

# Ask EuroSafe Imaging Tips & Tricks

## CT Working Group

# Trauma board in CT examinations – effect on dose and image quality

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## Background

- Trauma patients often arrive at the x-ray department placed on a trauma board if spine or head/neck injuries are suspected
- The use of a trauma board will increase the attenuation of the radiation and the patient absorbed dose if automatic tube current modulation is being used
- The trauma board will have different effects on the absorbed dose and the image quality depending on its configuration and attenuating characteristics
- Children should be placed on a paediatric trauma board in order to keep the radiation dose to a minimum

## Considerations when using a trauma board

- A trauma board will position the patient higher up from the examination table than normal: correct centering (if possible) is, however, still important
- Since a regular head holder cannot be used, an extension of the table or simply the board itself “free-in-air” can be used.



## Increase in absorbed dose at a fixed scan length

- Comparing DLP for an adult alderson phantom positioned on or off a trauma board during a trauma scan will give an example of the increase in absorbed dose to the patient
- Potential artefacts in the images can also be evaluated

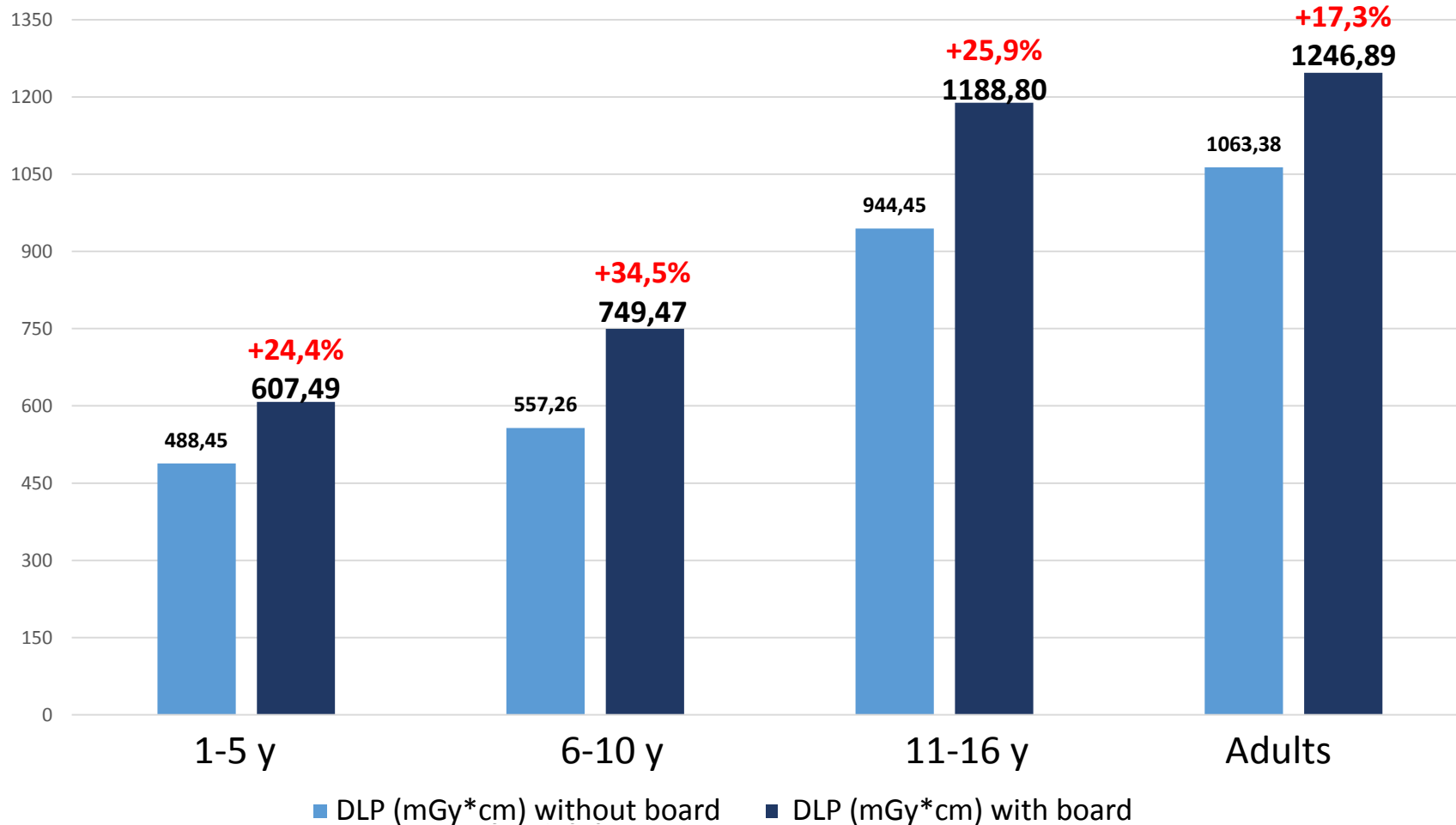


## Increase in absorbed dose for a “child” on an adult trauma board

- Using smaller water phantoms is a rough illustration of the absorbed dose to a child placed on an adult trauma board



Total DLP for the phantoms and resulting increase in DLP when using the trauma board

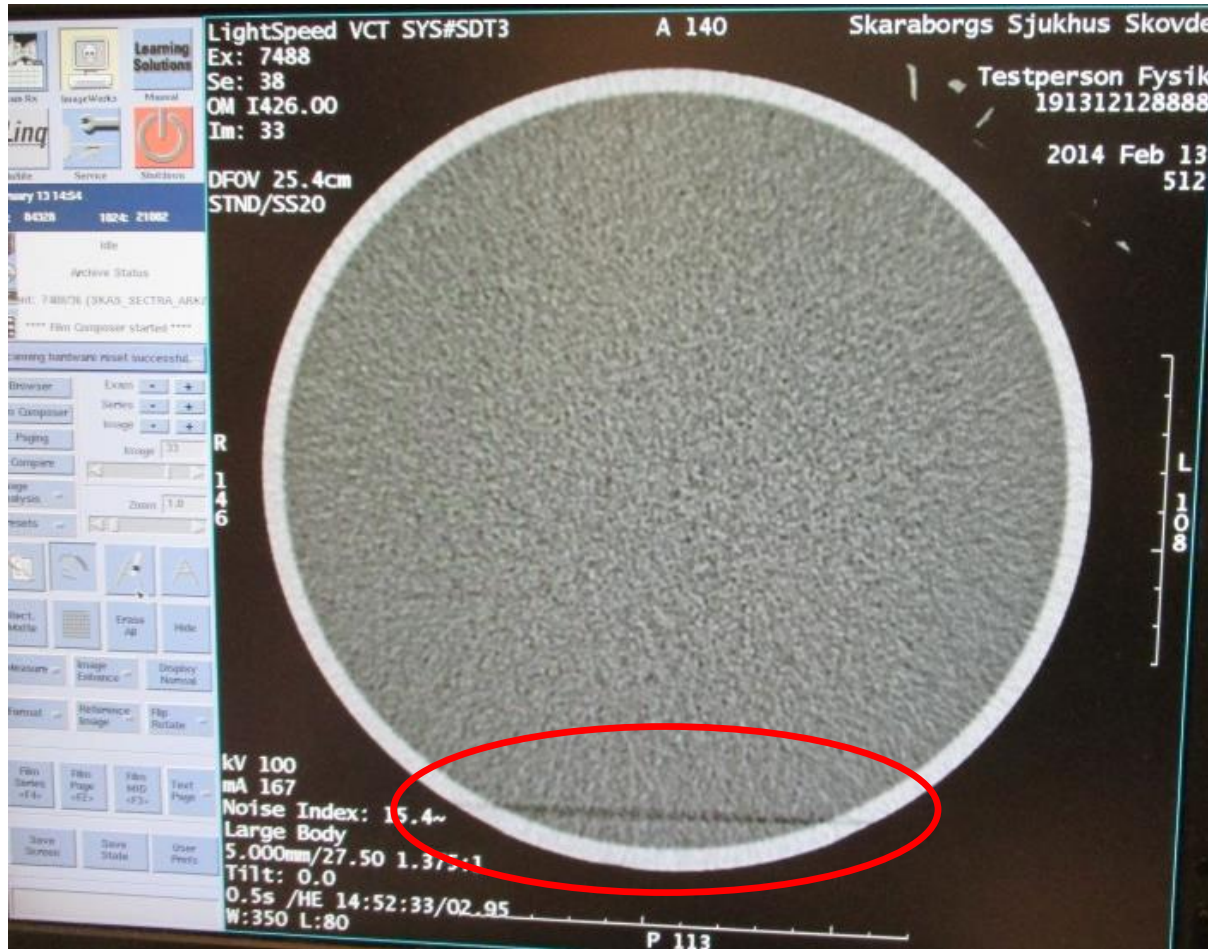


### Percentage increase in DLP for different scanned areas

	Head*	Neck	Chest/abdomen	Total
Child 1-5 years	22,7%	28,1%	32,9%	24,4%
Child 6-10 years	37,4%	12 %	29,5%	34,5%
Child 11-16 years	34,3%	10,9%	16,7%	25,9%
Adult	33,6%	0 %	2,6 %	17,3%

\*including an extension of the table

# Any artefacts?





## Conclusions

- Patients with suspected spine and/or head/neck injuries placed on a trauma board will receive an increase in absorbed dose. For this particular trauma board, approximately 20%.
- Artefacts can occur.
- Children should be placed on trauma boards that are adapted to their size in order to minimise dose increase and risk of artefacts.
- Patients that do not have reasonable indications of spine and/or head/neck injuries should not be placed on a trauma board.
- There are several manufacturers of trauma boards. The attenuation and risk of artefacts should be considered when purchasing a new trauma board to the emergency department.

## Acknowledgements

- The measurements in this example were performed and summed up by radiographers Zandra Ek and Tove Törner at Skaraborgs Hospital in 2014, who provided all images and graphs.