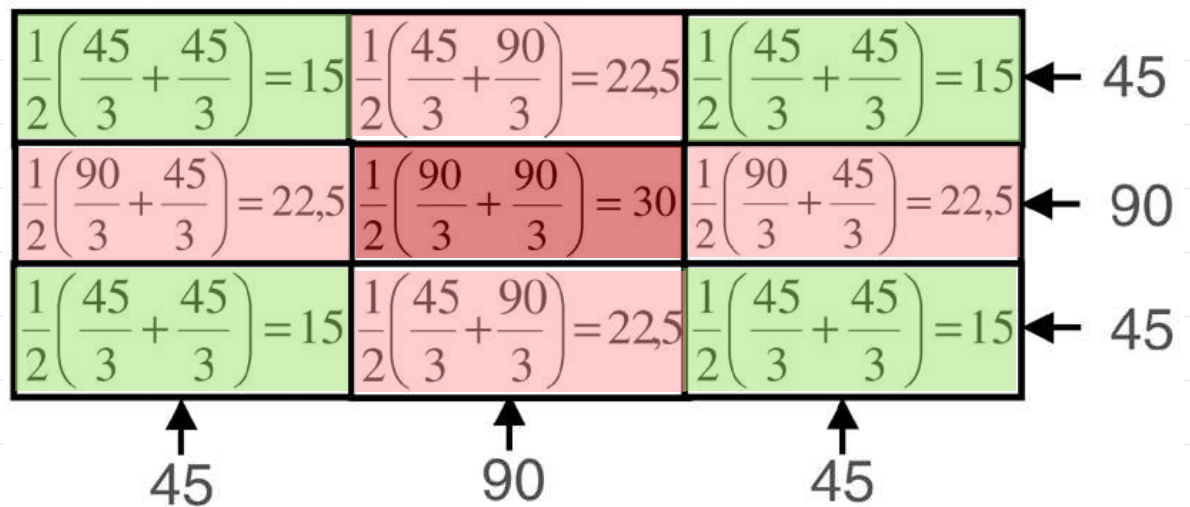
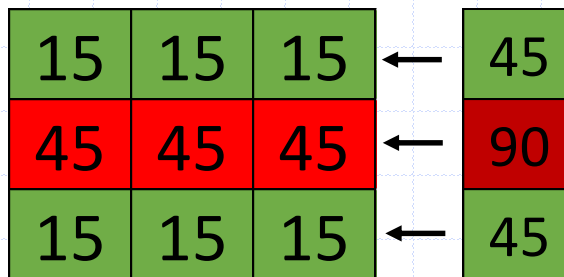
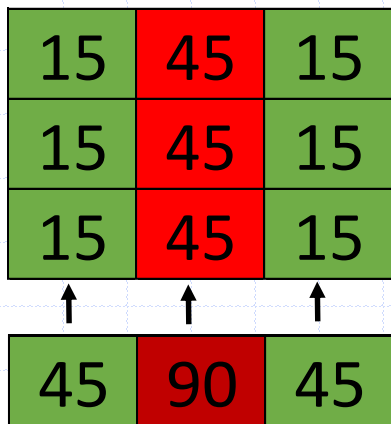
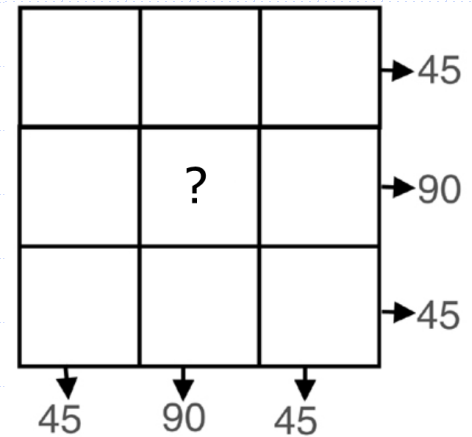
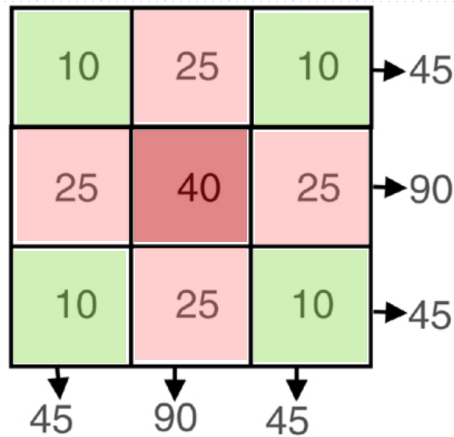


SCINTIGRAPHIQUE DE PERFUSION MYOCARDIQUE

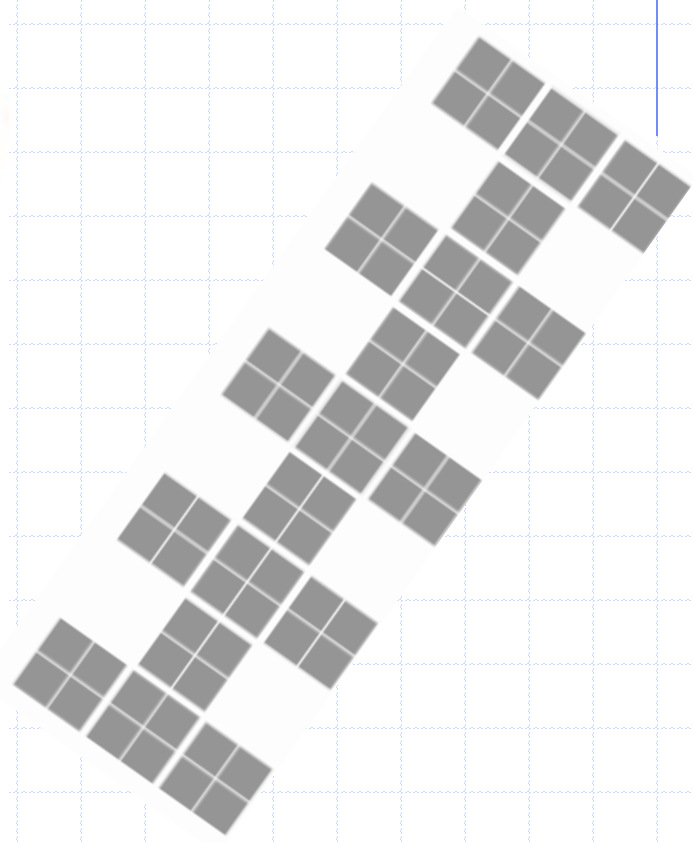
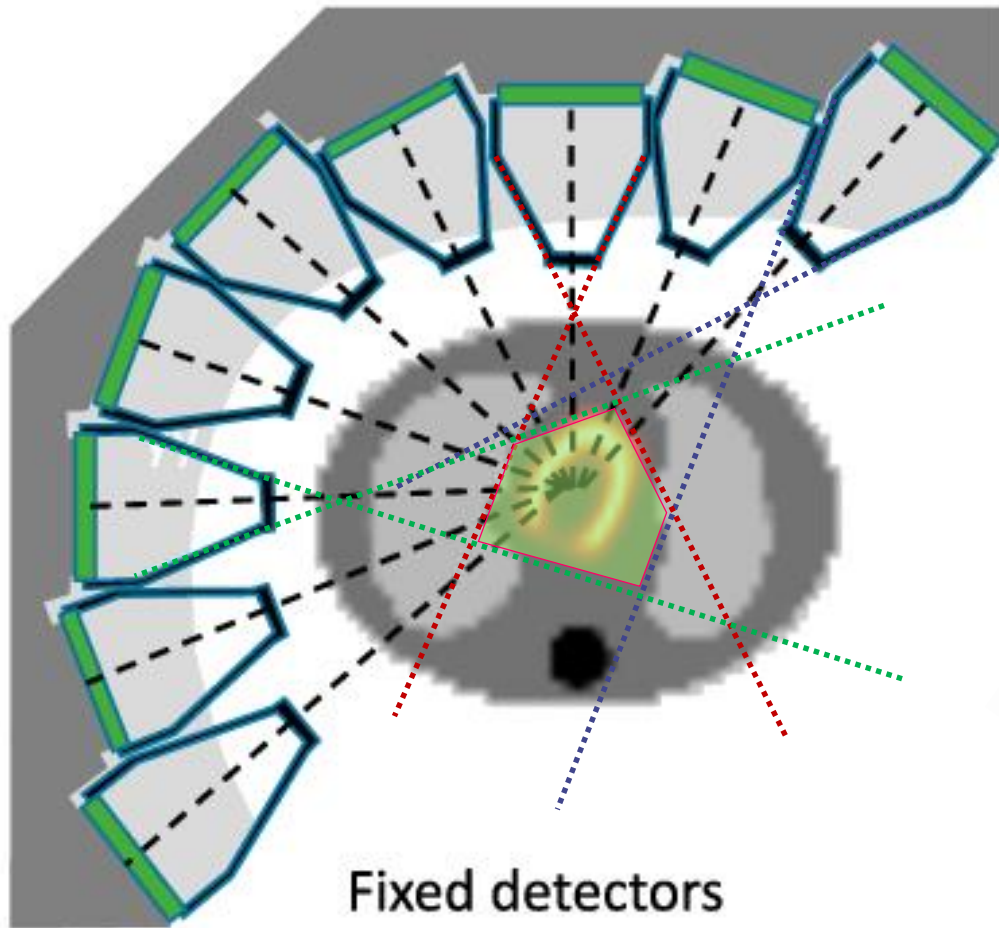
FORMATION CONTINUE DES MANIPULATEURS EN ELECTORADIOLOGIE; 6 mai 2024

Denis MARIANO-GOULART
Département de médecine nucléaire
CHRU de Montpellier
<http://scinti.edu.umontpellier.fr>

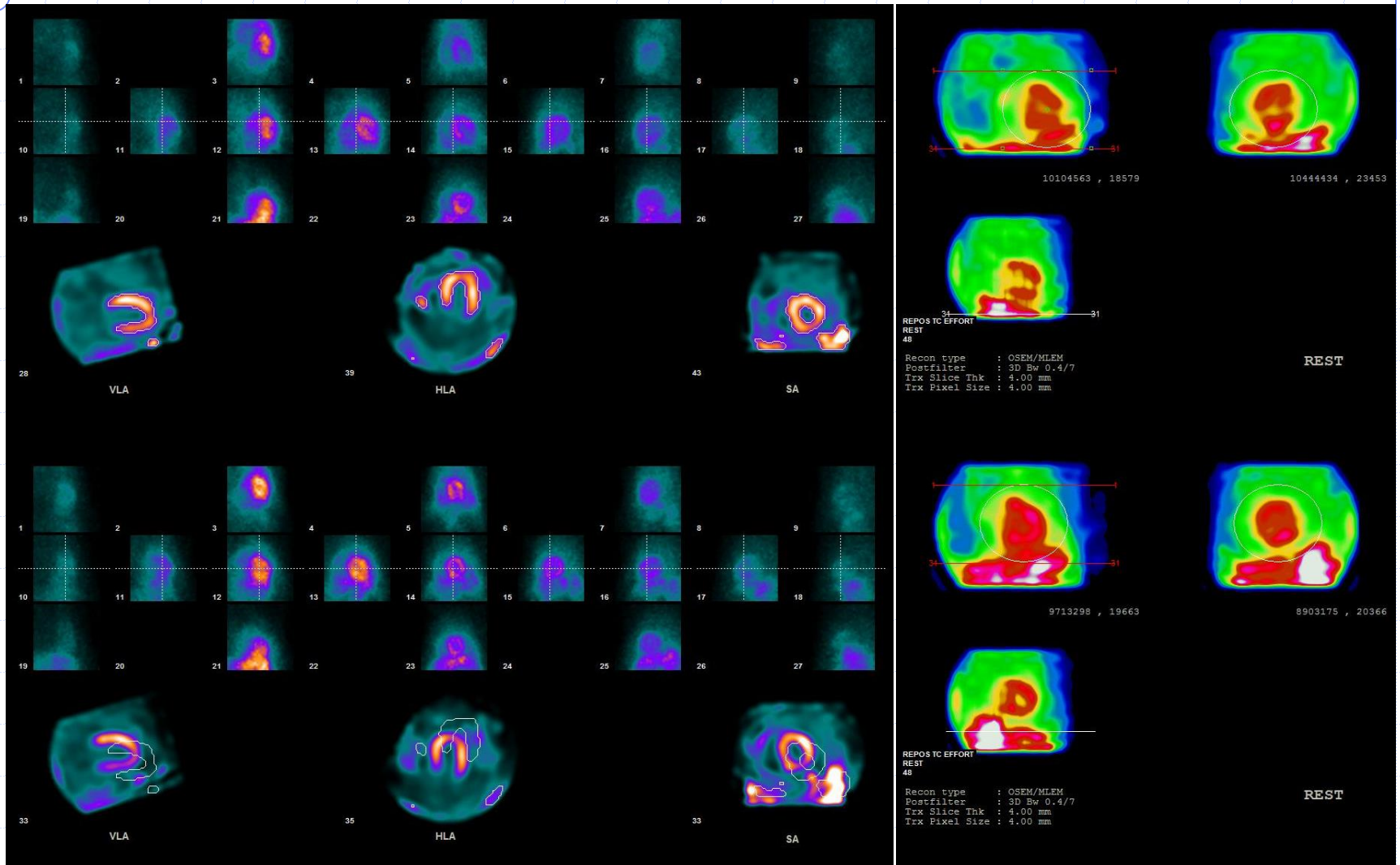
CENTRAGE



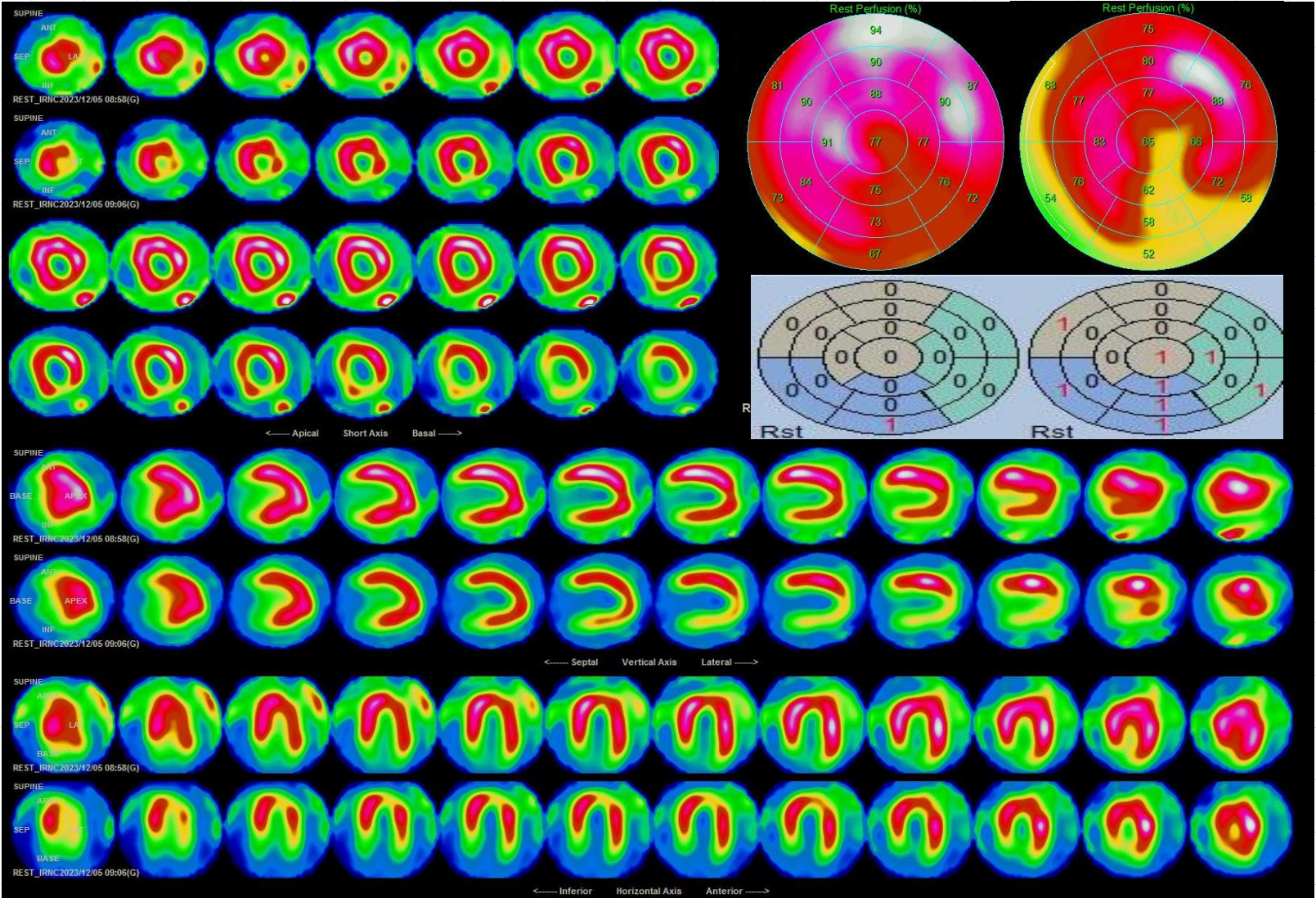
POURQUOI CENTRER ?



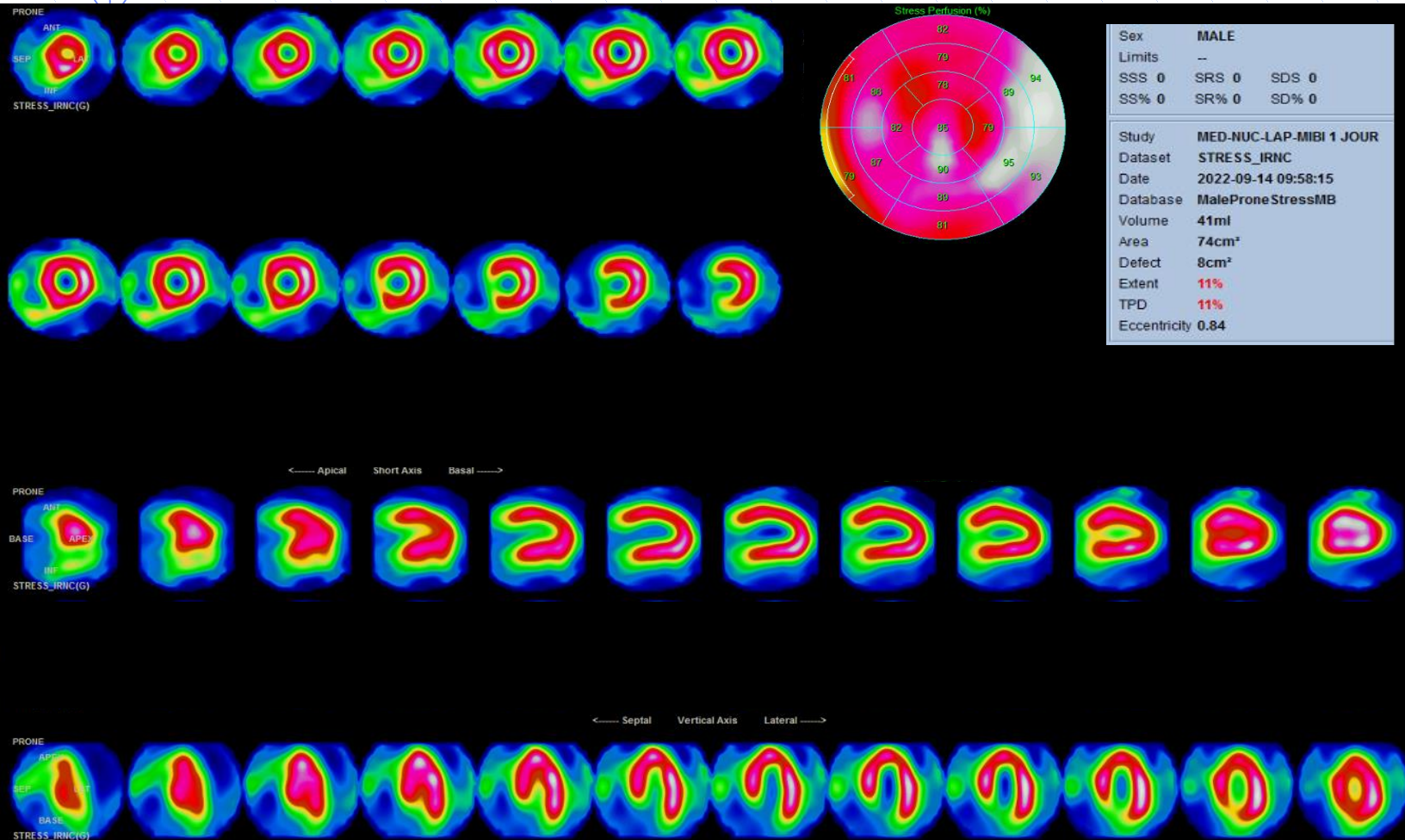
POURQUOI CENTRER ?



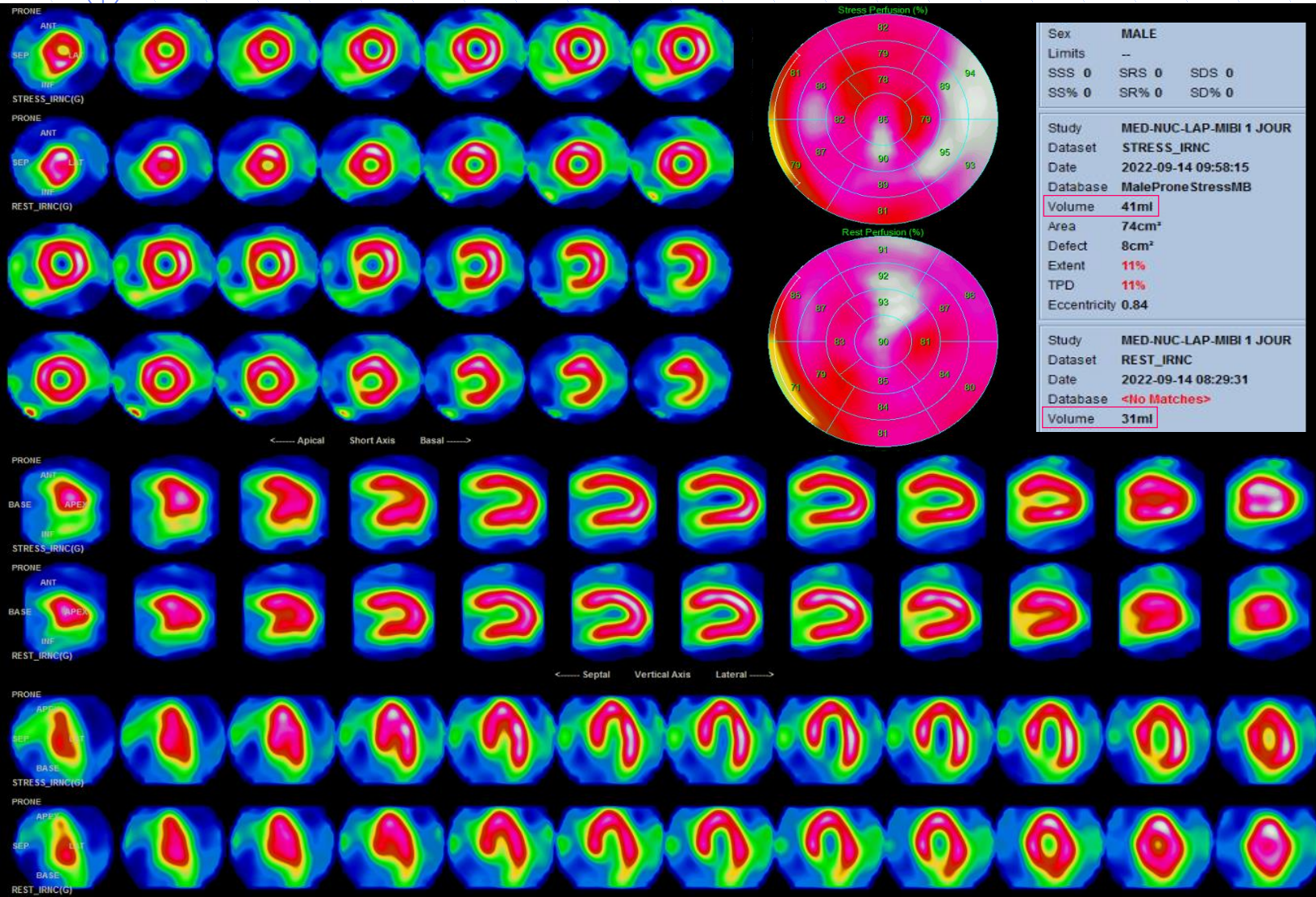
POURQUOI CENTRER ?



POURQUOI REPOS + EFFORT ?



POURQUOI REPOS + EFFORT ?



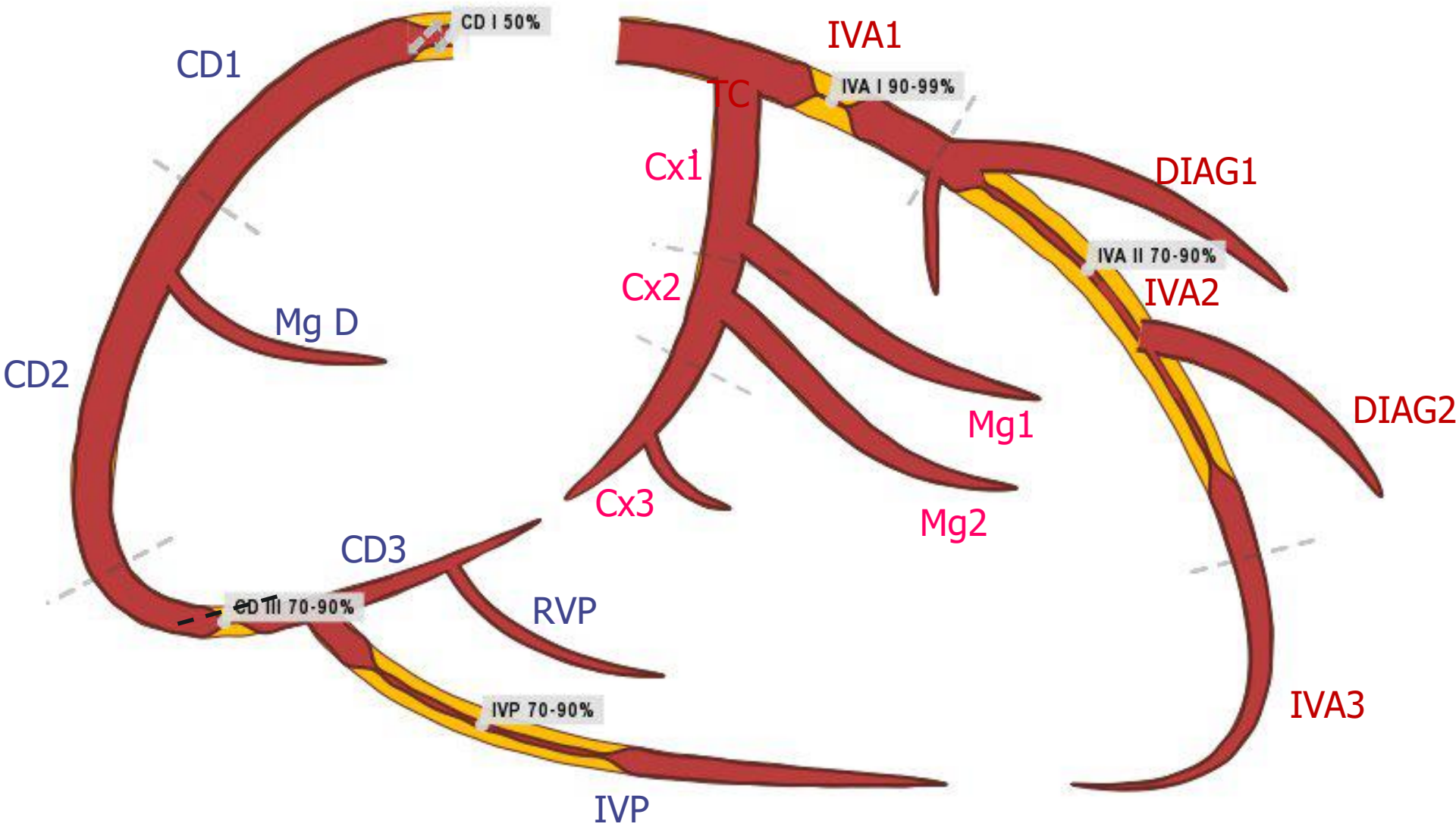
$$\frac{V_{\text{stress}}}{V_{\text{repos}}} = 1,32$$

Si effort en 1°:

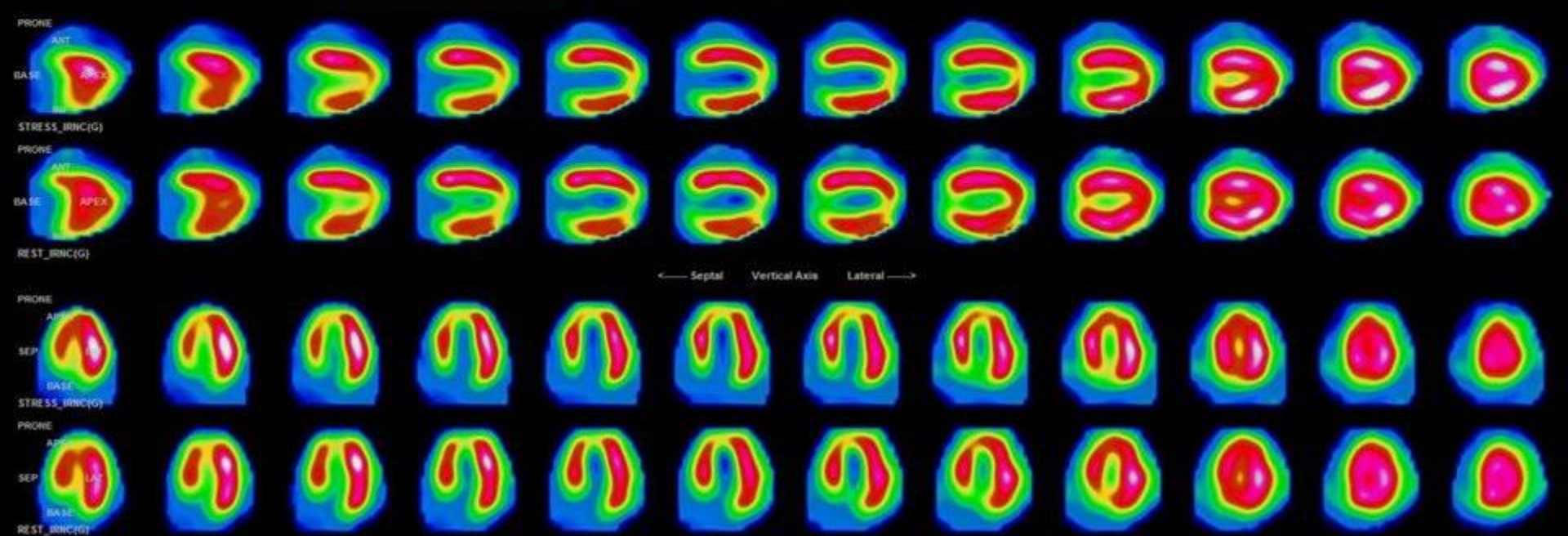
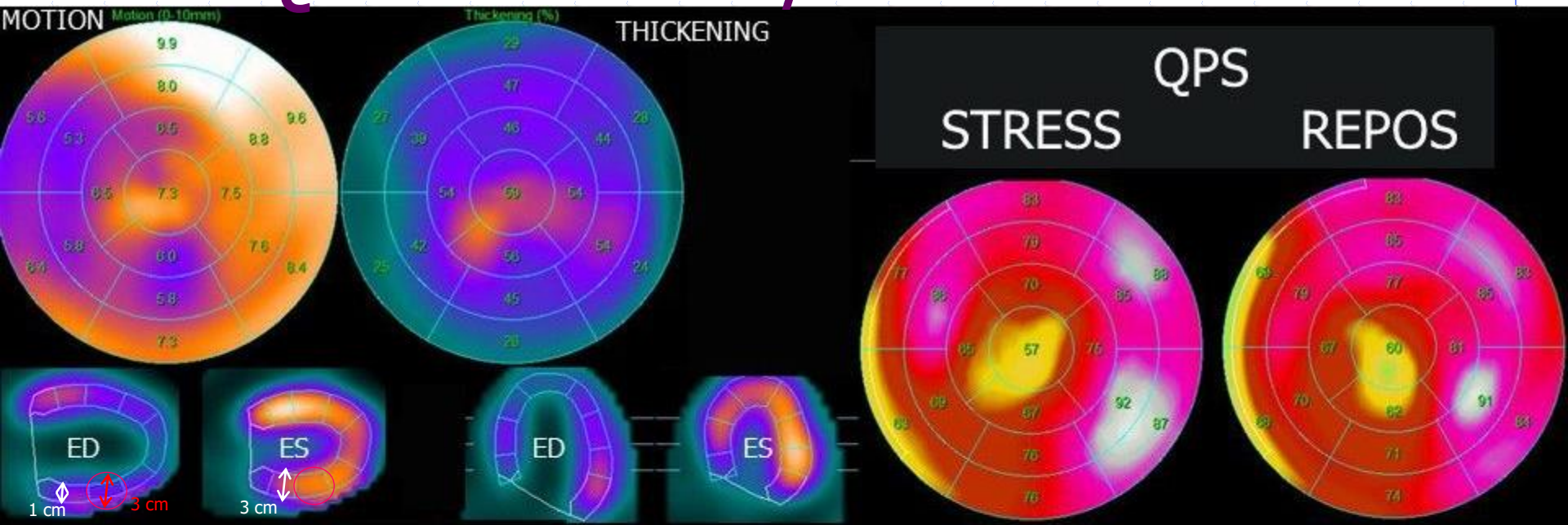
attendre 3h
pour éviter une
sidération
persistante
au repos

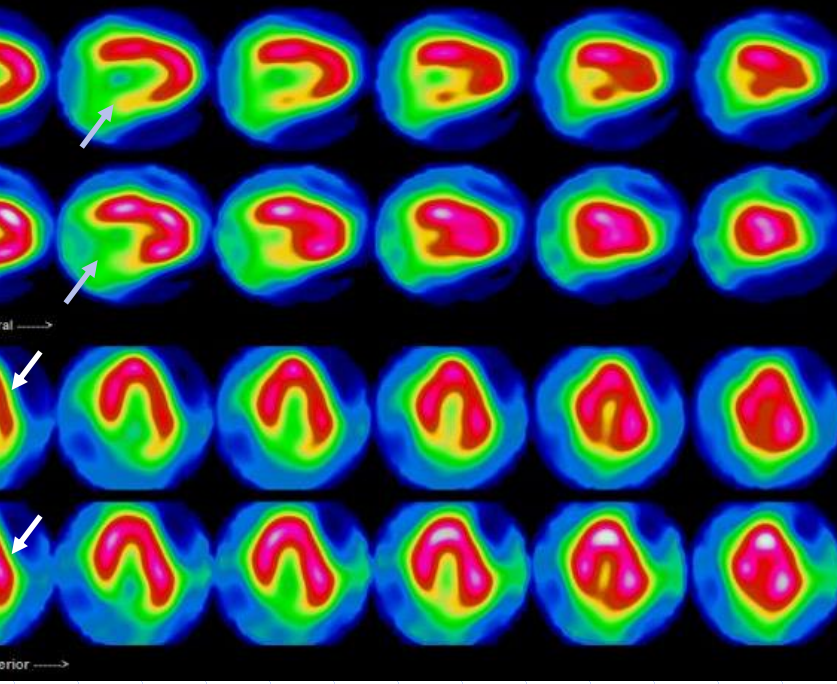
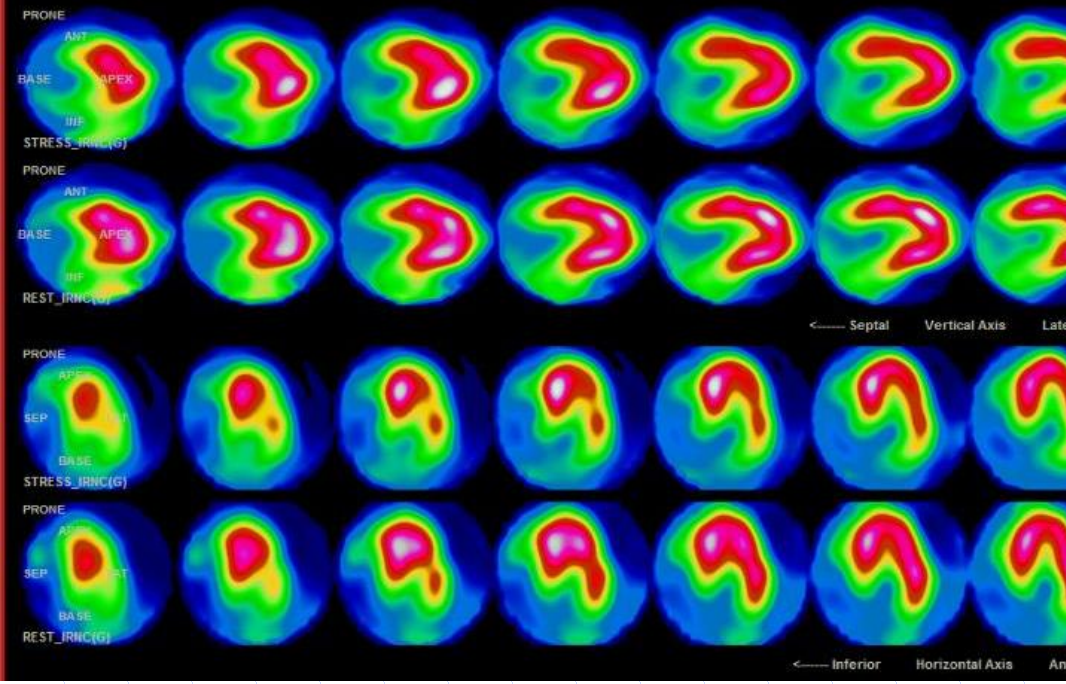
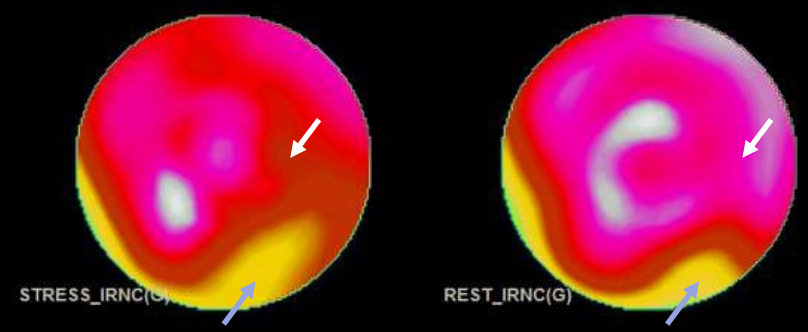
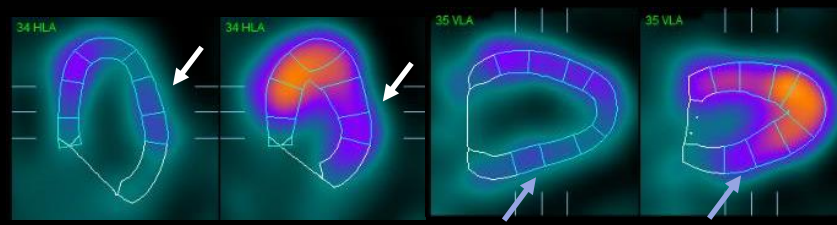
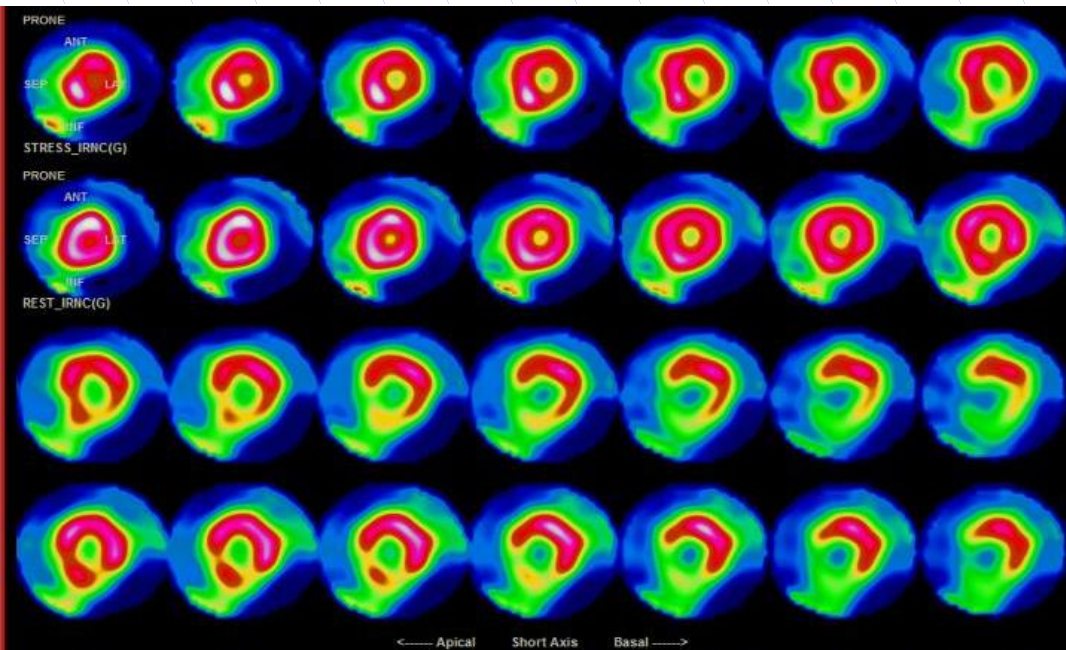
DEF = $V_{\text{stress}} / V_{\text{repos}} > 1,12-1,38$ (sans synchro)

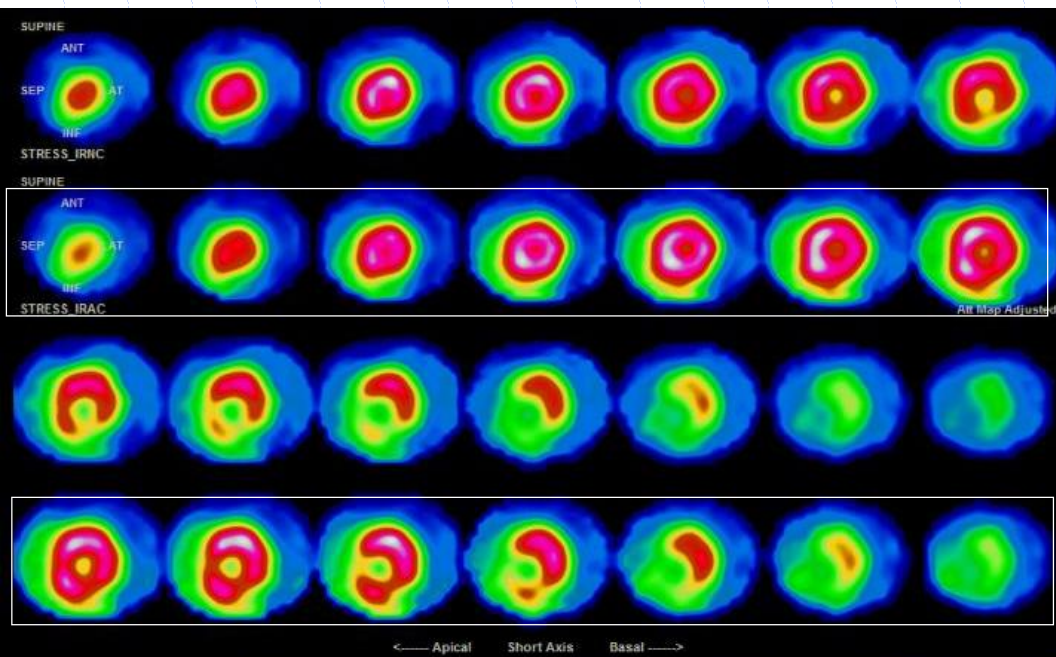
Sp = 88 % Se = 44 %



POURQUOI ECG +/- CT ?





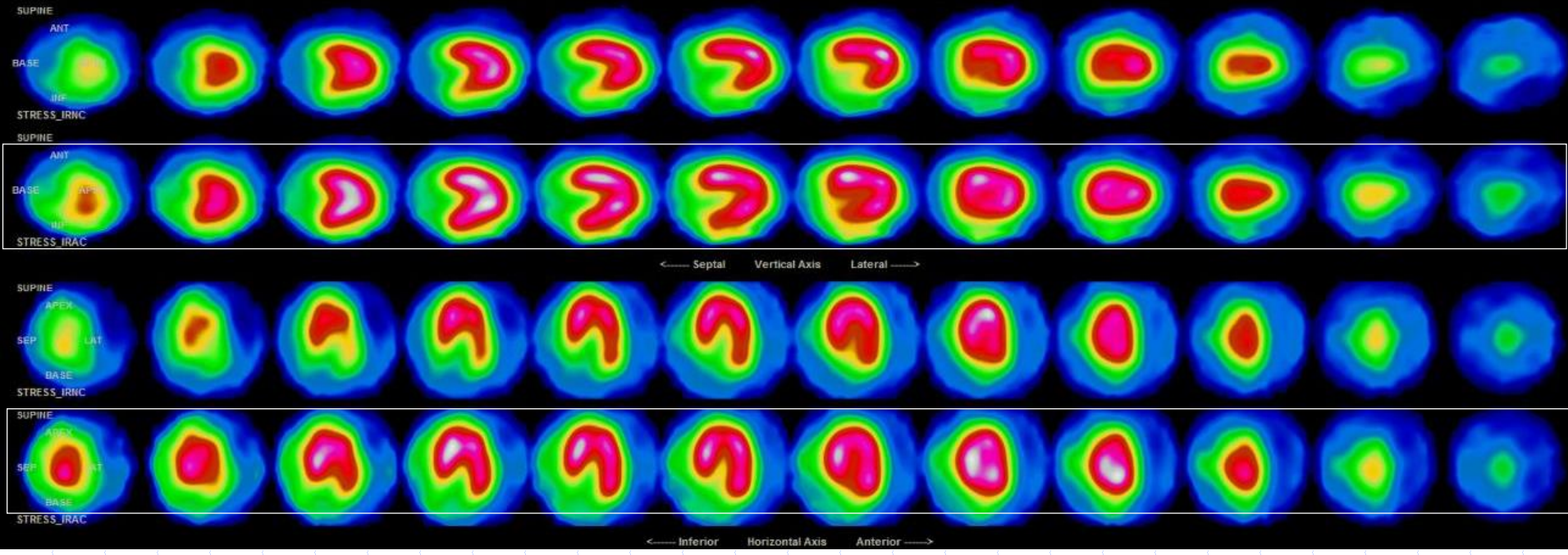
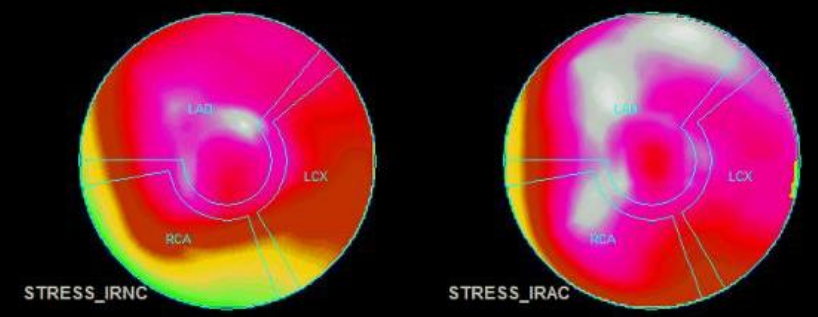


STRESS_IRNC

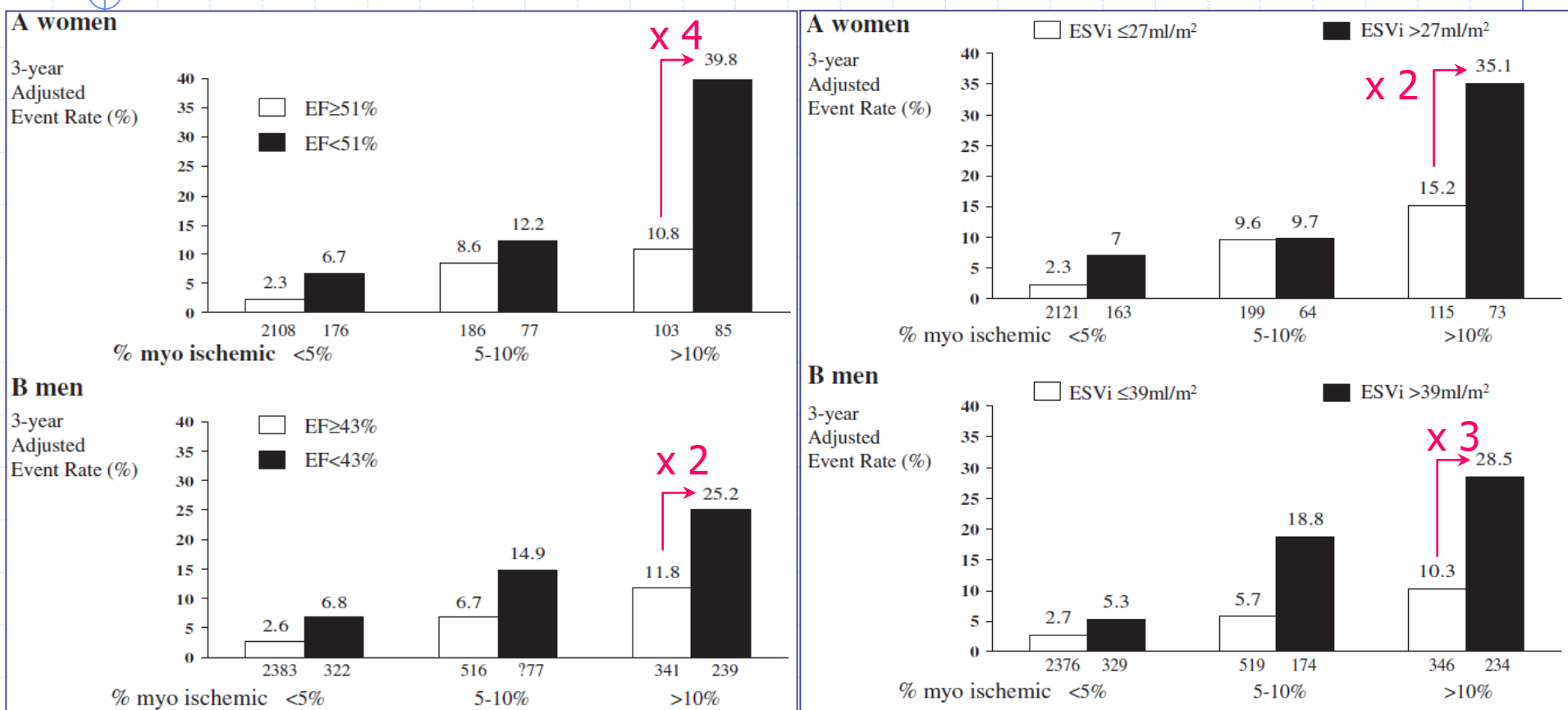
Date: 2024/04/29 13:11
 SA Pixel Size: 6.80mm
 SA Thickness: 6.80mm
 Recon: OSEM/Bw/0.25/5

STRESS_IRAC

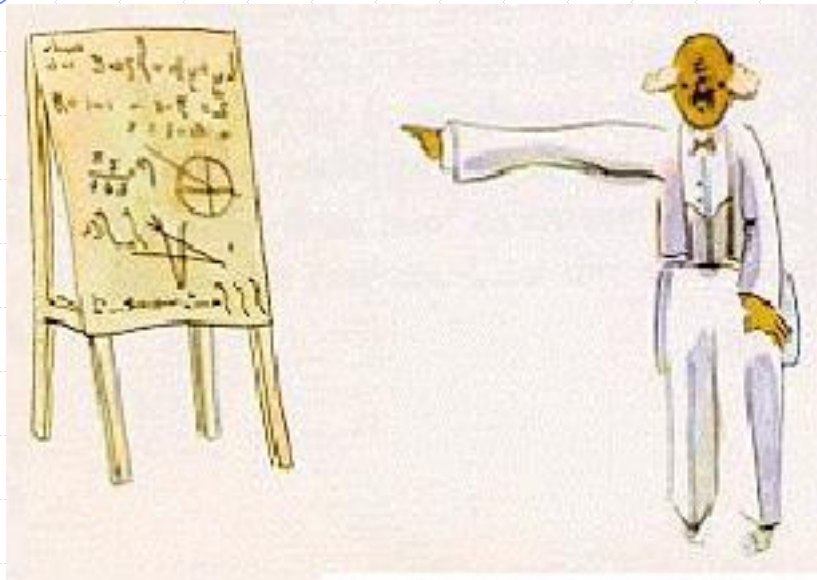
Date: 2024/04/29 13:11
 SA Pixel Size: 6.80mm
 SA Thickness: 6.80mm
 Recon: OSEM/Bw/0.25/5



Gated SPECT et pronostic à 3 ans

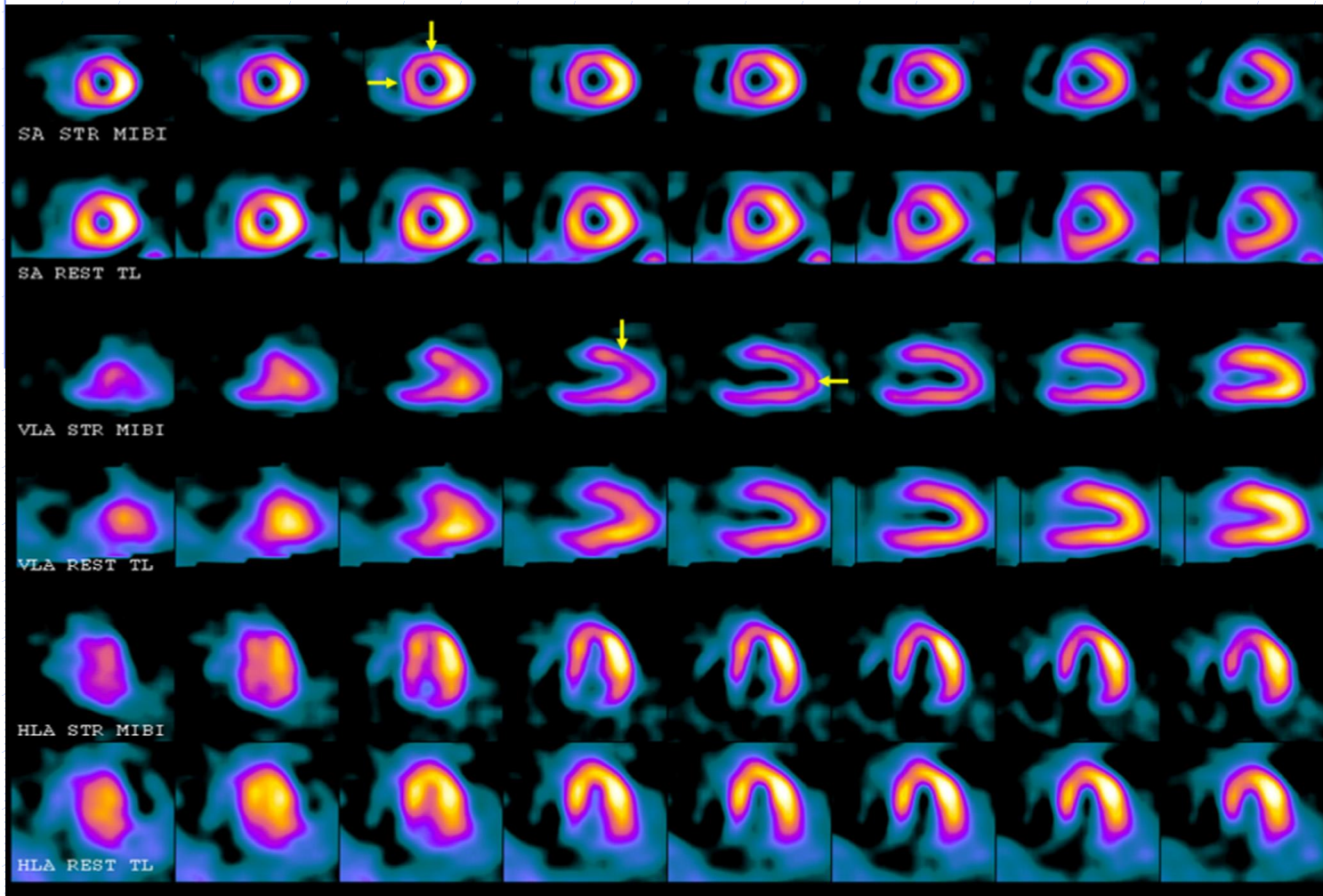


6713 patients = 2735 femmes et 3978 hommes,
suivi 35 ± 14 mois pour IDM ou mort cardiaque

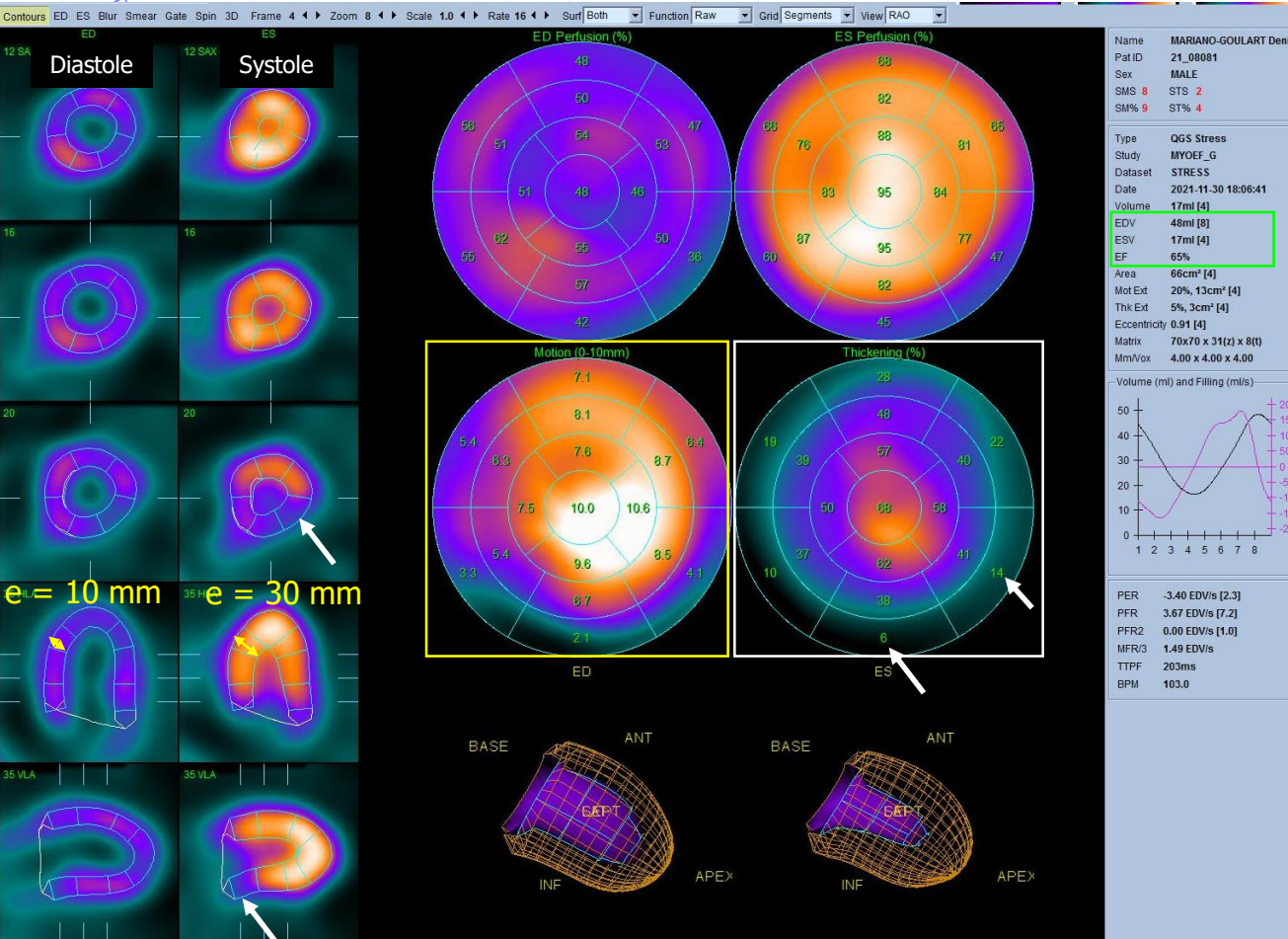


Merci pour votre attention...

BBG



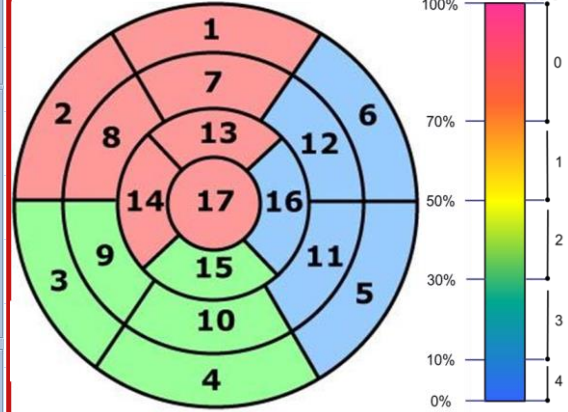
Quantitative Gated SPECT (QGS)



$e_{L=10\text{ mm}}$ $e_{L=30\text{ mm}}$

$e_{LMH} = 0,7$ $e_{LMH} = 2$
 $CR = 0,6$ $CR = 1$
 Perte de 40 %

1- Quantification relative (QPS)
 Scores sommés : ischémie/nécrose
 % Surface VG anormale



2- Dilatation VG (QPS)
DIT: $V_{\text{stress}}/V_{\text{repos}}$ (non gated) > 1,4
Remodelage VG : $V > 63 \text{ mL/m}^2$
 soit environ 120 (H) ou 100 (F) mL

3- Cinétique segmentaire (QGS)
Sidération (au stress): $\emptyset < 20\%$, 3T
Hibernation (au repos et stress)

4- Artefacts d'atténuation (QGS)
 Hypo S/R à ES normal > AC par CT

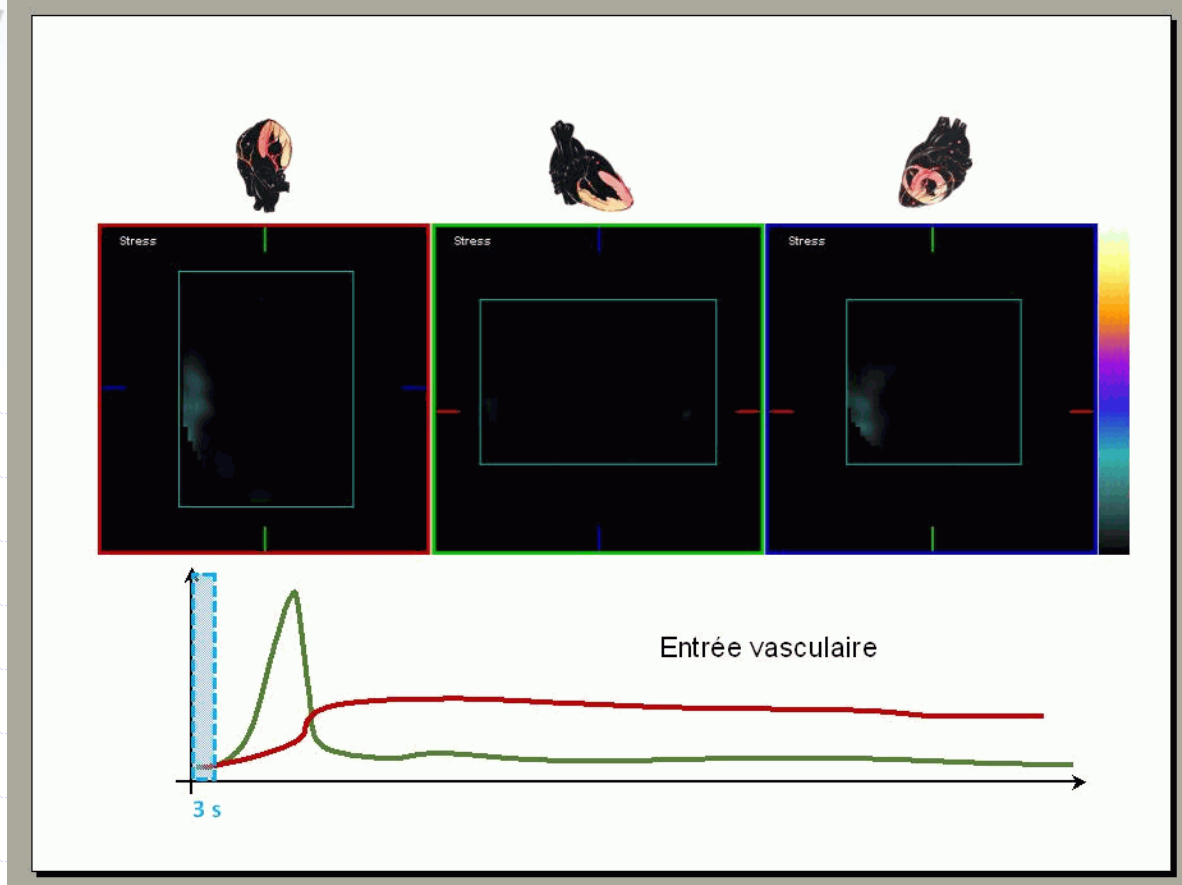
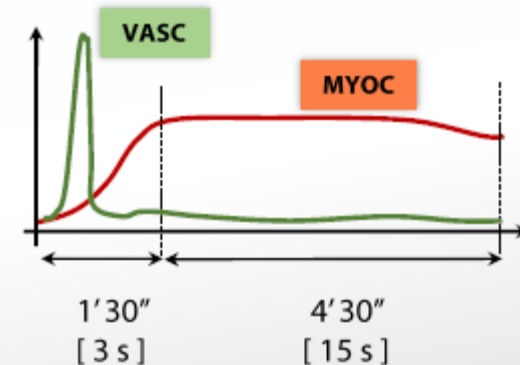
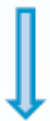
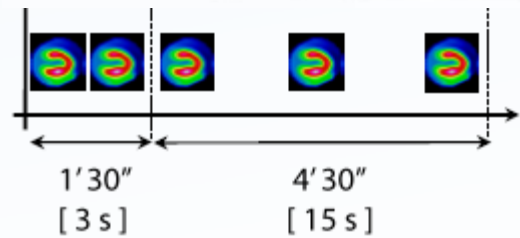
5- Pronostic CV à 3 ans (QGS)
 $FE < 51$ (F) ou 43% (H)
 $ESV > 27$ (F) ; 39 (H) mL/m^2 ($\approx 50;75 \text{ mL}$)

JR Galt. IEEE Trans Med Imag. 1990; 9 ; G Germano. JACC 1997;30 ;
 T. Sharir et al. Circulation 1999;100 ; J Nucl cardiol 2006;13(4) et J Nucl cardiol 2018;25; Emmet JACC 2002;39;
 S Karimi-Ashtiani J Nucl Med 2012;53; Wei Yang J Nucl Cardiol 2018;25

Pièges et astuces

- **FN (versus coronarographie).** Pour les éviter :
 - Epreuve de stress maximale (mixte), TA, interprétation conjointe.
 - Protocole repos/stress (DIT, Gated S/R)
 - ES de stress et de repos (tri tronculaires: Se 20→50%)
 - Activité digestive : SPECT 5' après IV. Reprendre si besoin.
- **FP**
 - ≠ FP à coroscan ± coronarographie normaux : Spasme coronaire, coronaire intra-myocardique, CMPH, dysfonction microvasculaire (diabète:RC)
 - Atténuation et Mouvement diaph.: Exercice, SPECT rapide au Tc, Pro/Decubitus, ES, CA
 - Ischémies de stress (ou S/R) faussement positives : regarder l'échocardio...
 - SEPTAL : BBG si $fc > 100$: persantine sans effort significatif
 - LATERAL : RAo et HTA (FP E/R sur septum épaissi)
 - APICAL : Takotsubo, IAo (sur HVG)
 - BASAL : IM ou prolapsus mitral ↑ si fc ↑ (tension sur muscles papillaires)
 - Antérolat/infseptal (2h/7h : muscles papillaires)
 - Infseptal/antéroseptal (7h/11h: HVD)
 - Diffus: CMPD (E/R sur EVP), séquellaire à M1 d'une angioplastie, maladies de surcharge (sarcoïdose, amylose)

SPECT DYNAMIQUE (LIST MODE)



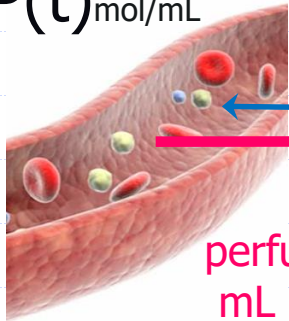
1 mCi Tc-TF 5 mCi Tc-TF 0,56 mg/kg DIP 18 mCi Tc-TF

● ← ● ← ● ← ●

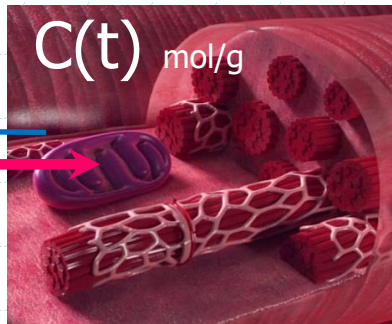
centrage Repos List 5' 4' Stress List 5'

RESERVE CORONAIRE

$P(t)$ mol/mL



$k_2 \approx 0$

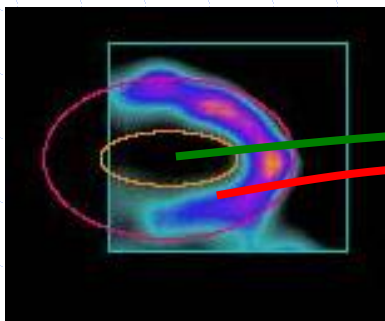


$C(t)$ mol/g

K_1
perfusion en
mL de sang
par g de tissu
et par minute

$$\frac{dC(t)}{dt} = K_1 \cdot P(t) \Rightarrow \int_0^t \frac{dC(t)}{dt} dt = K_1 \cdot \int_0^t P(t) dt$$

$$C(t) = K_1 \cdot \int_0^t P(t) dt$$

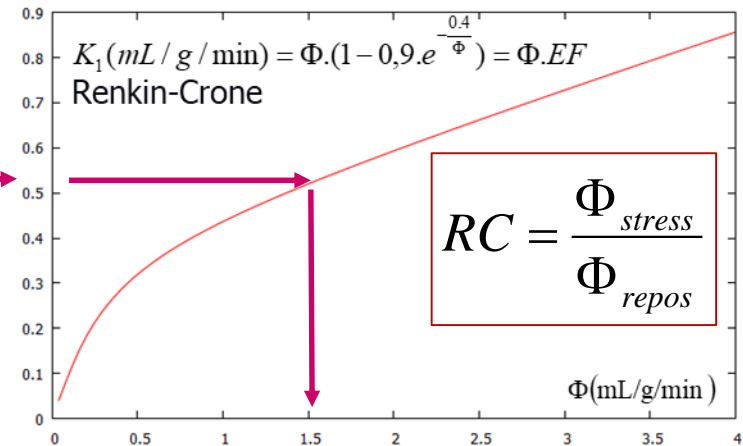


$P(t)$

$C(t)$



$$K_1 = \frac{C(t)}{ASC(t)} \approx \frac{\bar{C}_{Myoc\ plateau}}{ASC_{Pic\ vascu}}$$



(correction EVP et contamination P→C)