurate and clinically appropriate. In situations where accurate advice cannot be provided, it is advisable either to find another means by which more accurate information may be delivered, or to arrange in-person consultation, and only if these two options are not practicable, to provide advice with an acknowledgement of the limitations on accuracy (see discussion at 3.3).

Practitioners have varying degrees of choice over whether they provide advice regarding smartphone images. The degree of choice depends on pre-existing contractual obligations to provide out-of-hours specialist advice (i.e. “on-call” cover), the distance between locations where patients are located, and the urgency of the matter referred. If already under an obligation to provide advice in a relatively urgent matter, refusal to review the clinical images provided could arguably constitute a breach of professional

standards³⁰⁷, and may also be considered a breach of duty of care (see 3.4). For urgent matters where there is no clear pre-existing duty to the patient, there may nonetheless be a duty to “rescue” the patient by at least providing advice on the urgency of the matter, immediate steps to be taken and referral to a tertiary centre if required. If there is no pre-existing contractual duties, and the matter is not obviously urgent, practitioners who are staunchly against reviewing clinical images may best be advised to request the referrer to send them a referral letter and make an appointment to see the patient in the ordinary way. Those who do choose to undertake smartphone consultations should first ensure that remote review is appropriate in the circumstances. Further, the consultation must be performed in a thorough manner, with further information sought when required, better quality images requested when necessary and documentation of advice and follow-up plans. The clinical images must also be uploaded to the patient’s medical file. Failure to ensure the above criteria are satisfied may result in a breach of duty of care, should one be found to exist.

Institutions and employers should be aware that they may be liable for negligent conduct of smartphone consultations by staff, if they are found to owe a non-delegable duty, or are held vicariously liable for the actions of the relevant medical practitioner (see 3.4(c)). This may be true even in circumstances where a prohibitive policy against the use of smartphones is in place. Hospitals may also incur direct liability for negligently conducted smartphones where there is a failure to provide access to accurate specialist opinion out-of-hours, or a failure to provide adequate equipment to comply with hospital policy whilst simultaneously prohibiting smartphone use, if clinical images are consequently not provided for this reason. This alone should be sufficient motivation for hospitals and local health networks to urgently commence introduction of supportive software, education and guidelines for the conduct of smartphone consultations.

³⁰⁷ Health Practitioner Regulation National Law (NSW) No 86a s 139C
<https://www.legislation.nsw.gov.au/#/view/act/2009/86a/part8/div1/sec139c>

However, as outlined in Chapter 4, this process is fraught with practical difficulties.

5.5 Barriers to introducing supportive software

In order to optimise patient outcomes, practitioners require education, user-friendly technology and realistic guidelines and policy that take into account both the value and the pitfalls of smartphone consultations (see discussion at 4.4).

Education for medical students and medical practitioners is important for both referring and recipient doctors regarding capturing representative and accurate clinical images, interpretation of clinical images, consent for smartphone consultation, what is required under privacy legislation and how to utilise apps to securely transmit and upload clinical images. If high quality information in the form of online modules on smartphone consultations could be developed, this could be shared amongst Australian medical schools, colleges and workplaces, with an associated quiz to determine understanding and retention of information.

5.6 Who is responsible for enhancing the safety and accuracy of smartphone consultations?

Ideally, a standardised approach would be led in Australia by the Australian Digital Health Agency, or in New South Wales specifically, by New South Wales Health. No significant progress at the national or NSW state level is expected before 2022 (see Chapter 4.4(c)). However, many parties, including speciality colleges, hospitals and local health networks, and individual practitioners may play a proactive role in optimising smartphone consultations while they wait.

Hospitals, at the minimum, should ensure that they have infrastructure in place, such as high-speed wireless internet available throughout the hospital premises, and sufficient data storage to enable upload and back-up of clinical images (see discussion at 4.4(d)). They arguably should also introduce software that integrates with the current EMR system, however there is a risk that limited resources may be spent investigating, trialing and implementing their own systems, only to have NSW Health mandate a different compulsory system shortly thereafter.

The Australasian College of Dermatologists has the opportunity to provide leadership in improving the quality of smartphone consultations. It is in a unique position to create guidelines and education. This could be done through college education including online teaching modules (as discussed above at 4.4(e)), and lectures at annual meetings. Incentives could be offered in the form of continuing professional development points for dermatologists to engage in education and training to create safer smartphone practices. More controversially, the College could assist with attainment of critical mass of one or two apps for secure messaging amongst dermatologists and trainees by publishing minimum standards required for messaging apps, encouraging members to trial apps and to discuss their preferred software on member discussion forums.

While individual practitioners within a hospital system arguably ought not need to pay for software licences to meet their legal requirements and mitigate legal risks, this is the position in which medical practitioners currently find themselves, and failing to take such steps could well be considered unprofessional conduct (see 4.4(f)). Accordingly, until such software is provided by workplaces on a widespread basis, doctors should be proactive in trialing software and encouraging referrers to utilise that software to send images and information regarding patients, and set up their own systems for importing that information as required. While the status quo is frustrating, none of the parties

involved are powerless. Waiting on any other party to bring those changes about will not provide a defence in legal or disciplinary proceedings should a preventable error arise in the course of a smartphone consult.

Application to the wider medical profession

Although this thesis has dealt with smartphone consultations by dermatologists in Australia and the legal analysis is limited to NSW, the issues are broader, spilling beyond the confines of dermatology, beyond the borders of Australia, and beyond simple upload of clinical images. As technology becomes more complicated, the wider medical profession will surely struggle with consent, capture and storage of Google Glass footage, haptic rendering of images, artificial intelligence assessments and virtual reality assessments (see discussion at 1.4(e)). There is a need and an opportunity right now to raise awareness of the issues of privacy, consent and communication around smartphone images. The practices discussed in this paper are likely to be the vanguard of more complicated technological changes in the creation, use and sharing of medically sensitive data – so it is important to entrench appropriate methods of handling information from mobile devices while the content of those files and related processes are still relatively simple. It is the responsibility of every medical practitioner who points their phone towards a patient, the recipients of clinical photographs, their employers, their Colleges, each State government, and the Commonwealth government to understand and mitigate risks and to work towards implementing solutions that meet legal and operational requirements. Doing so now will provide a solid foundation for tackling the even more complicated technological challenges that lie ahead.

Appendix 1: Survey questions

Is your primary place of practice within Australia?

- a. Yes
- b. No [survey will terminate with the following message: *“Thank you for your interest in participating in this survey. At this time we are only collecting data relating to practitioners who primarily practise in Australia.”*]

Demographics

1. Which sector do you work in? You may select more than one.

- a. Public sector
- b. Private sector
- c. Clinical research
- d. Other (please specify)

2. Where do you work?

- a. Metropolitan centre
- b. Regional area
- c. Rural area

3. How many years have you practiced in dermatology, including dermatological training?

- a. < 5 years
- b. 5 - 10 years
- c. 11 - 20 years
- d. 20 years

4. Do you carry a smartphone with you at work?

- a. No
- b. Yes – Android
- c. Yes - iOS (iPhone)
- d. Yes - Windows
- e. Yes - other

Survey

5. How often do you take clinical photographs on your smartphone?

- a. Daily
- b. Twice per week
- c. Weekly
- d. Monthly
- e. Rarely

6. Why do you take clinical photographs on your smartphone? You may select more than one.

- a. To obtain the opinion of a colleague
- b. To monitor a patient's progress
- c. To share with other clinicians treating the patient so they may monitor the patient's progress
- d. For education of others
- e. For clinical research
- f. Other (please specify)

7. How often do you receive a clinical photograph by text or by email?

- a. Daily
- b. Twice per week
- c. Weekly
- d. Monthly
- e. Rarely

8. Who sends you clinical photographs? You may select more than one.

- a. Dermatology Registrars
- b. Dermatology Consultants
- c. GPs
- d. Emergency doctors
- e. Patients
- f. Other (please specify)

9. For what purposes are you sent clinical photographs? You may select more than one.

- a. Diagnosis
- b. Treatment recommendations
- c. Determining the order of review of inpatients
- d. Assessment of time-frame for dermatological follow up
- e. Education of others
- f. My own education or reference
- g. Interest
- h. Other (please specify)

10. How often are you provided with sufficient clinical context to feel confident in responding to a request for advice via smartphone?

- a. 75 % of requests
- b. 50 - 75% of requests
- c. 25 - 50% of requests
- d. < 25% of requests

11. If there is insufficient information in the request, how do you prefer to respond?

- a. Phone call to the sender of the picture requesting further information
- b. Text to sender of the picture requesting further information
- c. I provide an opinion with a caveat as to the insufficient information
- d. I don't respond
- e. Other (please specify)

12. How often do you use clinical photography in place of physically attending a patient?

- a. Daily
- b. Twice per week
- c. Weekly
- d. Monthly
- e. Rarely

Feel free to provide examples of situations where you find use of a smartphone is more practical than in-person consultation [open text]

13. How important is it to you, in order to manage your patients effectively, to be able to send and receive clinical photographs?

- a. Very important
- b. Somewhat important
- c. Neutral
- d. Not particularly important
- e. Not relevant to my practice at all

Please feel free to comment further (optional):

14. What method do you use to send or receive clinical photographs? You may select more than one.

- a. Text message
- b. Email
- c. Other messaging service/application (please specify)
- d. Purpose built applications for clinical photography (please specify)
- e. Skype or other videoconferencing software/application
- f. Other (please specify)

15. If you need to review advice you have provided by phone or text, where could you find a record of that advice?

- a. In a messaging app on my smartphone
- b. Elsewhere on my smartphone (please specify)
- c. In the referring doctor's notes
- d. In the patient's medical record in my workplace
- e. On my personal desktop computer or laptop
- f. On my tablet
- g. I don't record advice given over the phone

16. If you wish to review a clinical photograph at a later date, where would you find it? You may select more than one.

- a. In a messaging app on my smartphone
- b. Elsewhere on my smartphone (please specify)
- c. In the patient's electronic or physical record at my workplace
- d. On my personal desktop computer or laptop
- e. On my tablet
- f. On a cloud-based server

g. Other (please specify)

17. Does your workplace have a formal procedure or method for adding clinical photographs from your smartphone to a patient's record?

- a. Yes (please specify)
- b. No
- c. I'm not sure

18. If your workplace does have a formal procedure or method for adding clinical photographs from your smartphone to a patient's record, do you follow it?

- a. Yes
- b. No – I don't routinely add photographs to the clinical record
- c. No – I use another method (please specify)
- d. Other (please specify)

Please feel free to comment further (optional)

19. Does your workplace provide clear guidelines on the use of smartphones for clinical photography?

- a. Yes
- b. No
- c. I'm not sure

20. Are you aware of AMA's Guidelines relating to *Clinical images and the use of personal mobile devices*?

- a. Yes
- b. No

- c. I've heard of them, but have not read them
- d. I wasn't aware of them
- e. None of the above

21. Do you utilise any of the following methods to secure mobile data? You may choose more than one option:

- a. Passcode
- b. Auto-locking of phone
- c. Enabling remote deletion of data
- d. Encryption (please specify method)
- e. Other (please specify)

23. If you take photographs on your smartphone, do you routinely obtain consent for storage and transmission via your smartphone?

- a. Yes – written
- b. Yes – verbal and documented in clinical record
- c. Yes – verbal and undocumented
- d. No
- e. Other (please specify)

24. Would you appreciate further education on taking, transmitting and storing clinical photography on smartphones?

- a. Yes
- b. No
- c. Neutral

Comment (optional)

Appendix 2: Semi-structured Qualitative Interview Questions

Demographic information

1. Do you work in the public sector, private sector or both?
2. Where is your primary place of practice (major city, regional/rural area)?
3. How many years have you been practising in dermatology?

Interview

4. Who usually sends you clinical images by smartphone, and why?
5. What proportion of the clinical images you receive are solicited?
6. Do you think your ability to send and receive clinical images has an impact on:
 - a. You, and your working hours?
 - b. Your patients
 - c. Your referral base?
7. How comfortable are you providing a diagnosis on the basis of the clinical images sent to you?
8. Do you document the advice you give regarding smartphone clinical images?
9. Do you send clinical images to others? If so, for what purposes?
10. Do you have any concerns about using your smartphone to send and receive clinical images and provide advice?
11. If store-and-forward mobile teledermatology were assigned a Medicare rebate, would you undertake more of this type of work?

12. Is there anything else you would like to add?

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