X-Line™
Radiopaque Adhesive

For radiotherapy, X-Line™ allows for easy and accurate body contouring of CT images within the extended field of view.

"**X-Line** allows for more accurate delineation of the external body contour in the extended field of view (eFOV) by simply connecting the dots on the CT image."

Dr. Kirpal Kohli, Medical Physicist BC Cancer Agency

The following CT simulators are most affected

GE Lightpeed RT and Siemens SOMATOM RT series models need X-Line to treat obese patients

Three radiopaque lines on an adhesive

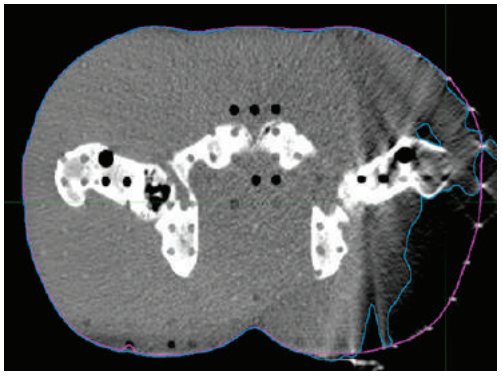
The lines are spaced 1" apart on a transparent skin adhesive roll with perforations every 2".

Adhere to regions that may fall within the eFOV, orienting the lines along the patient longitudinally.

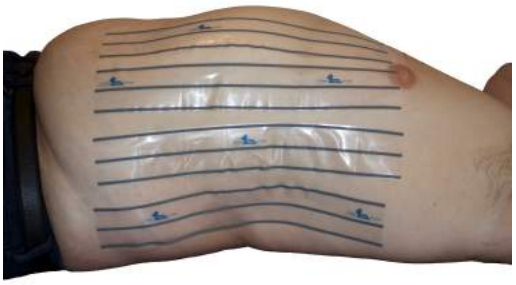
The lines create hyperdense dots in the CT slices; connect-the-dots™ to contour the body.

Effectively contour obese patients

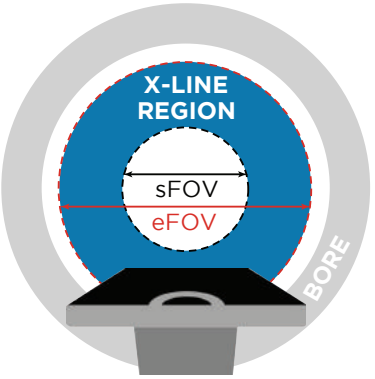
More than 100,00 obese cancer patients in Canada and the United States[1-3] cannot be accurately contoured with most CT simulators.[4,5]



Body shaped CT phantom that falls within the eFOV. The X-Line dots show the true contour in purple.



X-Line is applied over regions that are likely to protrude into the eFOV.



X-Line is useful for imaging patients within the eFOV of CT simulators.

Current methods of eFOV body contouring are inaccurate and may be harmful

Guessing the body contour

Guessing the body contour around distortion puts the patient at risk for improper treatment doses.[6-10] Displacement of 1-5 cm into the eFOV can result in distortions of up to 15% of the CT slice area.[10]

Relying on software

Image reconstruction software makes distorted regions appear clearer, but does not improve the accuracy of the resulting contour.[5] Patients are similarly at risk of improper radiation treatment doses.[6-10]

Fusing multiple CT scans

When multiple scans are used to image distorted regions,[11,12] patients are exposed to unnecessary X-ray radiation.[9,13] Extremely obese patients can experience up to 70-80 times the effective radiation dose of normal-weight patients.[14]

Clinical References

A Proposed Solution to Accurate Delineation of External Body Contour Within CT Extended Field of View (eFOV) and the Evaluation of Dosimetric Impact From Image Distortion in eFOV

Huang V, Kamarn J, D'Arcy R, Kohli K
Presented at AAPM 2016, July 2016

"With the aid of X-Line, the external body contour was accurately delineated within the eFOV."

"X-Grid provides clear visualization of body anatomy extending beyond the sFOV."

AAPM 2016 JUL 31–AUG 4
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An assessment of image distortion and CT number accuracy within a wide-bore CT extended field of view

Beeksma B, Truant D, Holloway L, Arumugam S
Published in Australasian Physical & Engineering Sciences in Medicine, June 2015

Springer

ACPSEM Australasian College of Physical Scientists & Engineers in Medicine

"For all phantom geometries, objects within the eFOV were geometrically **overestimated... from 0.22 to 15.94 %...**"

"... significant image artefacts from the eFOV reconstruction alter the... geometric contours of shapes within this region."

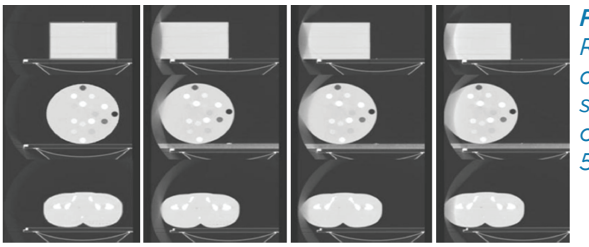

Figure 4
Rectangular, circular, and body-shaped phantoms offset 0, 1, 3, and 5 cm into the eFOV

Dosimetric impact of image artifact from a wide-bore CT scanner in radiotherapy treatment planning

Wu V, Podgorsak M, Tran T, Malhotra H, Wang I
Published in Medical Physics, June 2011

Medical Physics

"... artifacts from eFOV reconstruction are inevitable, with image distortions spreading out laterally..."

"The SSD distortion alone can cause a target dose calculation reduction of 2%–3%"

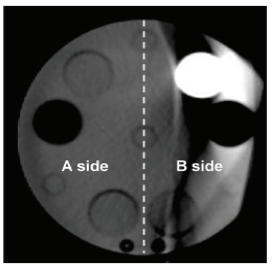

Figure 6
Image of the mini CT phantom located in the vicinity of the outer region of 65 cm eFOVwhere the "A" side was completely within the sFOV and the "B" side was within the eFOV.

REF Code	Description
X-Line™ 50L1	50ft roll

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Beekley Corporation
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