

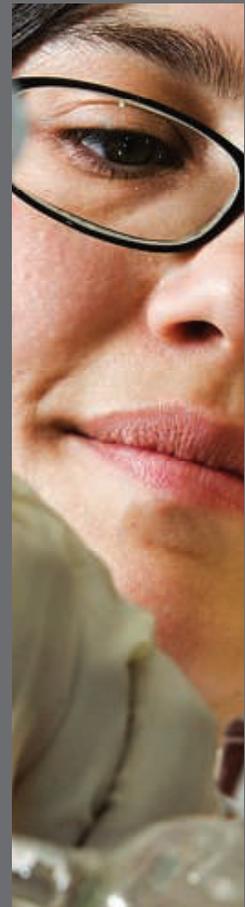
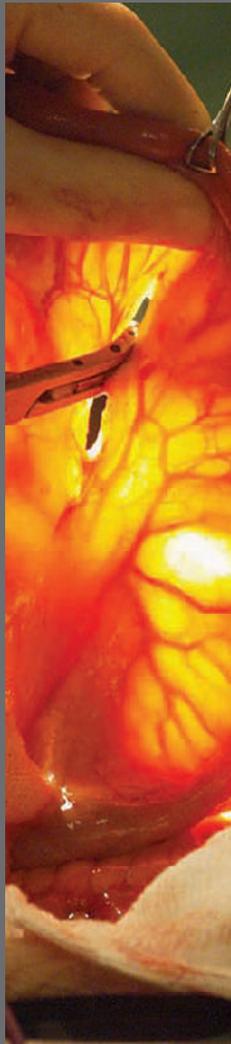


Institute of
Medical
Illustrators

IMI National Guidelines: Guide to Good Practice

Wound Management

Sep 2012



clinical photography, design and video in healthcare



IMI National Guidelines: Guide to Good Practice **Wound Management**

The IMI National Guidelines have been prepared as baseline guides on specific aspects of medical illustration activity and provide auditable standards for the future.

The Guidelines can either be implemented in full, or may be amended according to individual requirements.

Copies are available on the IMI website (www.imi.org.uk)

Introduction

Clinical photography of patients' wounds is one of several visual techniques, e.g. colour measurement, stereophotogrammetry, and thermal imaging used to assess healing.

Photography is a non-contact means of providing comparable views of the transient stages in a condition for objective assessment. By standardising photographic technique, a series of clinical photographs can be produced in which the only thing that changes within the photograph is the patient's condition.

These guidelines have been prepared for professional medical illustrators and demonstrate peer-reviewed 'best practice'.

Why might photographs be requested?

The most common reason for clinical photography is to provide a record of the natural course of, or impact of treatment on, a condition. Photographs are normally taken for the patients' case notes but may also be used for teaching, research, publication and medico-legal purposes.

With modern photographic equipment, almost anyone can achieve a sharp and correctly-exposed photograph. The value of clinical photography in wound management lies in the ability to achieve repeat views over time. Standardisation is critically important because accurate serial photographs mean that images (and therefore progress of the condition or healing) can be compared objectively over a period of time. This can be difficult to achieve where wounds, such as pressure ulcers, develop on curved areas of the body and may be deep and irregular in shape. For this reason whilst standardised photography can provide a useful objective record, it is not accurate enough to be used as a basis for measuring wounds.

Wounds can develop in any area of the body and vary in size and depth ranging from small areas of localised skin damage through to large and deep wounds extending to muscle and bone. These guidelines recommend minimum requirements for clinically photographing patients' wounds.

The Request

Medical Illustration Departments will provide the best clinical photography in wound management as they have professionally-qualified staff trained in the production of accurate clinical records. However, it is acknowledged that other healthcare professionals managing patient's wounds might also be involved in recording the clinical progression of these patients, often outside of the hospital environment. Since the resulting images are frequently required for medico-legal purposes, using these guidelines to ensure accurate practice is essential.

Where other healthcare professionals are required to take clinical photographs they should contact their local Medical Illustration Department for advice about equipment purchase and basic photographic techniques.

Consent

(See IMI National Guidelines on Patient Consent)

Local Trust Policy relating to Patient Consent to Treatment must be followed.

Current legal opinion recommends that written informed consent should be obtained from patients prior to any imaging. If the patient consents verbally, but is unable to write, this should be recorded in the case notes.

If the patient is not competent to consent (such as vulnerable adults including the elderly, the disabled, people with learning disabilities or mental health problems) then the most senior healthcare professional responsible for the patient may authorise the form if clinical recording is demonstrably in the best interests of the patient. The resulting photographs must be used for clinical purposes only.

Consent from carers or relatives is not essential. However, it is good practice to seek the views of someone close to the non-competent patient to help determine their best interests.

Patients over 16 years old can give their own consent.

Children under 16 years old can provide consent if they are judged to be capable of giving consent and fully understand the procedure.

Paediatric Non-accidental Injuries (see IMI National Guidelines for NAI)

Ideally, parental consent should be obtained; however clinical photography may be authorised by the most senior healthcare professional present if it is demonstrably in the patient's best interest. This should be documented in the case notes.

Photography should not be forced upon anyone against their will. A patient's refusal to permit any level of recording should be respected even if such refusal may prejudice their care. Anonymising a patient's photographs does not preclude the need to obtain informed consent.

Where the clinical images are to be used as part of a clinical trial, specific information about their limits of use should be explained to the patients prior to taking part and should form part of the written consent documentation.

Preparation

Extraneous clothing should be removed by the patient (or carers). Often wound photography involves the sacral and genital areas and it is preferable to remove briefs, but the patients' dignity should not be compromised.

Standardisation

The essence of good clinical photography lies in ability to make objective comparisons between clinical images taken over a period time and controlling all possible variables (equipment and procedures) involved in the production process. This is particularly important when photographs may be used as evidence in court although in difficult circumstances, an imperfect recording will be preferable to having no record at all.

Standardisation is achieved by careful control of equipment, materials, lighting, viewpoint, background, technique and post-production. Whilst excellent results can be obtained using film-based cameras, digital working enables all processing to be undertaken in-house. It is assumed for the purpose of these guidelines that digital camera equipment will be used.

Location: For infection control reasons, most wound photography takes place on wards, in clinic areas, and for those patients managed by community staff, in patients' homes. The exceptions are when photographing patients with healed wounds, which may be recorded in the photographic studio. In these instances, it may be preferable to use hand-held flash to mimic portable lighting previously used in the ward or clinic.

Equipment: A 35mm digital single lens reflex is the camera body of choice. This should be used with fixed focal length lenses with integral macro facility such as 60mm, 90mm or 100mm. For close-up photography, the ability to photograph subjects at 1:2 magnification is useful. This will be possible with most long focal length lenses whereas some will require additional extension tubes. (Non-clinical photographers see Appendix 1 for a suggested equipment list.)

Mobile telephones should never be used for clinical photography because the process involves unacceptable risks to the security and confidentiality of the images and there is the potential for legal action to be taken against an individual clinician or organisation, if a patient's privacy or rights were to be compromised.

Equipment should be transported in hard cases, which must be regularly cleaned to prevent cross-infection from ward to ward. Some patients will be identified as requiring special infection control precautions; local policies should be followed.

Lighting – on Location: For general recording of wounds create even, repeatable, lighting by placing a portable electronic flash over the lens or as close to the lens as possible. This will provide effective lighting and control unwanted shadows. It is important that the quantity and direction of light falling upon the subject is carefully controlled.

For recording cavities, a ring-flash may be necessary although this can result in an overly flat image. The addition of masking on the ring-flash may achieve better modelling. Careful notes should be made in order to enable repeat photographs to be taken.

Lighting – Studio: It may be preferable to use the hand-flash, as on location, in order to mimic the lighting previously used on the ward or clinic area.

Background: Backgrounds should be plain and unobtrusive providing no distraction from the area of interest. On location it is recommended that a disposable sterile green cloth is used (ideally blue or green) and left on the ward/clinic area for disposal. The cloth should be placed in contact with the patient in order to minimise any shadows. If blue/green cloths are not available then plain white bed sheets are readily available on wards but care must be taken to minimise any lighting flare.

In the studio environment backgrounds are more easily controlled and a neutral backdrop such as black or white is preferred.

Viewpoint & Technique: It is helpful to view any previous images (and their photographer's notes) in an effort to achieve repeat views. The most difficult variable to control is the patient's position. When photographing wounds over heels and elbows care should be taken to ensure that the patient is being photographed from the same side as the previous images.

A good starting point is for the patient to be comfortably positioned in the correct anatomical position.

The camera should be held perpendicular to the wound.

It may be easier to photograph the patient lying down because some wounds (particularly those on the buttocks) distort easily and slight movements such as the flexing of a muscle or a slight change in the patient's position may significantly alter a wound's appearance. Additionally, the natural curvature of the patient's body can be an issue especially where wounds extend around a limb e.g. pressure ulcer on the heel or elbow. It may be helpful to photograph such wounds in a 'relaxed' position and then again with assistance by nursing staff.

Avoid including any hands in the image wherever possible. Where this is necessary, hands should always be gloved.

In general, wounds and the surrounding area (particularly the perineum) should be cleaned before photography; otherwise there may be confusion as to the condition and extent of the wound. Sometimes, for teaching purposes, wounds are recorded pre- and post-cleaning or debridement – for example, in the recording of burns, which may be photographed before and after the blisters are removed.

Views: A general establishing shot of where on the body the wound is located including a wide area of healthy tissue.

Separate close-up shot(s) to show the detail with and without scales.

Disposable paper scales are often supplied by pharmaceutical companies as marketing tools and are of limited value but can be useful to give an impression of the extent of a wound, particularly over large curved surfaces. However, rigid scales are preferred to flexible ones. They must be placed in the same focal plane as the skin since only this section will be in focus and therefore of any value as a measurement tool.

The ABFO#2 (American Board of Forensic Odontology) scale is recommended although it may be necessary to use disposable scales where there is an infection risk.

Where colour is an important factor, it is useful (where practicable) to include a calibrated colour chart and/or grey card in the frame or at the beginning of a series of images. These will provide a consistent reference point for minor adjustment of clinical image processing and viewing.

The photographer should make notes of the views taken; equipment used, scales and exposures, date and time of photography. Most digital cameras automatically record this information within the image itself and this can be transferred to a consent form or image database. If possible, details of any chaperones and nursing staff present should be recorded, particularly in cases of NAI.

When re-photographing patients, the desired magnification should be pre-set on the focusing ring of the lens and the camera moved until the area of interest is sharp.

If a wound is located in an awkward position it may be helpful to use a large dental mirror, which should be cleaned and sterilised before and after use. Mirrors should be positioned at 45 degrees to the subject and the camera positioned at 45 degrees to the mirror (resulting images should be reversed so that the wound is seen normally).

Colour control: All cameras, monitors and printers have their own colour characteristics and each will capture or display colour slightly differently. Effective colour management and control within a workflow enables photographers to achieve more consistent results.

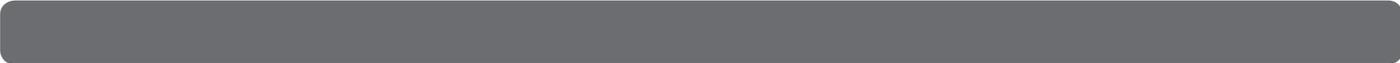
Amateur working – where non-professional photographers are photographing patients, the workflow may be restricted by the choice of equipment and expertise. There will be little or no control over resultant image type and colour management when using fully automatic point-and-shoot cameras. At the very least, lighting should always be with the camera's flash (never using the ambient lighting in the room) and the camera's white balance setting should be on 'Flash'.

Professional working – professional clinical photographers should adopt a RAW workflow to enable the use of a calibrated colour chart (e.g. X-Rite, QP Card, or similar) or a neutral grey card (e.g. X-Rite, Whibal, among others) in the frame or at the beginning of a series of images. These will provide a calibrated, or at least consistent, reference point for minor adjustment of clinical image processing.

Additionally, in order that clinical images can be edited in a colour managed environment, monitor calibration is the first step to controlling colour in a digital workflow and representing colour as accurately as possible. It serves two main purposes; a) it permits photographers to edit images with confidence because the colours displayed on the screen are an accurate reflection of the file and b) it can help ensure that the colour values seen on screen closely match output. There are a number of ways that this can be achieved and monitors and output devices should be calibrated regularly and appropriate colour spaces selected.

Processing: Any image processing after photography should follow a defined, written local protocol, which will form an audit trail. This is essential if the images are to be used in a medico-legal context.

Digital image files should be downloaded from the camera card to computer where they should be uniquely labelled and named as soon as possible.



Information such as job number, date and patient's hospital number should be recorded as a minimum. It is good practice to save two copies of RAW unmodified files (which are considered as originals and are admissible as evidence). The first copy should be archived and stored in a secure place for later retrieval. The second copy will become the "working copy" and minor processing such as adjustment of levels; sharpening and colour management should be undertaken before inclusion in the patient's medical record or upload to an image database.

Storage: Photographs form part of a patient's medical records and must therefore be securely logged and stored according to local Case Note Policy. Photographs are also subject to The Data Protection Act 1998 and must be available for disclosure in response to any request made by or on behalf of the patient.

Presentation of Images

This should be by local agreement although it is desirable to move towards an electronic record in the form of a secure digital image database that can be shared across the health team.

Conclusion

Clinical photography of patients' wounds is useful in providing an objective assessment of wound healing. Appropriate choice of equipment and technique will aid standardisation, which is the key to successful wound documentation.

Potentially, any clinical image may be required in a medico-legal context. Therefore it is necessary to ensure that local procedures for clinical photography and image management are standardised and documented.

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Appendix 1

These are suggested camera kits suitable for non-clinical photographers producing basic clinical photographs. Optically there is little difference between the major manufacturers and choice is very much a personal preference.

Prices are approximate, include VAT and were correct as of August 2012

- 35mm Digital Kit
- SLR digital camera body
- Macro Lens of fixed focal length(60mm F2.8 provides 1:1 close up)
- Dedicated flash light
- Memory card Sandisk
- Case Aluminium hard case
- Total cost approximately £1000.00

Compact Cameras

The use of compact cameras with built-in lenses and flash are of limited use and are not recommended for clinical photography as they do not offer sufficient control of the variables necessary for effective medical photography i.e. standardised focal length, good macro (close-up) capabilities, white balance, and image management. However it is acknowledged that in some circumstances, a non-standardised recording of a transient condition will be preferable to having no record at all.

For staff requiring a compact camera for monitoring healing and the state of the wound bed, both Canon and Nikon produce good compact cameras. In the Nikon Coolpix range, the current models (late 2012) include the P300 at around £250 and the P7100 at around £325. Canon produce the G-series (currently the G12 and the G1-X) at over £400 and the S100 compact at around £345. Since models are superseded quite rapidly, current models, prices and capabilities should be checked before purchase.

One of the prime considerations for compact cameras is the minimum focusing distance at full telephoto. In order to achieve a close-up view of a lesion with the camera at a safe working distance, the camera should be able to focus sharply at 12–18 inches in macro mode with the lens at maximum optical zoom. All photography should be undertaken with the camera's flash switched on and the white balance set accordingly, so that consistency in the colour of the illuminating light is achieved.

In all cases, it is advisable to seek advice and training to ensure that the best possible images are achieved. Contact the author for advice in seeking such training.

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Guidelines issued: September 2012. Review date: September 2015