

Burn patients benefit from revolutionary 3D imaging technology to treat wounds

The technology solution using 3D imaging software and an Intel 3D RealSense camera integrated into a Panasonic Toughpad tablet has the potential to improve patient care and reduce the £5 billion impact on the NHS of treating wounds and ulcers.

A consultant surgeon in Burns and Plastic Surgery is pioneering revolutionary new technology to help treat patients with wounds using 3D imaging software that runs on rugged Panasonic Toughpad tablets and has been developed by Swansea-based health informatics company GPC.

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Professor Jeffery, Director
of the UK's National
Institute for Health
Research WoundTec
Healthcare Technology
Cooperative



Professor Steven Jeffery is using 3D WoundCare to assess the size of burn injuries and monitor the progress of patients' traumatic wounds when they are being treated at the Burns and Plastic Surgery Department of the Queen Elizabeth Hospital in Birmingham. The wider management of wounds in the UK, such as burns and pressure ulcers, presents an enormous challenge to the NHS. Currently costing an estimated £5.3 billion and involving over 40m clinician visits a year, Professor Jeffery believes this new technology has the capability to radically improve care and reduce treatment.

The solution easily captures and accurately measures a 3D image of any wound or ulcer using a photo taken by the Intel® RealSense™ 3D camera integrated into a Panasonic Toughpad FZ-M1 tablet. The new system is far faster and more accurate than traditional methods.

Professor Jeffery explained: "Over the past few years several handheld devices have been developed to measure wound area and volume. I helped design one of the first 3D cameras, but the early systems were limited because they were too awkward to use routinely. I was therefore very excited by the prospect of helping to develop software that could be used with a familiar hand-held device, such as a tablet."

Assessment of a wound and its subsequent documentation are essential components of patient care. Wound assessment enables the clinician to identify the correct treatment or intervention needed to help the wound heal. Subsequent re-assessment enables the clinician to identify the progress made. However, despite the considerable financial impact wound care can have on health-care budgets, the monitoring of wound healing and management of wounds was previously largely reliant on somewhat subjective measurements and observations.

Traditionally, assessment has been carried out by visual examination and recording these findings in the clinical notes. Wound measurement techniques included using rulers or calipers, tracing the wounds or 2D photography. The first two techniques required contact with the wound surface, which can be painful for the patient, and can also be difficult to repeat and calibrate accurately.

"The ability to determine the size and depth of a wound without having to actually touch it is very useful to both the clinician and the patient," said Professor Jeffery. "Best practice dictates that wound length, width and surface area should be recorded, and be repeated at subsequent dressing changes. The camera, tablet and software makes this much easier."

Estimating the size of a burn was previously performed by various different methods such as the "Rule of Nines", where the body is broken down into 9% areas (such as an arm = 9%), or the "Rule of Palm" where the size of the patient's palm is roughly equal to 1% of the total body surface area. These techniques are often imprecise because of the variability of the human body. The use of the 3D camera and software makes the determination of burn size much easier and leads to more accurate, reliable and repeatable measurements.

Assisting burn patient recovery

In the case of burn patients, the early and accurate assessment of wounds can be very important in limiting the skin damage caused by



Opportunity for the wider NHS

Professor Jeffery, who is also the Director of the UK's National Institute for Health Research WoundTec Healthcare Technology Cooperative, has recently published a paper on his experience of using the solution and envisages the wider NHS and other centres around the world also adopting the technique.

"The potential for cost savings by changing interventions earlier, reducing dressings and clinical resources and delivering better patient outcomes will be significant," said Professor Jeffery. "Further cost savings could result from remote monitoring and diagnosis of wounds in the community."

"The camera, tablet and software is simple to use, and any clinician can be trained to use it, with very little experience in burns or wound care required. It is a cheap and efficient adjunct to training a doctor, nurse or paramedic to assess the size of any wound including burns. We also feel this has significant implications for assessment in the Emergency Department, in military medicine and in pre-hospital care."


The technology behind the solution

Panasonic is one of the first companies to offer the option of an integrated Intel 3D camera. Its latest Toughpad rugged FZ-M1 tablet has improved communications and performance capabilities alongside the optional 3D camera powered by Intel's RealSense technology. The RealSense™ camera has three lenses; conventional, infrared and infrared laser projector. Together these three lenses allow the device to infer depth by detecting infrared light that has bounced back from the object in front of it.

The powerful 3D WoundCare software uses the image to transform wound-related care. With simple interfaces to Electronic Medical Records systems and GP systems, clinicians can:

- Review, create and edit patient and wound assessment information, with appropriate audit trails
- Generate an audit log of activity related to the wound. Images and video cannot be altered, providing a robust record of the wound being assessed
- Review data captured by point-of-care devices to monitor assessment activity and quality
- Review images, measurements, clinical notes and graphs of wound healing progression to track healing progress and identify areas of concern
- Automatically generate .pdf format Wound Assessment Reports at the touch of a button for better communication with specialists, management, commissioners, patients and other stakeholders
- Remote and mobile wound surveillance at home, at clinic, or at the specialist's office.

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