

Reduction of motion artefacts for 4DCBCT



THE UNIVERSITY OF
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Digital Imaging - Oncology



> TRL 2-3
> Preclinical

Problem

In radiotherapy the use of breath-hold techniques such as deep-inspiration breath-hold or abdominal compression is needed to reduce breathing-motion and more importantly reduce the dose to organs-at-risk (regions includes thorax, abdomen and breast).

These motion management techniques are required to reduce erroneous targeting of treatment beam that could lead to severe patient side effects. Current AAPM clinical and ESTRO ACROP guidelines recommend such techniques to manage motion but may lead to significant tumour motion during treatment. Additionally, not all patients are suitable for abdominal compression techniques.

Solution

For radiation therapy, the new generation linear accelerators can deliver rapid imaging and rapid radiation for patients. However, this could also lead to patient side effects as the dose is delivered faster than conventional linear accelerators leading to erroneous targeting of the treatment beam.

This invention aims to significantly improve the image acquisition process using a new reconstruction method for new generation linear accelerators with rapid acquisition protocols.

This will potentially allow for more accurate treatment for patients undergoing radiotherapy who cannot tolerate abdominal compression techniques.

Intellectual Property Status

Provisional patent application, AU/2024/900747 has been filed.

Potential Commercial Applications

- Integration with standard linear accelerators in clinical settings
- Improve radiotherapy outcomes

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