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Project: Measurement of 2D wound images - Use of PAPRIKA (pairwise ranking) to develop consensus and consistency around wound image informatics and reporting

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Sponsor: Diabetes Christchurch (Don Beaven Summer Studentship)

Introduction:

Skin ulcers and wounds are common and have immense social and economic impact (Sen CK, Wound Repair Regen 2010). Photographic imaging plays an important role in the diagnosis, clinical management and record keeping of these wounds.

There are many technologies that enable clinicians to take, share and store images, together with 2D and 3D wound metrics. It is essential that the collection and reporting of images is standardised as this will allow effective communication between all of its users. However, technology uptake is patchy and technology is evolving rapidly, so not surprisingly the technology lacks standardisation.

This presents an opportunity to identify what clinicians want from this technology and how they would prefer to better incorporate it into their clinical practice in the near future. Identifying clinician preferences at this early stage of clinical uptake should help shape the future development of imaging technologies themselves.

This pilot study was initiated by the Canterbury District Health Board's Diabetes team, as wound care (specifically diabetic foot ulcers), is a major part of their clinical workload. This group are confident users of wound imaging technology (ARANZ Silhouette®) and were happy to share their experiences.

Aim:

The project aimed to lay a foundation for the standardisation of wound imaging data acquisition and reporting, by identifying clinician preferences. This was assessed using a pictorially based questionnaire covering wound imaging methodology and associated metrics.

The initial aim was to use a pair-wise ranking approach for statistical inference but this has not yet been achieved. Instead, the questionnaire was structured in part, to test whether pair-wise ranking might be possible for a future extension of this project.

Method:

Step one was an extensive literature search. Papers were available that analysed the implementation of wound imaging technologies in healthcare facilities. Other papers assessed the quality of wound imaging tools.

Guidelines for optimal photography of wounds were also found. However, we found no papers that were directly relevant to clinician preferences around wound imaging.

Step two involved interviews with image users to identify how they currently use wound imaging. We discussed use in clinical practice with a range of clinicians and asked them about preferences for future technology and possible setbacks that might present themselves in relation to wound imaging technologies.

We also interviewed wound imaging industry representatives, to understand important features of current technology from their perspective as well as identifying how imaging technologies of the future might operate.

The industry is always eager to better understand clinicians' preferences. They were also able to supply us with additional potential questions for our survey.

Step three involved collating information from these interviews, to design a mixed methodology (both qualitative and quantitative) pilot questionnaire, aimed at clinicians who looked after skin ulcers.

This questionnaire was in two parts. Part one asked about the methodology of wound imaging. For example:

- The type of device they preferred
- How they preferred to attach the images and metrics to patient records,
- How they preferred to trace the wound margin image to calculate wound metrics etc.

Part two of the questionnaire asked about interpreting the metrics that can be provided with wound photos. For example:

- Did participants prefer a graph that showed absolute wound area changes over time or one that showed changes that were relative to the first image measurement?
- How did participants prefer for external clinical information to be provided?

Doctors, nurses and podiatrists were approached to complete the questionnaire, with the aim of getting 20 responses.

Results:

23/24 clinical staff approached to complete the questionnaire managed to do so. We were surprised to see how many of the questions generated a preferred option, agreed upon by most participants. 12 out of the 13 questions had one option that clearly was more popular than the rest.

The question that divided opinion related to patient consent for photos that had the potential to identify the patient (For example, by showing their face.)

- 45% thought verbal consent was sufficient
- 36% thought getting the patient to sign an e-document on a tablet was the best approach (assuming that this technology was available).
- The remaining 19% either preferred written consent on a paper document or had no preference.

Current technological limitations require clinicians to make trade-offs. The trade off most preferred by clinicians was accurate metrics, with a good image quality, rather than excellent image quality with poor metrics.

Conclusion:

This pilot questionnaire provided insights into clinician preferences around wound imaging systems, an area in which there is no previously published research.

We believe it is important to standardise wound imaging on a national level, not just within Christchurch Hospital. We therefore plan to use information from this pilot study to develop national level surveys.

This research has the potential to shape wound imaging technology to better fit the preferences of the clinicians who will use it. This will, in turn, help allow wound imaging to reach its full potential, improving the efficiency and effectiveness of patient care.