

Clinical imaging: The light and dark arts of skin photography

Good clinical images require a bit more than a basic point-and-shoot approach. Dermatologist **Amanda Oakley** provides some useful tips and techniques



Continuing the theme of using a smartphone for clinical imaging, and having obtained consent for photography, we need to prepare the patient and environment for taking anatomical and close-up views.

Allow about five to 10 minutes for photography, and longer for archiving; this can be semi-automated if using a smartphone (see *New Zealand Doctor*, 22 July 2015).

Prepare the environment

You are probably in your consulting room when you decide to take photographs for clinical purposes. It is most likely dimly lit, cluttered and totally unsuitable – have a look around. It is best to find somewhere with:

- adequate wall space: optimum is 1.5m width x 2m height (Figure 1)
- a table – an alternative for imaging the arms, hands and nails (Figure 2)
- an examination couch/bed – an alternative for images of the legs and feet (Figure 3); ideally, you are able to climb up on a stool or lower the bed for a horizontal view
- no extraneous objects (eg, electrical sockets, lamps, calendars, instruments or bookshelves)
- paint, paper, cloth, drape or sheet for your background
- plain matte colour: mid-grey, sky blue, surgical green are best (Figures 1–4); black background leads to overexposure and white to underexposure of skin images, and a busy background is distracting and messy
- maximal and even lighting from above (not from a sidelight or window)
- privacy, if your patient needs to remove clothing (is a chaperone needed?).

Prepare the patient

Explain what you plan to photograph, that some clothing may need to be removed and that you need them to keep still. Make sure the patient is comfortable in the assigned position. They may need to stand, sit or lie and keep still for a few minutes.

Remove from the frame objects such as jewellery, eyeglasses (Figure 4), dirty dressings (Figure 5), unnecessary clothing, family members and furniture.

It is usually best for the patient to wear underpants, and females a bra, unless you are specifically photographing a genital or breast condition. Ask the patient to tidy a twisted strap, tuck in a label or straighten a crooked elastic band. Pin up or tuck away loose hair.

A wound or ulcer may need cleaning to remove blood, crust or adherent fibres. Remove a messy dressing from the field of view (Figure 5). Position the patient and, if necessary, straighten out your background. You could ask someone to help by holding a cloth behind your subject. Compose the shot to make sure the patient position is correct, and the background clear of extraneous objects.

Identify your photographs

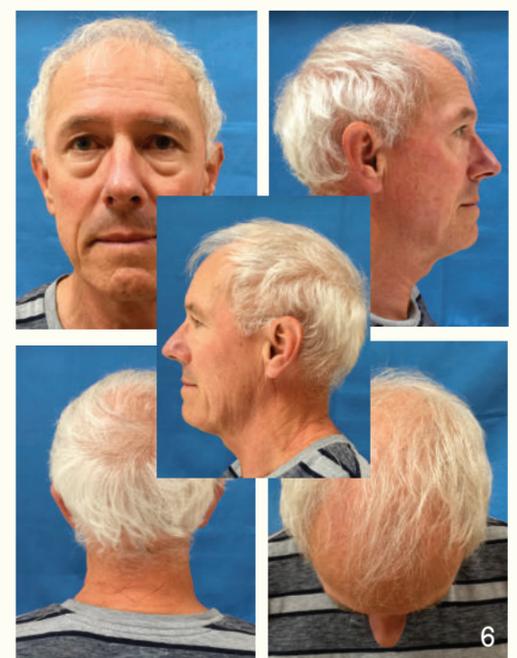
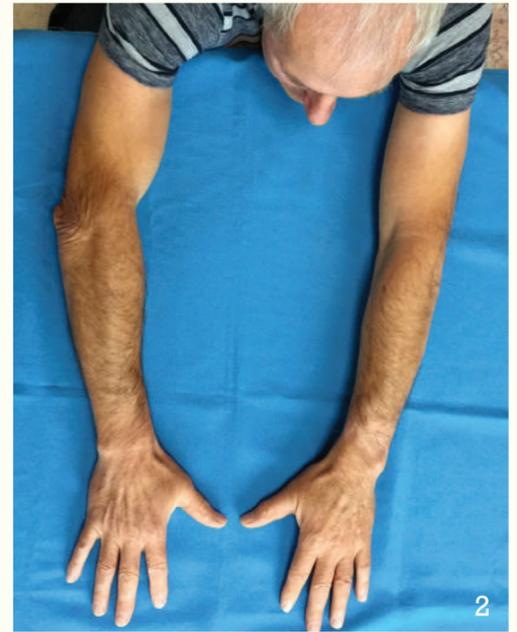
There are various ways to identify your images (eg, write it in a notebook). I photograph the consent form before or after taking the clinical images. Some photograph the patient label, but it is helpful to add the presumptive diagnosis. Others put a photographic identity sticker onto the patient, which has identity number and date.

Date is actually unnecessary, as digital images carry metadata with the time/date. Smartphone photos also include geolocation, if this is enabled, but that's more valuable for holiday shots than clinical ones.

Anatomical views

Body location images are to show the distribution, laterality and symmetry of a rash, the site of a lesion and the characteristics of the patient's normal skin

1. A plain, grey roller blind is useful as a background for the upper body
2. To photograph both arms, stretch them out flat on a table top
3. A green surgical guard can be used as background for lower legs and feet
4. Blue tablecloth taped to a doorframe (glasses should be taken off)
5. Dirty dressings should be removed and the wound cleaned prior to taking clinical photographs
6. Views of the head and neck



(eg, sun damage, multiple naevi, dry skin).

It is rarely appropriate to take a single photograph of the whole body; when a skin condition is generalised, I'll usually take multiple location pictures.

- Up to five images of head and neck (Figure 6) – front, left side, right side, back, top.
- Up to seven images of trunk – shoulders from above, anterior and posterior upper chest, abdomen, lower back, right and left flanks.
- Several images of upper limb(s) – upper arms, elbows, forearms, dorsal and palmar aspects of the hands.

- Several images of lower limb(s) – thighs, knees, lower legs, dorsal and plantar aspects of the feet.

Tips for taking good clinical images

- Take pictures with and without the flash.
- Minimise shadows by reflecting light onto the dark area using a white card (Figure 7), aluminium foil or a proprietary reflector.
- Try to photograph a flat body surface – elevate the arms to photograph the axilla, and move the patient to photograph the inner aspect of the limbs.



7. The patient holds a reflective white card to reduce shadows on the face

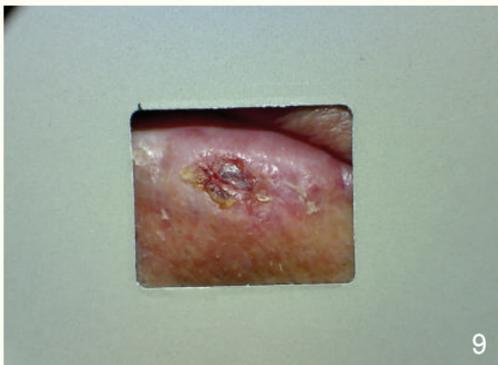
8. To photograph the soles of the feet, ask the patient to kneel, holding feet flat on the floor and close together

9. A neutral-coloured card with a hole can improve focus and exposure for a small spot and/or a sharply curved surface

10. Image taken at an angle to show elevation

11. The focus point can be moved and exposure changed by sliding the yellow square and sun, respectively, on an iPhone screen

12. The Camera+ app enhances capture and editing functions of the iPhone camera



- To photograph both arms at once, stretch them out on a table top (Figure 2).
- It is easier to photograph the plantar surfaces of the feet if the patient is kneeling (Figure 8).

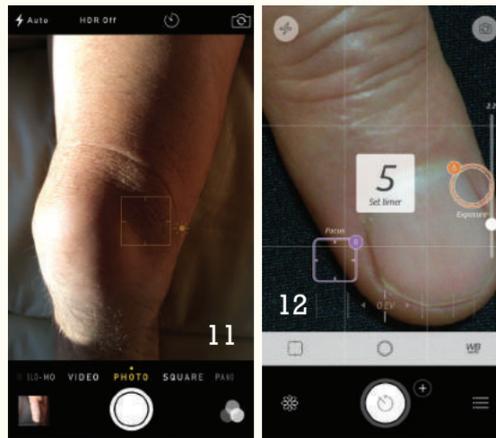
What your images should show

Think about the purpose of the image(s). Do your images clearly show:

- morphology: papules, plaques, macules, vesicles, bullae, pustules
- surface characteristics: scale, crust, excoriation
- arrangement: solitary, grouped, linear, annular, dermatomal.

Think about the *absence* of signs as well.

- If hands are involved, photograph the feet, even if clear of signs.
- If elbows are involved, photograph the knees.
- If the patient is very itchy, photograph the palms, wrists and fingers (never forget to look for scabetic burrows).



- If a flexure is affected, examine and photograph other flexures too.

Tips for good close-up images

- Skin surfaces are often curved. Reduce curves where you can, eg, stretch out a hand (Figure 2).
- Ensure the camera lens is parallel with the skin surface, otherwise areas will be out of focus.
- Keep very still: use a tripod or two-second timer.
- If your camera won't focus, figure out why. Are you too close? Is it a curved surface? Is there nothing to focus on?
- Recompose using a pen mark or clothing line.
- Try not to move as you depress the shutter or capture the image on a phone.
- If the flash causes a dark area to appear at the base of the photograph, you are too close – back up and try again.

- If the surface is curved, it is best to move back and zoom in, to improve depth of field.
- The camera may struggle with focus and exposure when you are attempting to photograph a narrow, curved area, such as the bridge of the nose, ears, lip or finger. Surround the subject with a neutral-coloured card (Figure 9).
- Avoid flash reflection: move back and zoom in, diffuse or reflect the flash away from the subject.
- To show elevation, take additional shots at an angle (Figure 10).
- Review your images, and repeat if necessary.

Tips for using an iPhone with iOS 8

- Do not add a filter (mono, tonal, noir, etc).
- If exposure shows too much contrast between dark and light parts of the image, you can set the iPhone to high dynamic range (HDR); this takes three shots at different exposures and combines the best of each.
- Move the focus point by tapping the yellow box on the screen (Figure 11).
- Increase or reduce exposure by sliding the yellow sun icon on the screen (Figure 11).
- Experiment with manual controls and editing functions on the Camera+ app (Figure 12; US\$2.99 from the App store). You can even use the iPhone's flash as a continuous fill light to improve photo quality in your macro shots.

Amanda Oakley is a specialist dermatologist practising in Hamilton at Waikato Hospital and Tristram Clinic. She is an honorary associate professor at Waikato Clinical School, and website manager for DermNetNZ.org