



Original communication

Focussing on the future: Survey results on the image capture of patterned cutaneous injuries



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ABSTRACT

An investigator who is involved in assessing the likelihood of physical abuse must make a decision as to whether the injury seen matches the explanation given. In some instances the pattern of these injuries can give the investigator a possible link to the cause of the injury. Photographic imaging is used to record the patterned cutaneous injuries (PCI) and to facilitate forensic interpretation. The current method of capturing PCI often results in some form of distortion that causes a change to the shape of the patterned injury. The Dermatological Patterned Injury Capture and Analysis (DePICA) research group was formed to assess current image capture methods and practices. An online survey was set up to assess the value of localised imaging protocols and training specific to imaging PCI and was made available to law enforcement professionals, forensic investigators and hospital staff. 80 participants responded to the survey. The majority of the survey participants have had training in medical or forensic photography, however 66 (83%) have not had specific training in how to photograph PCI. 41 (51%) of the participants responded that they always use a rigid scale and 34 (43%) position the camera so that it is perpendicular to the scale and injury. Comments made about the quality of images obtained and produced raises concerns about how much knowledge those initiating such images have about image relevance in criminal cases. It is evident that a clear and comprehensive guide to photographing PCIs is required to improve the quality of the photographic evidence that is collected.

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1. Introduction

The Dermatological Patterned Injury Capture and Analysis (DePICA) research group, comprises multi-professional collaborators from a wide range of backgrounds, including the Metropolitan Police Service (MPS), the Home Office Centre for Applied Science

and Technology (CAST), the National Injuries Database at the National Crime Agency (NCA), Barts and the London School of Medicine and Dentistry, Expert Forensics Ltd, and Cardiff University Schools of Medicine, Dentistry, and Mathematics. It was formed in March 2011 funded by the Children and Young Person Research Network (CYPRN)¹ The DePICA has two main research aims: 1) to assess current image capture methods and practices and 2) to produce guidelines for best practice. This paper addresses the first aim.

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Patterned cutaneous injuries (PCI), such as bruises, bite marks, and other visible marks on the skin, usually occur when the body has been damaged by external trauma. Many factors influence whether trauma leaves marks of injury or long-term marks or scars. In cases where these injuries are intentional or there is the possibility that they are non-accidental, appropriate recording for evidential purposes may be crucial in subsequent court cases. When such injuries are patterned, they may have features or configurations that may be indicative of the implement used, or the physical contact surface of a perpetrator. Such patterns are not always recognisable at the time of the initial investigation, and subsequent information about the nature of implement and causation may then corroborate evidence or reveal the true cause.

Good quality images can capture the appearance of an injury and can be used for evidential purposes^{2–4} to facilitate discussion of the injury in audit and peer review, strategy and case conference meetings, and within the court setting. In addition, recording the accurate shape, size, colour, and position of a patterned injury can be of forensic significance^{5–12} and may enable comparison of the pattern of the injury to the contact surface shape of the implement. The outcome of this analysis, in terms of admissibility as evidence, can depend upon how well these patterns are reproduced with digital photography. Factors such as lens and angular distortion, sharpness of focus, exposure, contrast, colour representation and digital artefacts can all affect the standard of image quality and may not be recognized by some of those working within a forensic setting.^{13,14}

Guidelines for the imaging of bite marks have been made available by the British Association of Forensic Odontology (BAFO) and the American Board of Forensic Odontology (ABFO),^{15,16} and image capture literature has previously been produced by National Policing Improvement Agency (NPIA) the Home Office, and the Federal Bureau of Investigation (FBI).^{17–19} However, at the time of writing, we are not aware of any published protocols specific to the imaging of PCI pertaining to inflicted or non-accidental injury.

A recent study has shown that many images of PCI that are taken for both documentation and forensic purposes are of inadequate quality to yield successful forensic analysis results.²⁰ Problems may relate (amongst others) to poor focus, poor lighting, poor framing and lack of rulers or colour scales. This is largely due to the range of image capture techniques used, the range of individuals taking the images and the lack of any standardised imaging protocols.

The aim of this study was to document the current imaging practice of PCI, by taking a broad range of practitioners involved in such work including professional (forensic and medical photographers) and non-professional photographers (crime scene officers (CSOs), medical and forensic practitioners).

2. Methods

An online survey was created to assess the value of localised imaging protocols, training specific to imaging PCI the current procedures used by photographers and the consequent standard of images produced. In addition, the participants' knowledge of image quality and its importance in terms of documentation and potential forensic analysis were also evaluated.

The survey was aimed at a broad sample medical and forensic practitioners who regularly partake in the photography of injuries (capture and/or viewing of images). The survey questions were compiled by consensus by the members of the DePICA collaborative research group. It was deemed important that the survey should be concise quick and easy to answer direct questions. It included closed multiple-choice questions with the option to comment to maximise information capture. Specific questions were directed at respondents who review images within their professional practice and others at photographers themselves.

The survey was built using Google Documents and was disseminated electronically over a ten week time period (February 23rd–May 7th 2012) to Scientific Support Managers (SSMs), Forensic Practitioners, and Child Abuse Investigators across the UK. A reminder to complete the survey was sent in April 2012. The survey link was made available to potential responders via specialist web-sites, Child protection communities, the Institute of Medical Illustrators group and distributed to members of the Royal College of Paediatrics and Child Health (RCPCH) in their monthly college e-bulletin.

The results from the completed surveys were downloaded into Microsoft Office Excel and PASW Statistics v18 for analysis. The raw data compiled in Google Documents is available online on contact with the corresponding author. The percentages are rounded up to the nearest whole number.

3. Results

A total of 80 survey questionnaires were completed and analysed.

Table 1 shows that $n = 69$ (86%) respondents considered photography essential when investigating a cutaneous injury suspicious of abuse. A further $n = 10$ (13%) stated it was worthwhile.

$n = 76$ (95%) of respondents stated that they were, or had access to, a professional photographer or camera competent officer. Of these, $n = 57$ (71%) stated that there are occasions when a professional photographer is not available. Appendix 1 gives some examples of such reasons of which 'staffing issues or 'no out-of-hours service' were most common. Some selected comments from Appendix 1:

3.1. Reasons given for non-use, non-availability of photographer

3.1.1. Respondent – POLICE PHOTOGRAPHER

"We have 24/7 availability of CSI's and Photographers, it is not unusual for officers to photograph injuries using camera phones... quality is poor and close-up photography is generally blurred with little definition. At some Senior Officer level, there is a belief that everyone carries a camera on their phone and so why do we need more expensive cameras and a professional behind it !"

3.1.2. Respondent – CRIME SCENE OFFICER

"Not used because untrained constables with a point-and-shoot camera think their blurry efforts are sufficient."

3.1.3. Respondent – REGISTERED MEDICAL PRACTITIONER

"The hospital team work 9-5 M-F. Police photography will only be used in cases of severe injury. Therefore, minor injuries which may be possibly abuse that come to hospital on week end will not be photographed until Monday, by which time appearances may have changed. Hospital staff are advised not to photograph injuries themselves".

Table 1

The relevance and frequency of photographing Patterned Cutaneous Injuries (PCI).

"When an individual has an injury, and physical abuse is suspected, how do you consider photography?"	Essential	69 (86%)
	Worthwhile	10 (13%)
	No preference	1 (1%)
	Unnecessary	0 (0%)
	Undesirable	0 (0%)
How often do you photograph visible injuries in suspected physical abuse	Always	40 (50%)
	Usually	35 (44%)
	Sometimes	4 (5%)
	Rarely	1 (1%)
	Never	0 (0%)

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