Healthcare Innovations
How practice has changed

HERSTON HEALTH PRECINCT SYMPOSIUM 2021

DISC-0027

6 - 10 September 2021
Education Centre
RBWH

Application of 3D scanning technology in radiation oncology

S Crowe [1,2,3,4], J Luscombe [1], T Poroa [1], S Maxwell [1], S Cleland [5], T Kairn [1,2,3,4]

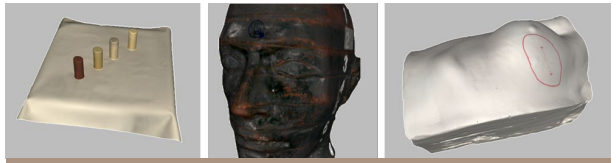
1. Cancer Care Services RBWH. 2. Herston Biofabrication Institute. 3. University of Queensland, 4. Queensland University of Technology. 5. Metro South

Purpose

Patient-matched medical devices are used in the treatment of superficial disease in radiotherapy. They include shielding (to decrease healthy tissue dose), bolus (to increase skin dose), and applicators and templates (to position the radiation source).

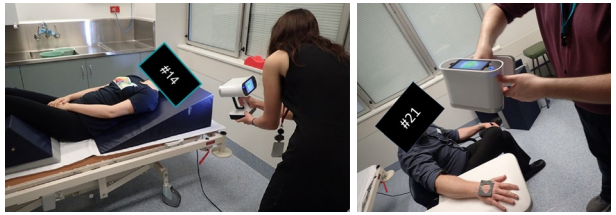
Historically these have been made manually by patient moulding. 3D printing allows them to be made from computerised models. 3D scanners are a potential safe, cost-effective solution to obtaining those models.

This project aimed to characterise the clinical suitability of 3D scanners for radiotherapy devices, and to develop a clinical workflow for our patients.



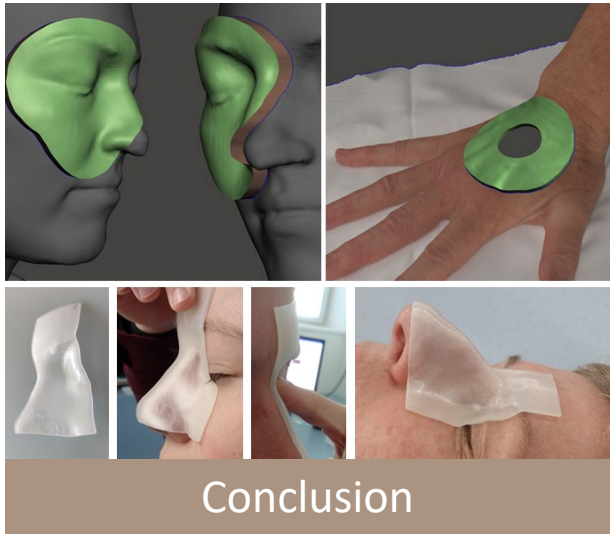
Method

The 3D scanner was commissioned by scanning objects of known sizes, and variable shapes, surfaces, and colour tones, and checking results. We then acquired 173 scans of 26 volunteers, in different positions. The volunteers had self-reported variations in skin and hair tone, height and weight. Thin "shell" devices were prepared for volunteers.



Results

The mean scan time was 3 minutes. The scanner was easy to use, and produced sub-millimetre accurate 3D models of participants. The test devices produced using the models fit participants with minimal air gaps present, ensuring accurate delivery of the therapeutic dose of radiation.



Conclusion

An alternative to the existing use of CT imaging for device design was developed, and has subsequently been successfully used within Cancer Care Services in the preparation of a radiotherapy treatment.

Griffith University Queensland, Australia · Menzies Health Institute Queensland · QIMR Berghofer Medical Research Institute The Future of Health · pathology queensland · QUT · The University of Queensland Australia Create Change · Herston Health Precinct · RBWH Foundation · Metro North Health · Queensland Government