AI IN ADAPTIVE RADIOTHERAPY

MEDICAL FIELD, OR MEDICAL METHOD
Radiotherapy

TYPE
☐ Decision support ☐ Autonomous decision making

CATEGORY
☐ Prevention ☐ Detection ☐ Diagnosis ☐ Treatment
☑ Other

DESCRIPTION
AI segmentation module integrated in adaptive radiotherapy treatment planning and delivery system.

AIM / PURPOSE
AI detection of anatomical structures of great impact on radiotherapy target shape and position speeds up the creation of a treatment plan adapted to daily anatomical changes.

OUTPUT / RESULTS
Daily adaptive therapy is feasible within same session time as conventional treatment.

Successfully tested for male and female pelvis and abdomen. Other treatment sites under development.

AI METHODOLOGY
Modified U-Nets (convolutional deep neural networks) trained with hundreds to a few thousands clinical images with curated ground truth organ contours.

INPUT / SIZE OF THE DATA
Cone beam CT images of adult patients

REFERENCE DOCUMENTS / LINKS / PUBLICATIONS
Haensch A et al (2018) Deep learning based segmentation of organs of the female pelvis in CBCT scans for adaptive radiotherapy using CT and CBCT data. International Journal of Computer Assisted Radiology and Surgery. pp 179–180
http://dx.doi.org/10.1007%2Fs11548-018-1766-y

SOURCE
Varian

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