

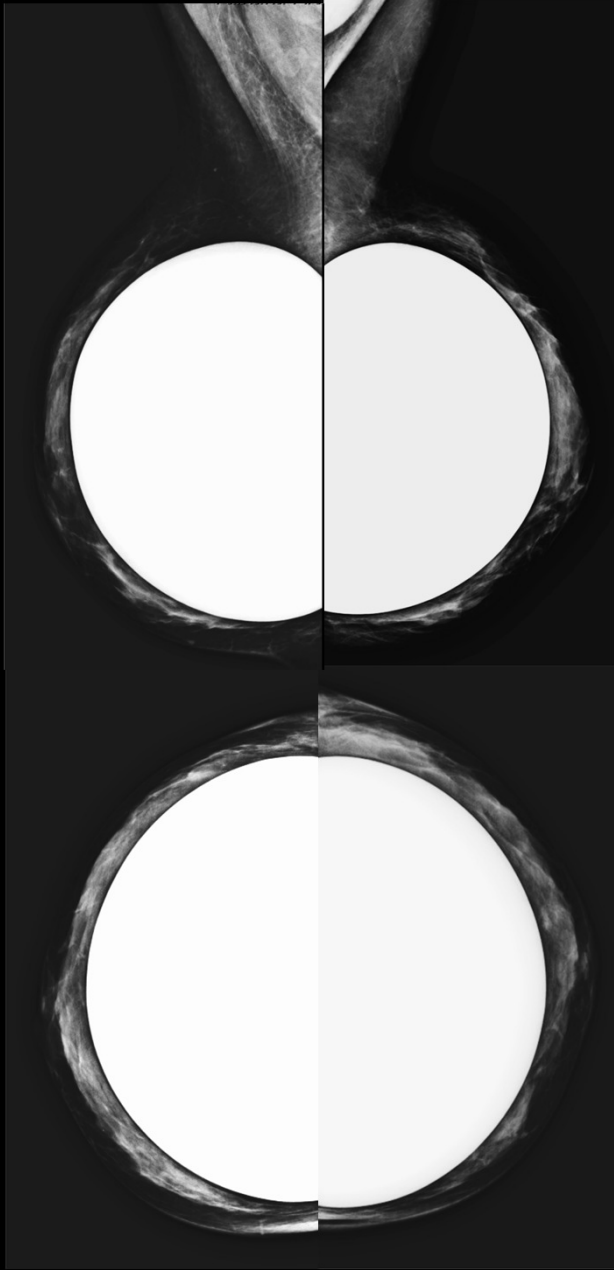
## MEAN GLANDULAR DOSE ESTIMATION FOR DIGITAL AUGMENTATION MAMMOGRAPHY

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# Purpose

- In the last decade, there was a significant increase in the number of women undergoing mammography for screening of breast cancer and have breast implants.
- To increase the visibility of lesions in those patients the American College Radiology recommends that whenever possible be held in addition to the standard views, additional views with posterior displacement of the implant (ID) known as Eklund maneuver.



# Purpose

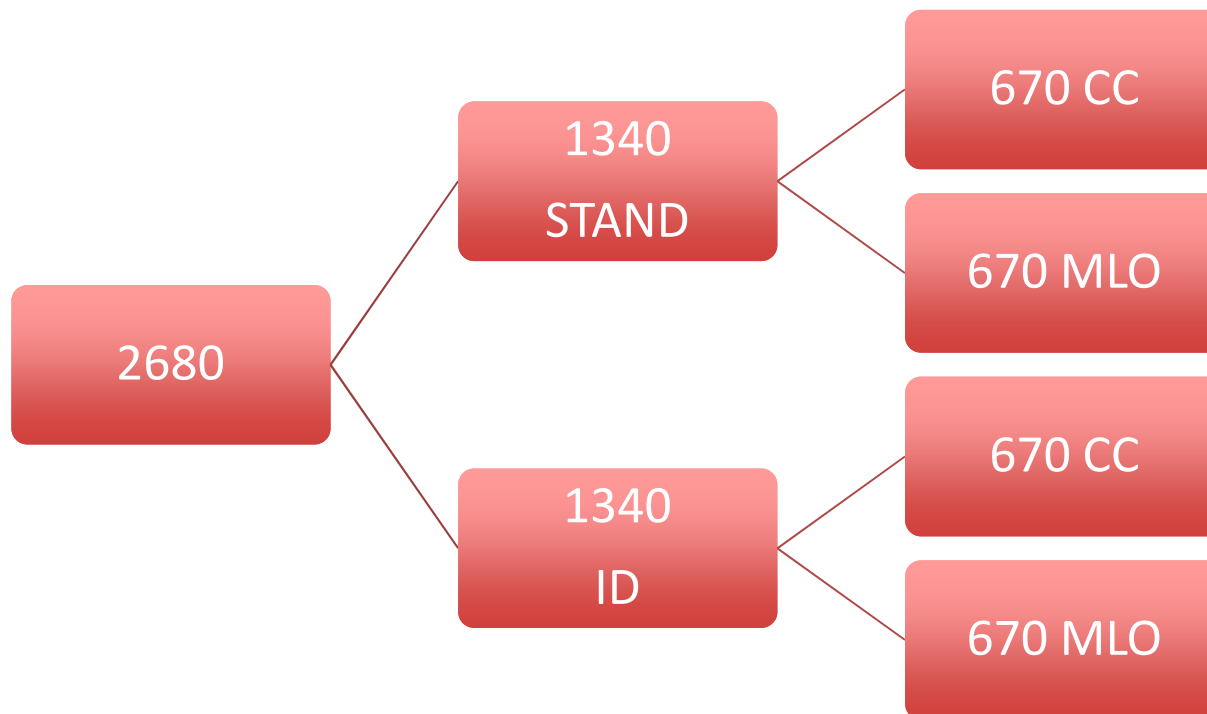
- Due to this fact the patients with cosmetic breast augmentation receive higher radiation doses during the exam than women without implants.
- The mean glandular dose (MGD) is widely accepted as the most appropriate measurement for predicting the risk of radiation-induced cancer.

# Objective

- To estimate the mean glandular dose (MGD) received by patients with breast implants undergoing screening mammography.

# Methods

335 Exams



STAND- Standard  
ID- Implant Displacement View

## Variable:

- \*Effective tube current;
- \*Peak kilovoltage;
- \*MGD;
- \* Breast thickness;
- Implant position;
- Breast density.

\* DICOM

# Summary of Results

- The average MGD in the right breast was  $9.74 \pm 0.56$  mGy and in the left breast  $9.83 \pm 0.65$  mGy.

Tipo de Imagem	Média DGM (mGy)		Valor p*
	Direita*	Esquerda*	
Crânio-Caudal			
PADR	$3,28 \pm 0,43$	$3,28 \pm 0,43$	0,892
MDPI	$1,42 \pm 0,43$	$1,41 \pm 0,74$	0,750
Médio Lateral-Oblíqua			
PADR	$3,35 \pm 0,45$	$3,38 \pm 0,44$	0,359
MDPI	$1,69 \pm 0,93$	$1,76 \pm 0,98$	0,291

T student

# Summary of Results

- Retroglandular position was the most frequent 84.8%

Laterality	Implant Position		p*
	Retroglandular (N= 284)	Retropectoral (N= 48)	
Right	9,74 ± 1,69	9,83 ± 1,11	0,111
Left	9,87 ± 1,60	9,60 ± 1.68	0,240

\* Mann- Whitney test


- The implant position does not interfere in MGD



# Summary of Results

- MGD increases according to breast density

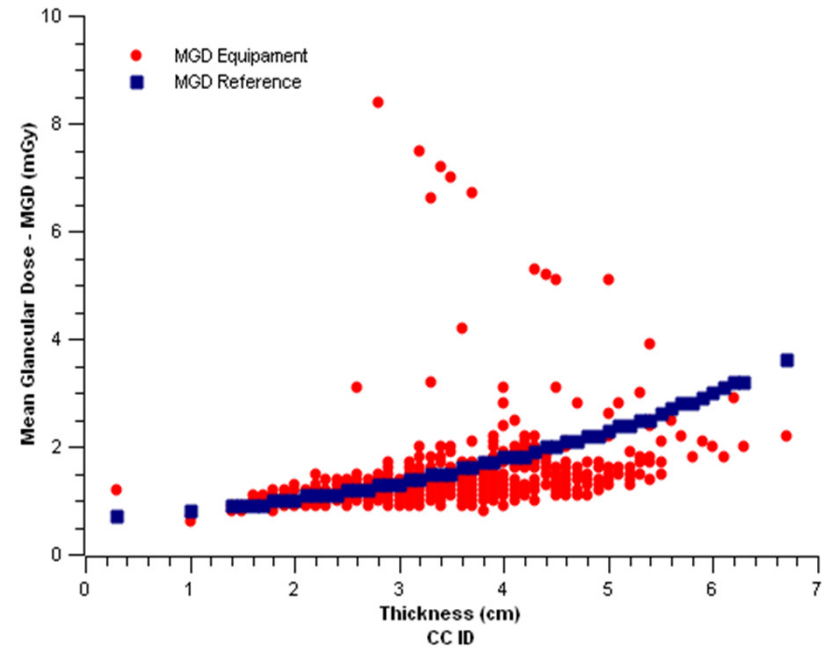
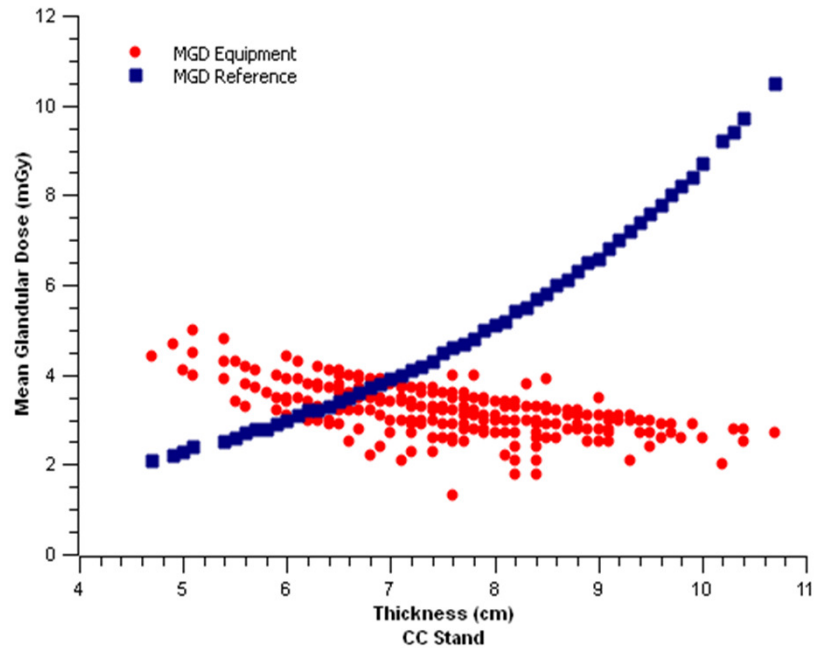
Breast Density	MGD (mGy)	
	Right	Left
A - Almost entirely fatty	9.12 ± 1.60	9.36 ± 1.10
B - Scattered areas of fibroglandular density	9.59 ± 1.74	9.69 ± 1.83
C - Heterogeneously dense, which may obscure small masses	10.11 ± 1.46	10.14 ± 1.33
D - Extremely dense, which lowers the sensitivity of mammography	10.67 ± 1.69	10.76 ± 2.09
p*	0.000	0.002



\* Anova

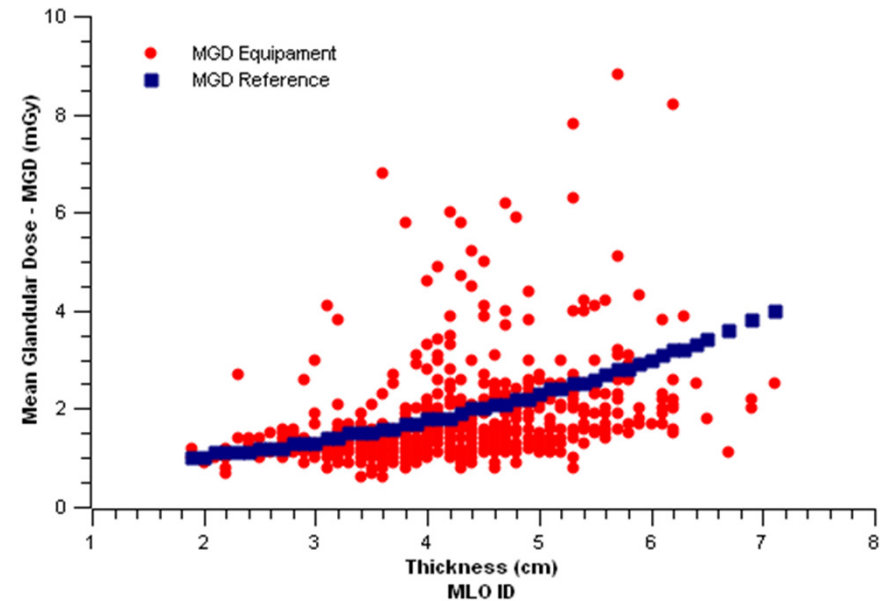
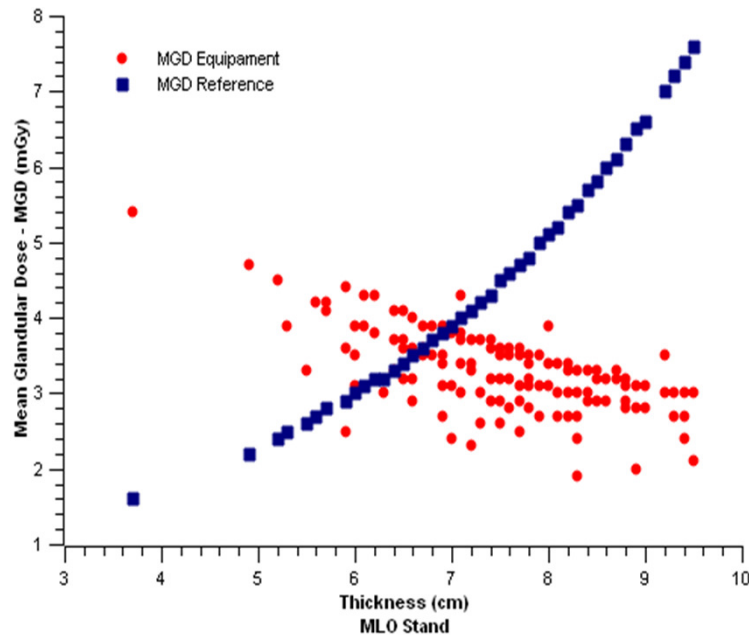
# Summary of Results

- MGD x Thickness



# Summary of Results

- MGD x Thickness



# Conclusions

- The greater contribution to the MGD is coming from the STAND views.
- The radiation dose as expected was higher in dense breasts.
- Radiographic techniques chosen for STAND views may be interfering with image quality

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3. [EKLUND, G. W.](#); [BUSBY, R. C.](#); [MILLER, S. H.](#); [JOB, J. S.](#) Improved imaging of the augmented breast. AJR v. 151, n. 3, p. 469-473. 1988.
4. [SMATHERS, R. L.](#); [BOONE, J. M.](#); [LEE, L. J.](#); *et. al.* Radiation dose reduction for augmentation mammography. AJR v. 188, n. 5, p. 1414-1421. 2007.