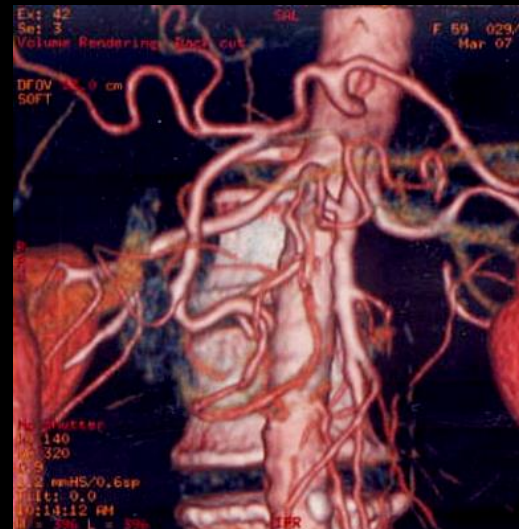
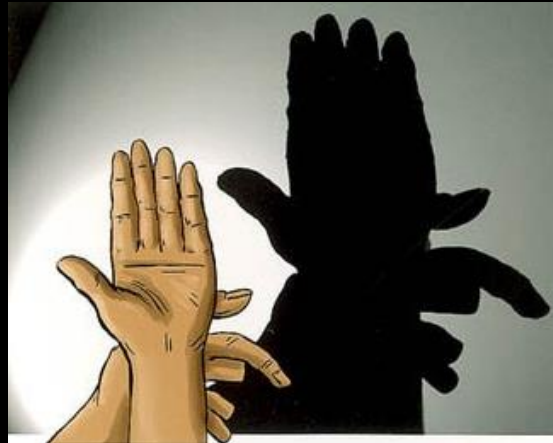




L'imagerie médicale diagnostique



1. La radiologie "conventionnelle " (classique) ou imagerie par projection



Première radiographie
: décembre 1895
W. C. Roentgen



durée de l'exposition ~ 16 minutes !

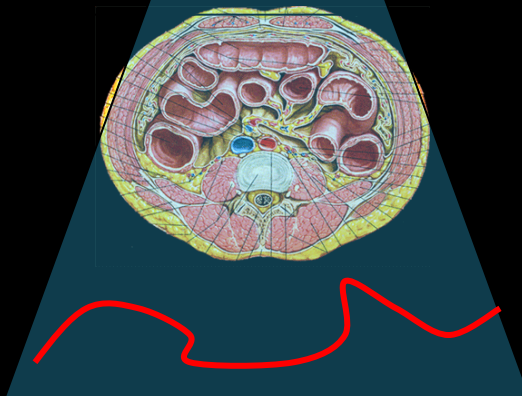
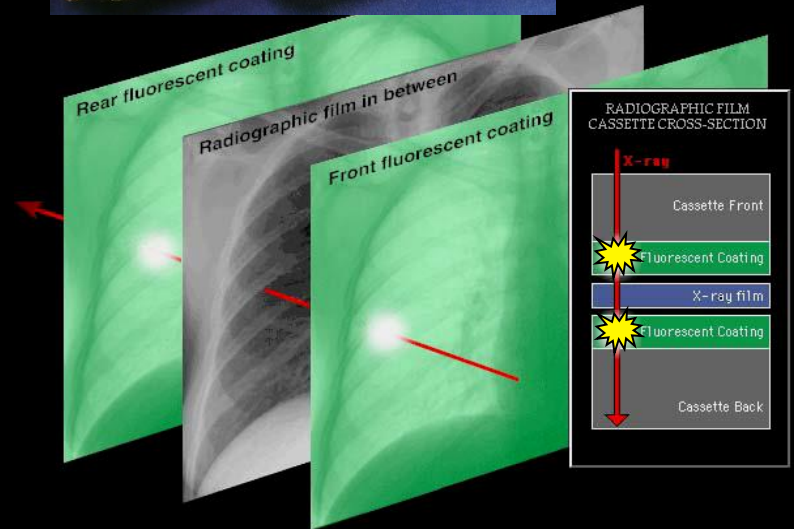
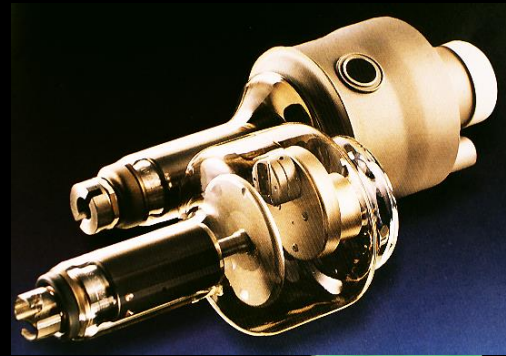
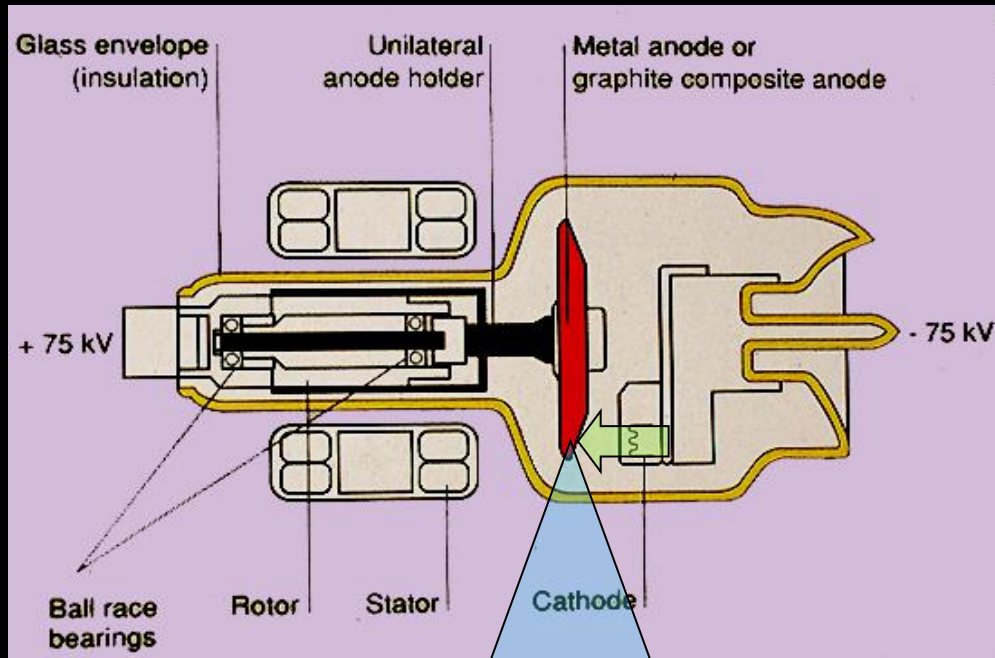


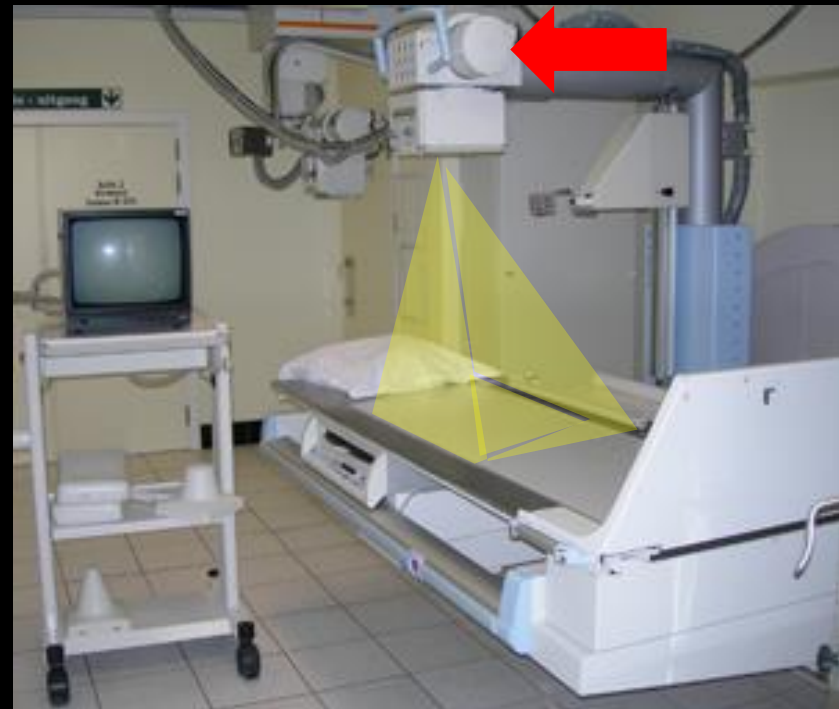
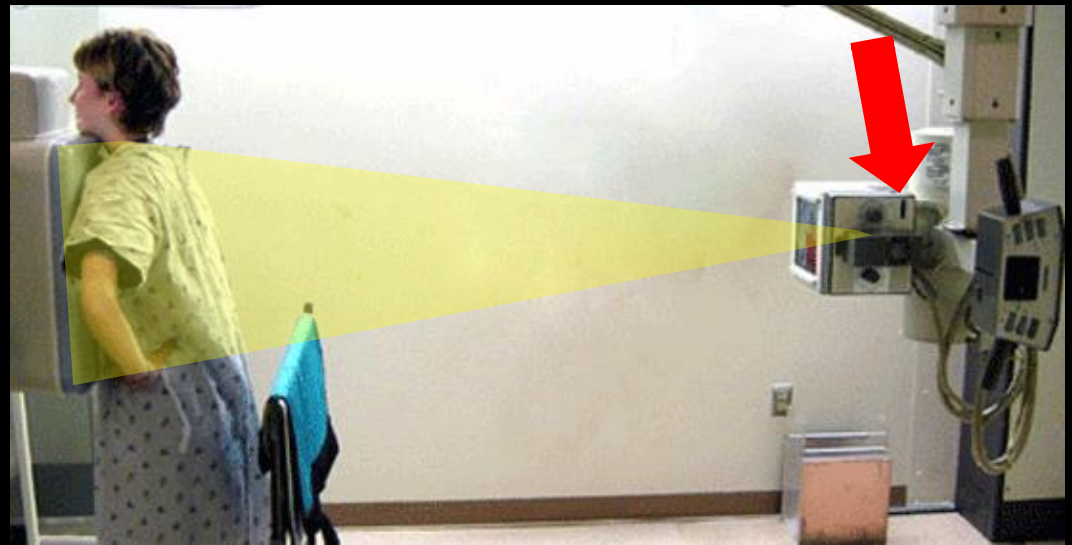
durée de l'exposition
~ 10 secondes



durée de l'exposition 1
à 10 millisecondes







géométrie des faisceaux X en imagerie
par projection (radiographie
"conventionnelle")

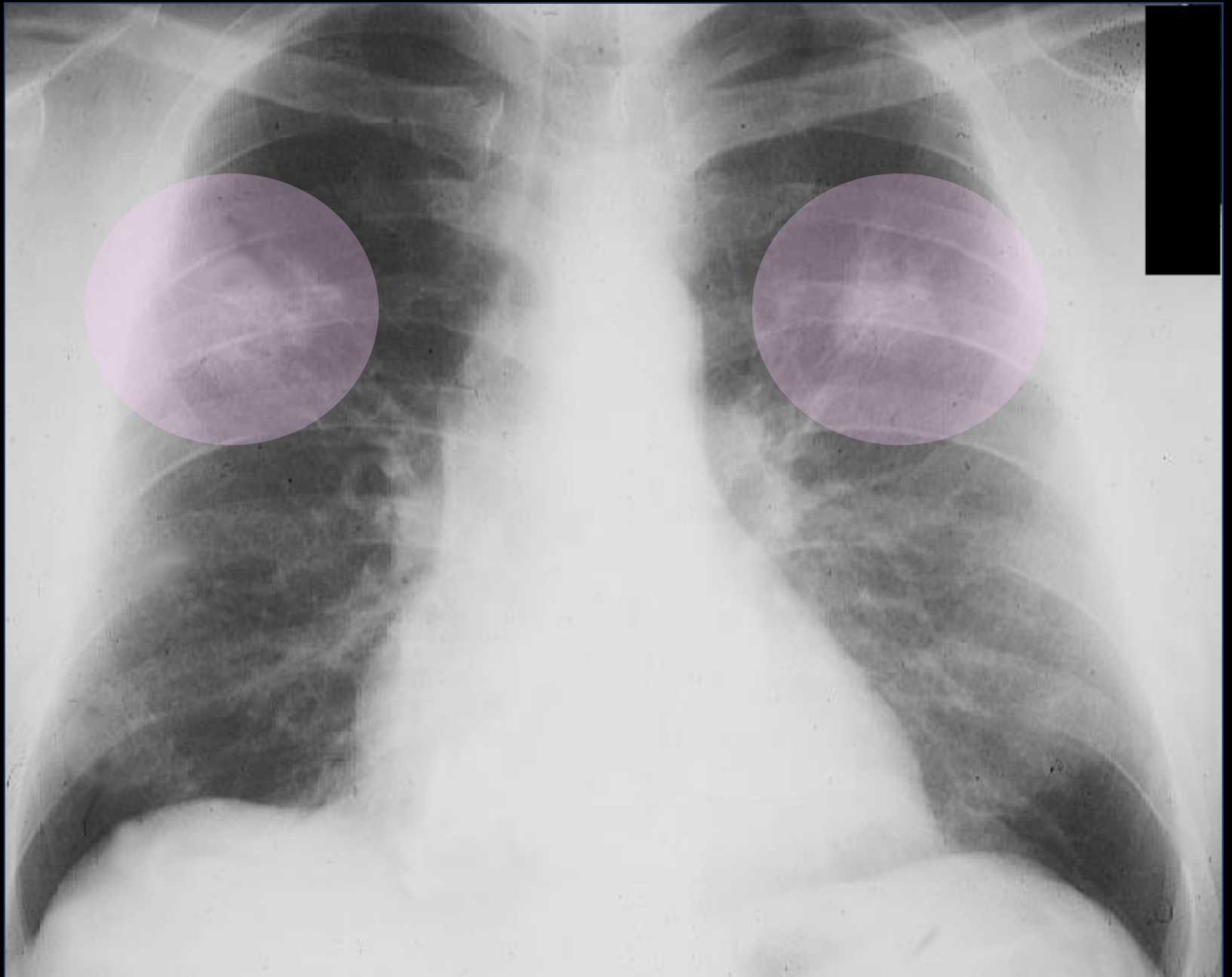
2 images thoraciques "normales" !!!

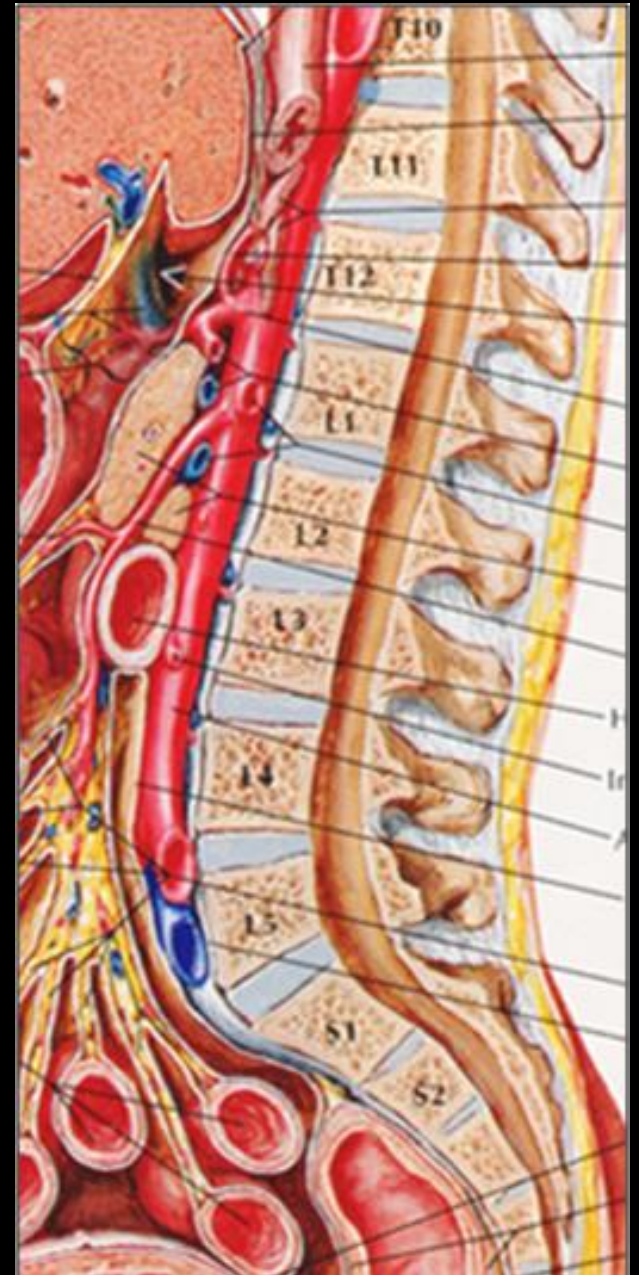


23 ans

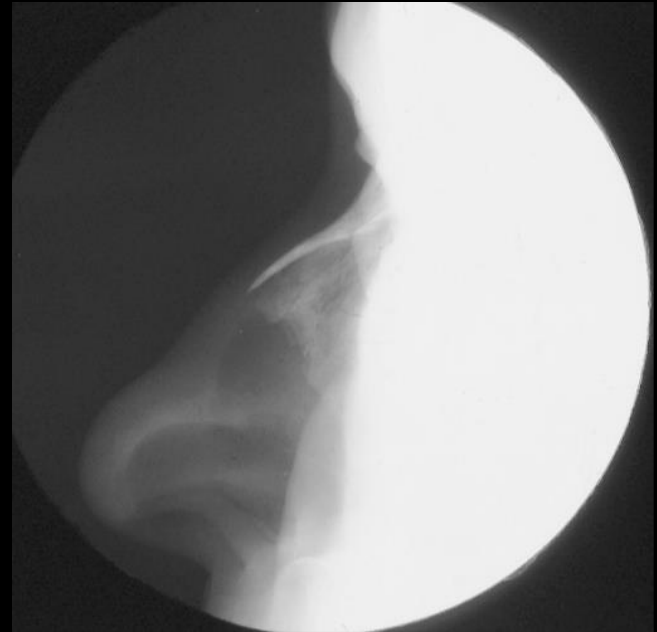


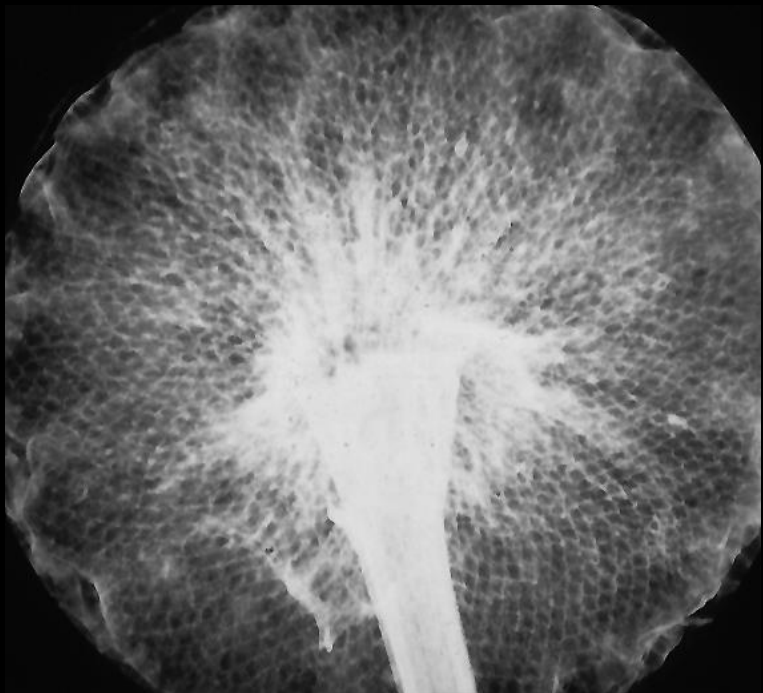
72 ans





être conscient de ce que l'on ne voit pas ! corps de L5





radiographies de plantes

28 kV anode molybdène





radiographies de tableaux



Évolution récente de la radiologie "conventionnelle" : la numérisation

Objectifs :

-faciliter le stockage et la communication des images

PACS picture archiving and communication in
medicine

format **DICOM** digital imaging communication in
medicine

-permettre une lecture plus facile des informations

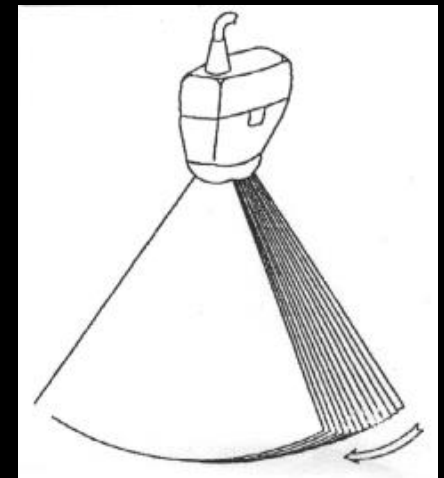
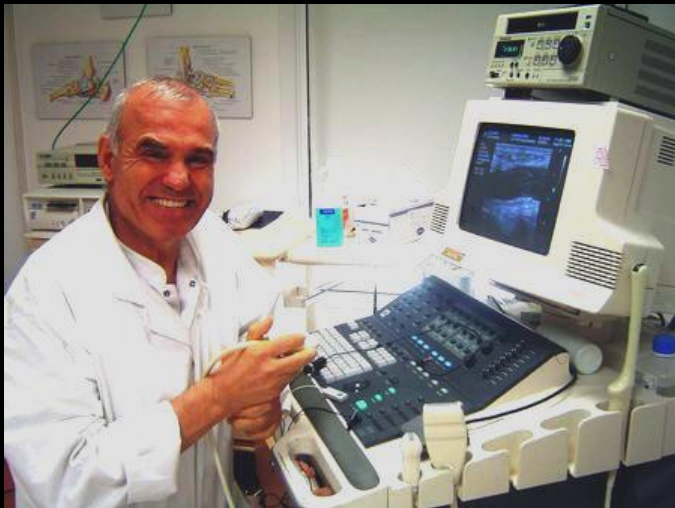
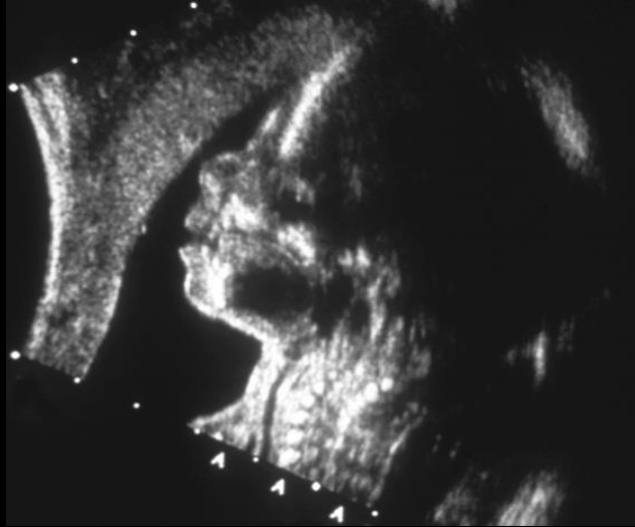
. fenêtrage

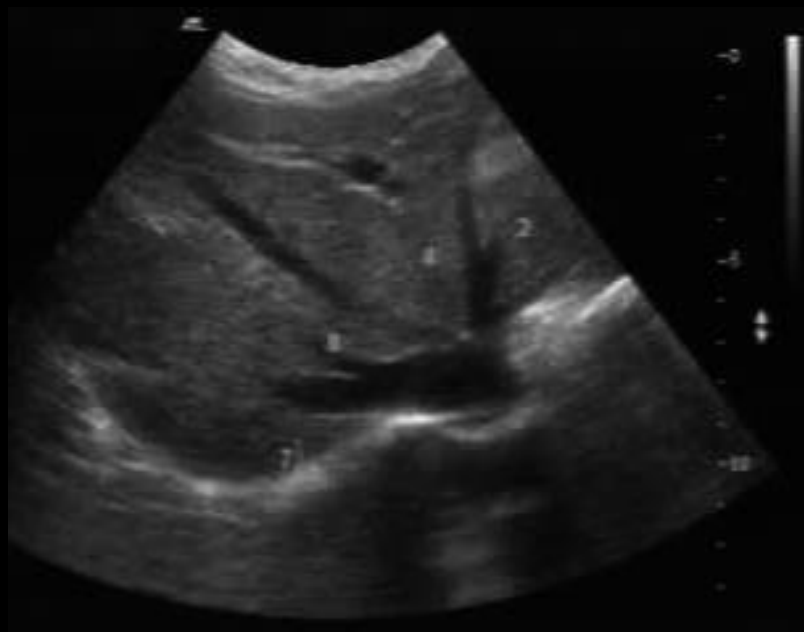
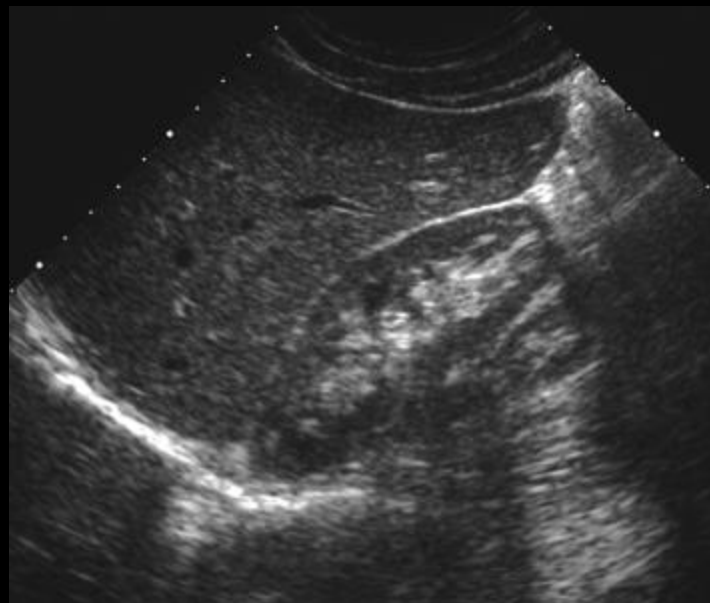
. agrandissement

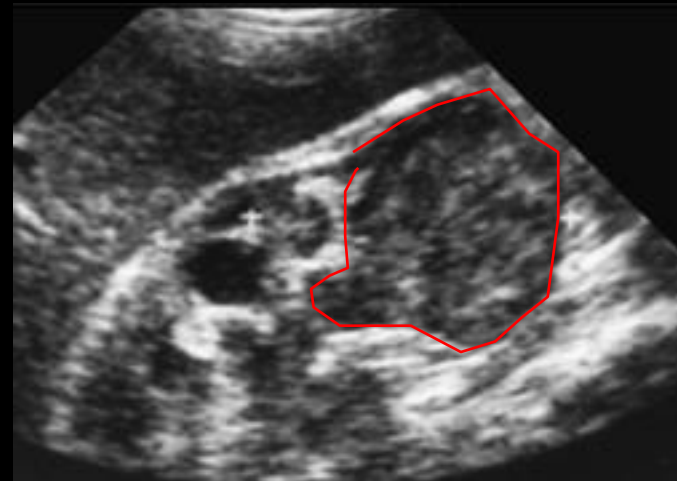
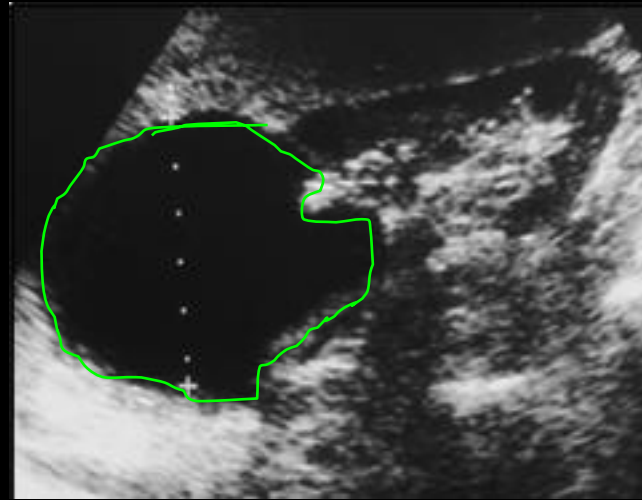
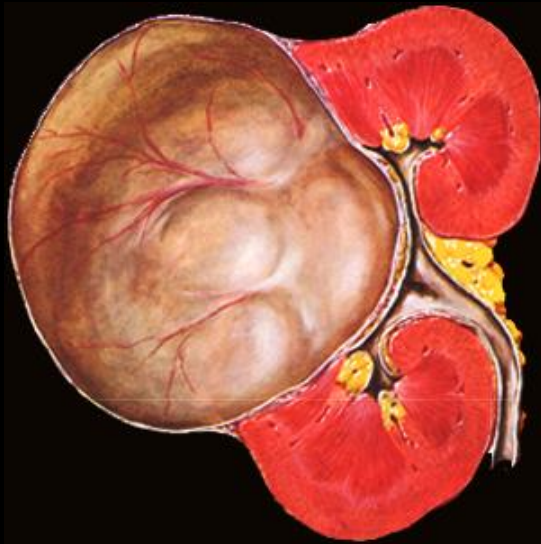
L'hôpital moderne doit fonctionner sans films et sans
papier (film less and paper less)



L'imagerie par ultrasons : échographie et Doppler



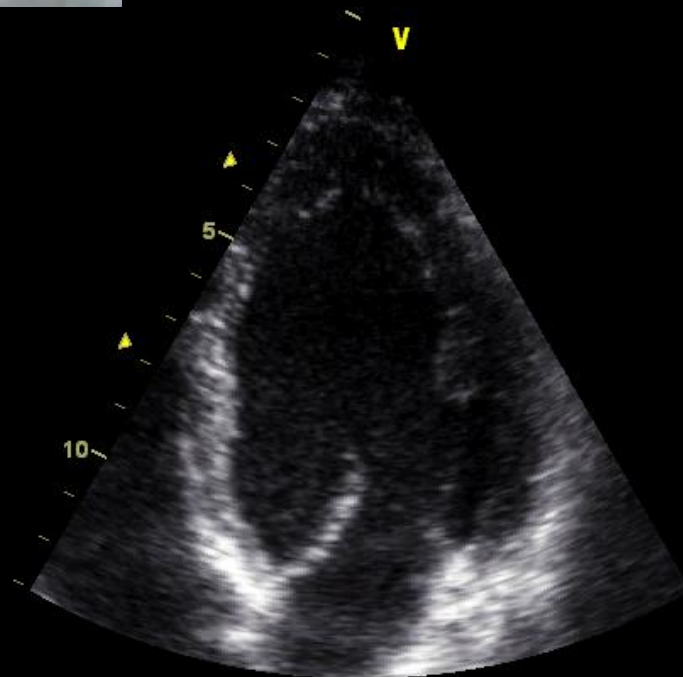
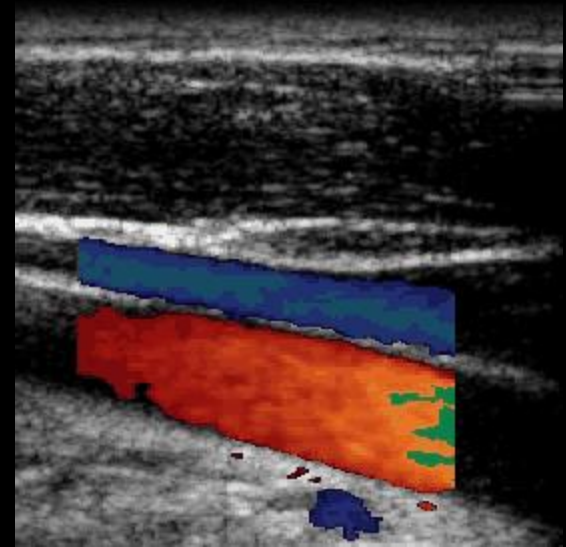




kyste et masse solide (carcinome à cellules claires) du rein

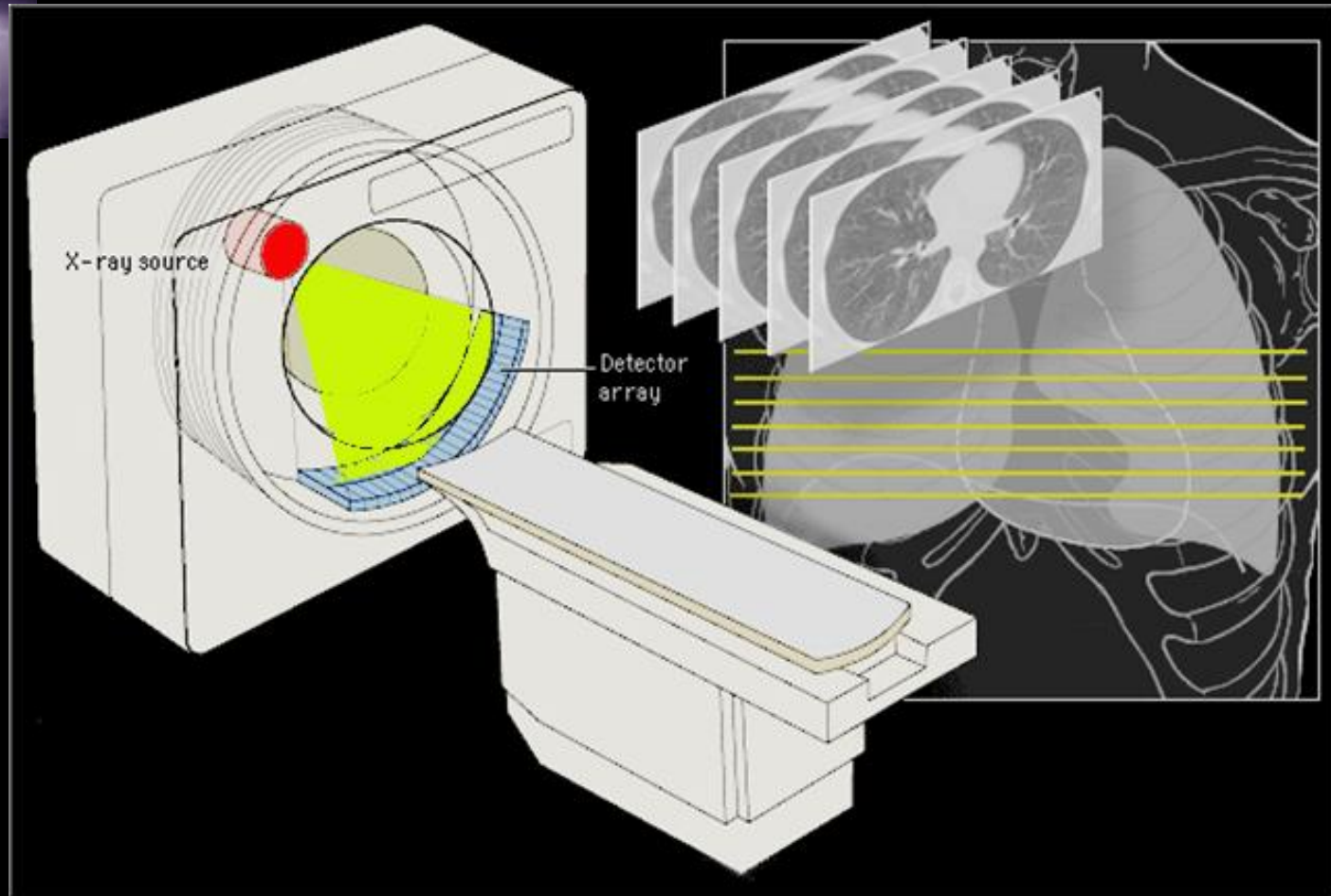


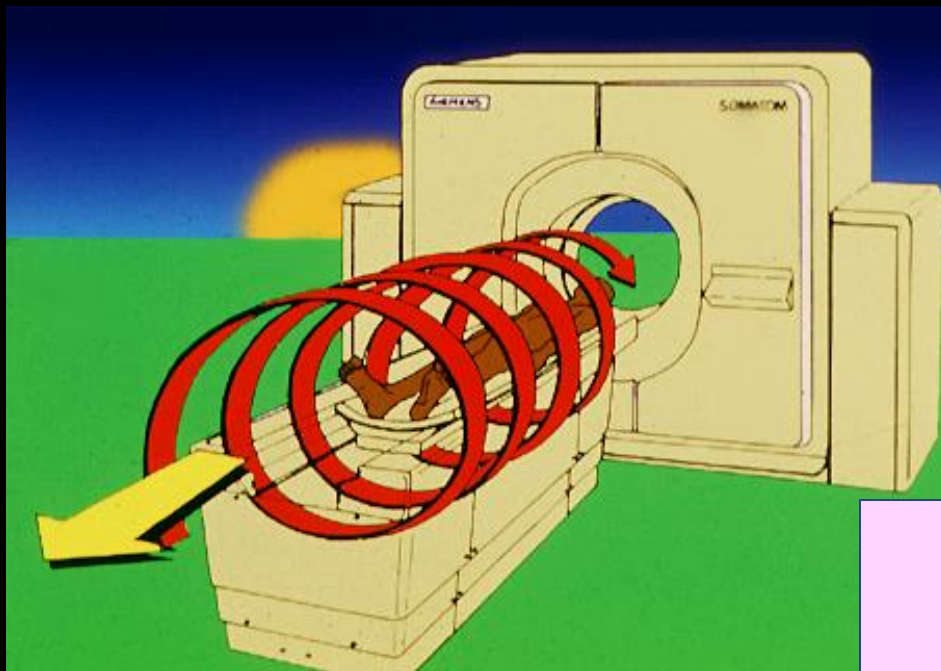
01/03/2007 16:13:45



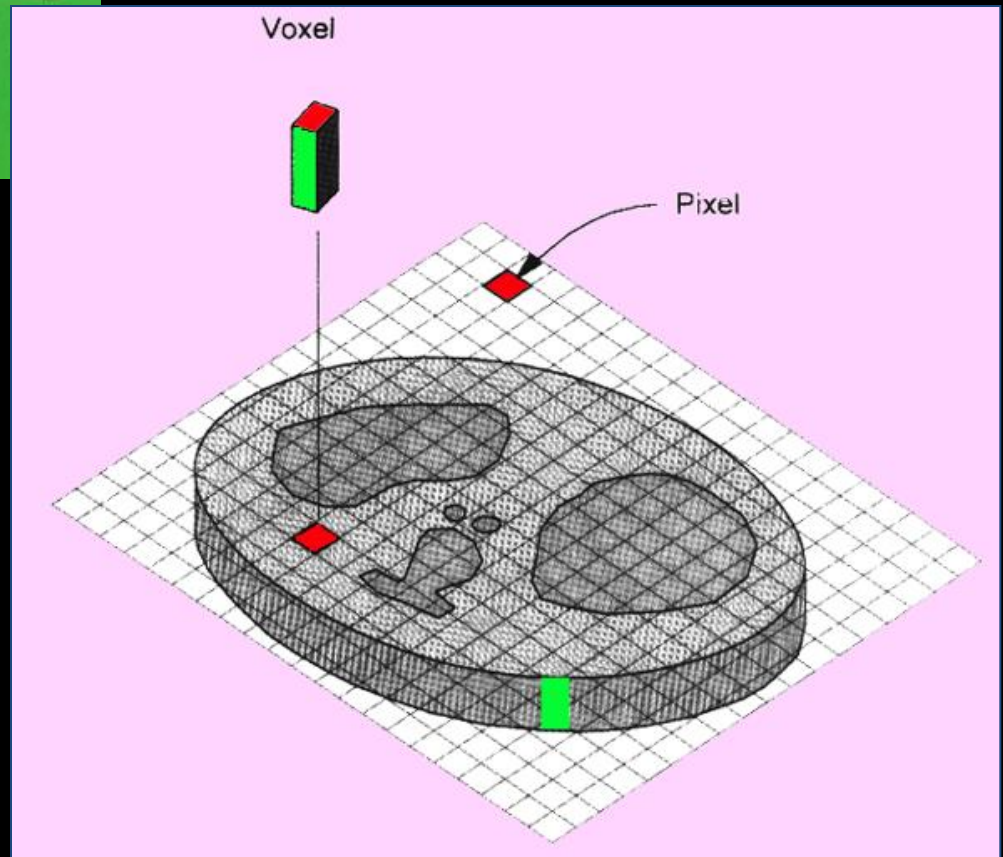
71
2:152 HR

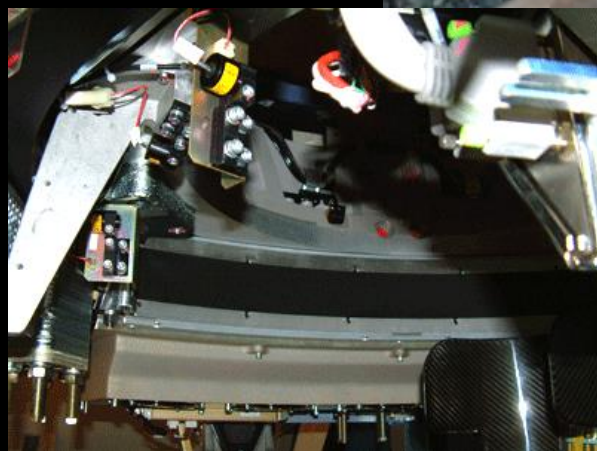
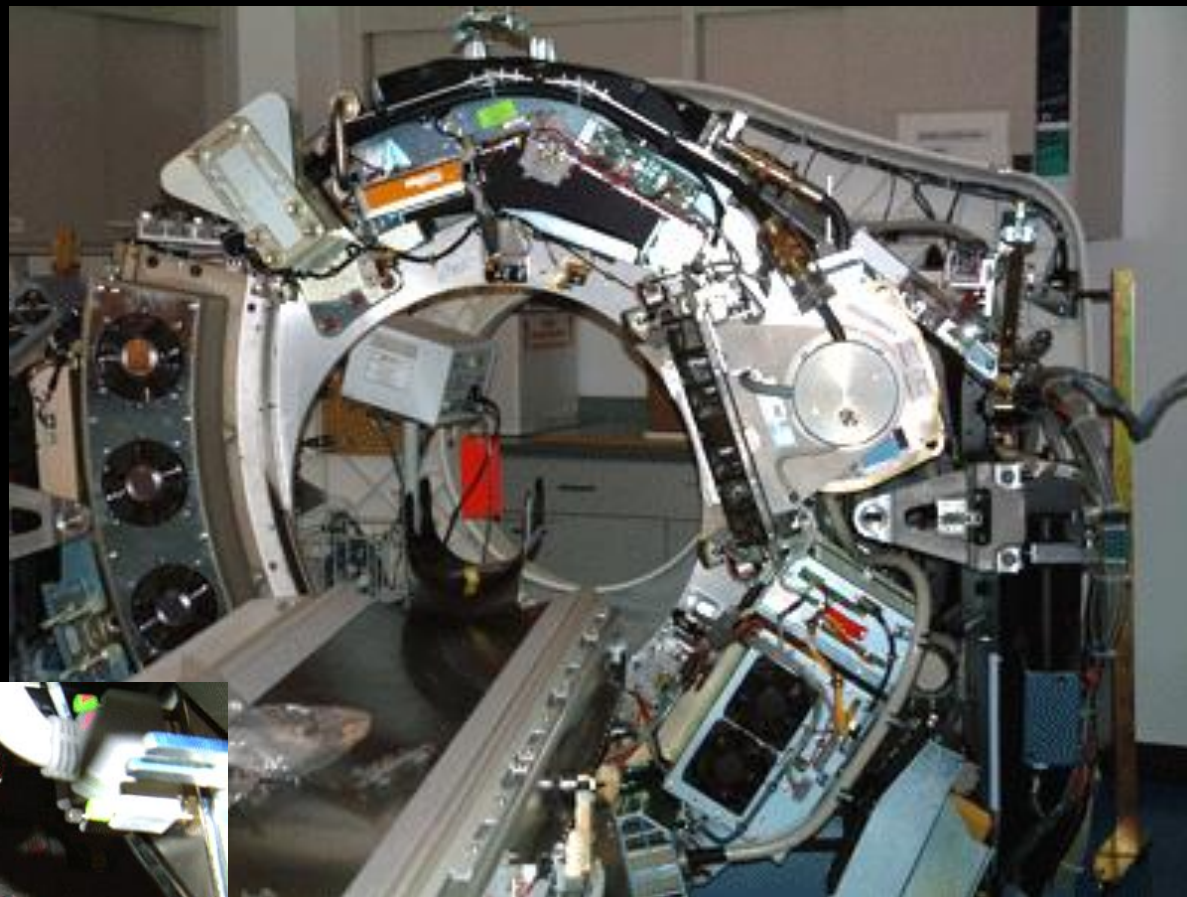
L'imagerie par scanner à rayons X ("scanner" ,
scanographie , tomodensitométrie, CT scan ...)





rotation de l'ensemble tube - détecteur
 +
 translation du plan de la table
 = acquisition **hélicoïdale** (spiralee)





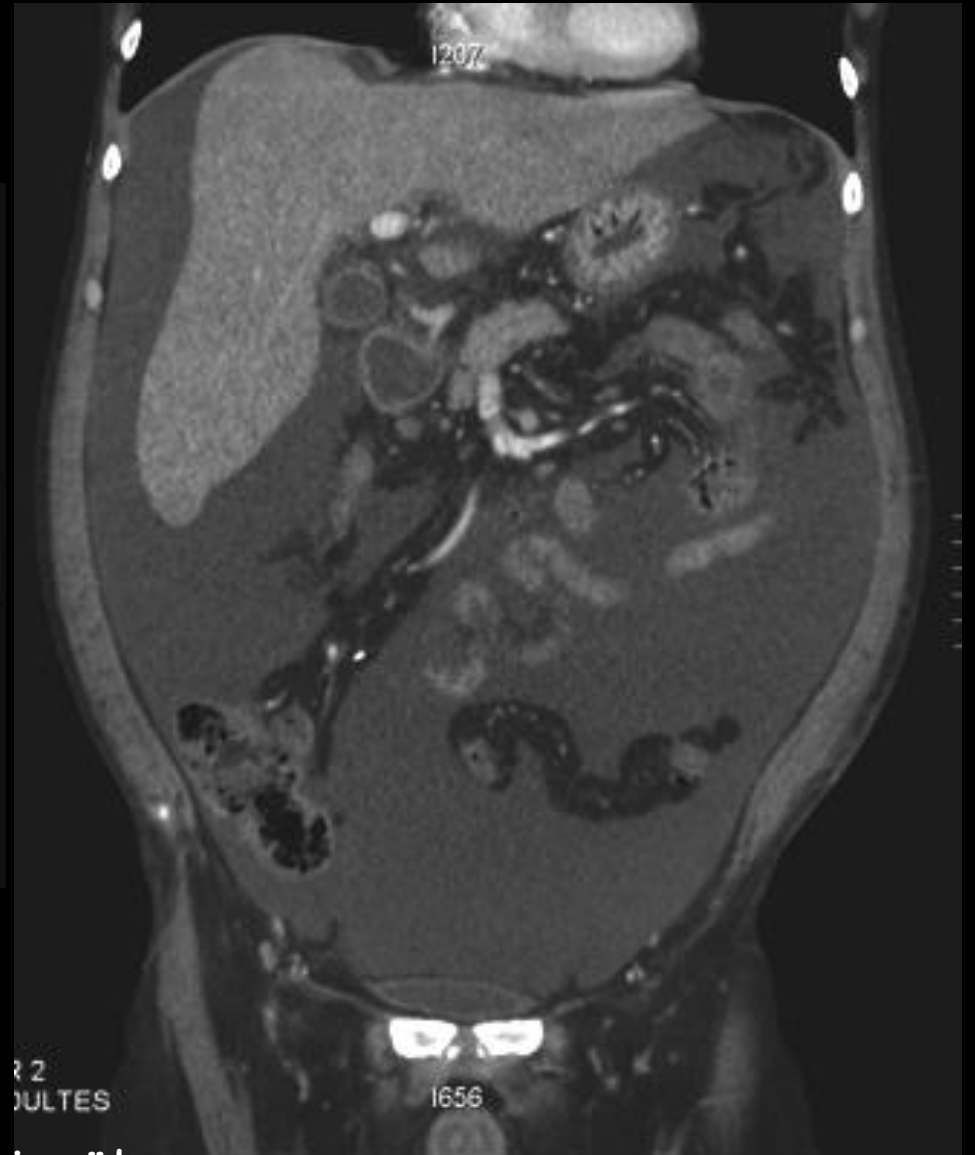
CT scan VCT 64 canaux détecteur 40 mm



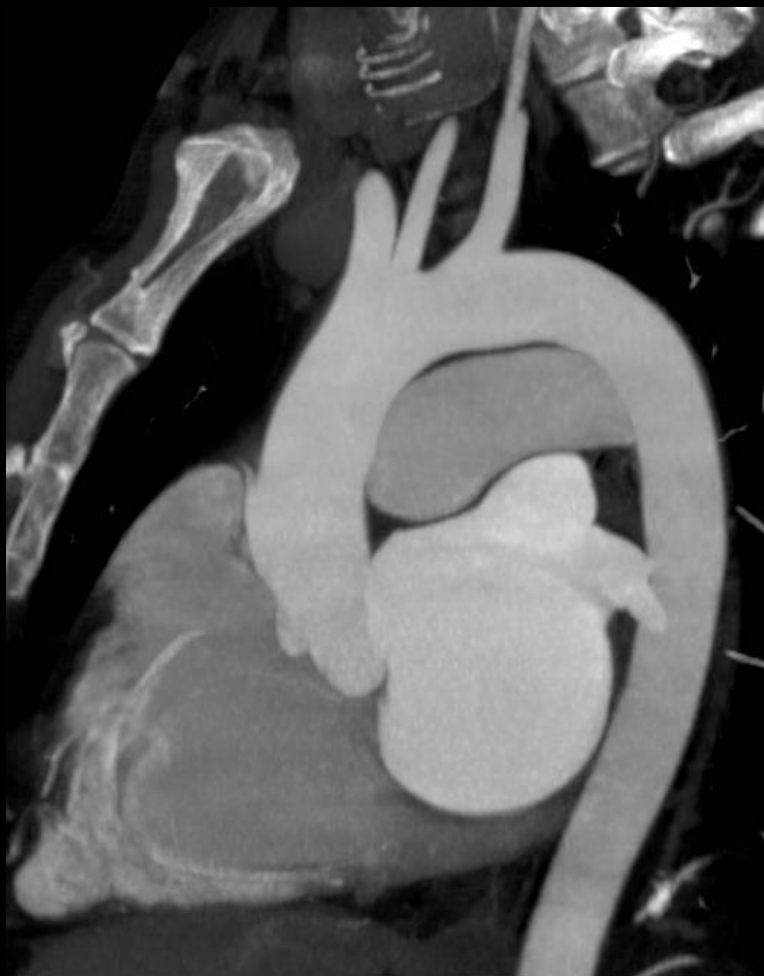
0.8 sec/360°



0.5 sec/360°

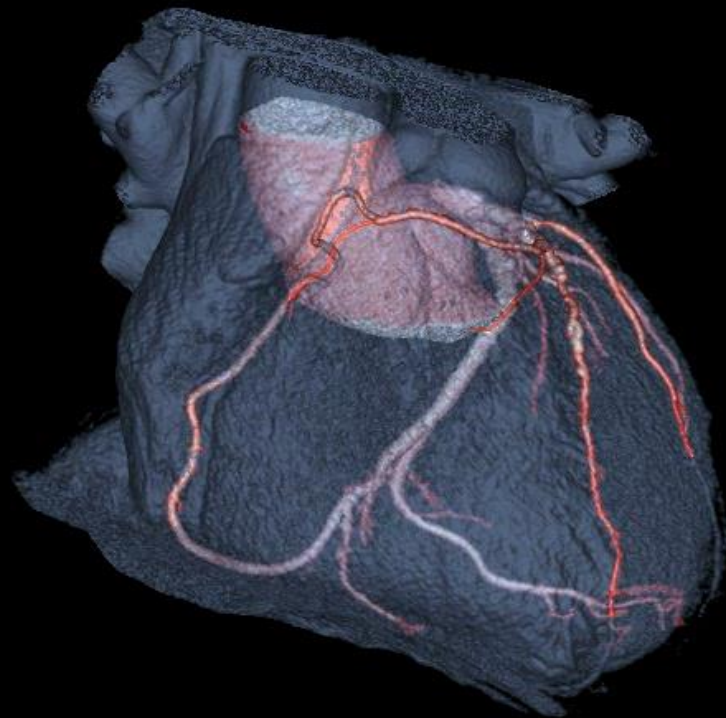
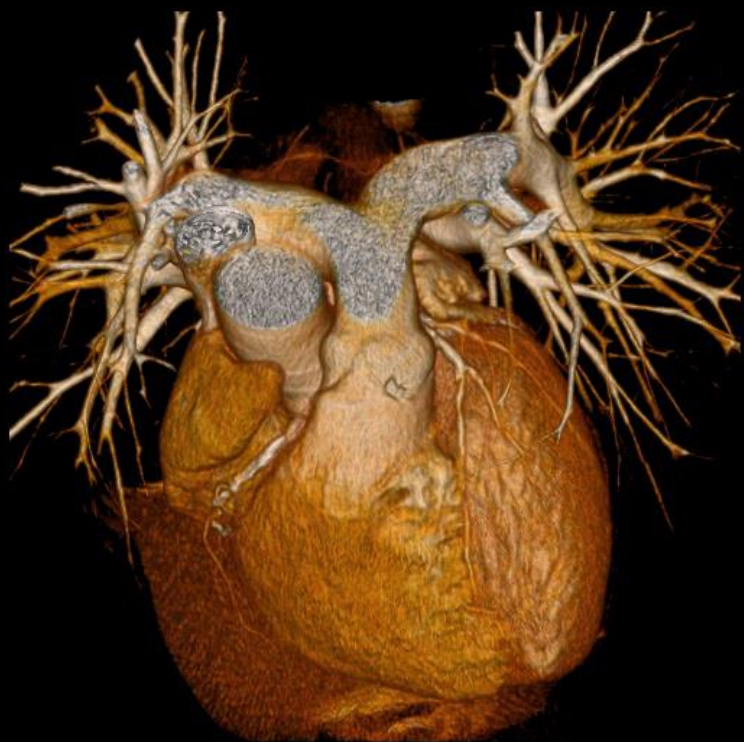


ascite libre abondante ; mésentère , mésosigmoïde

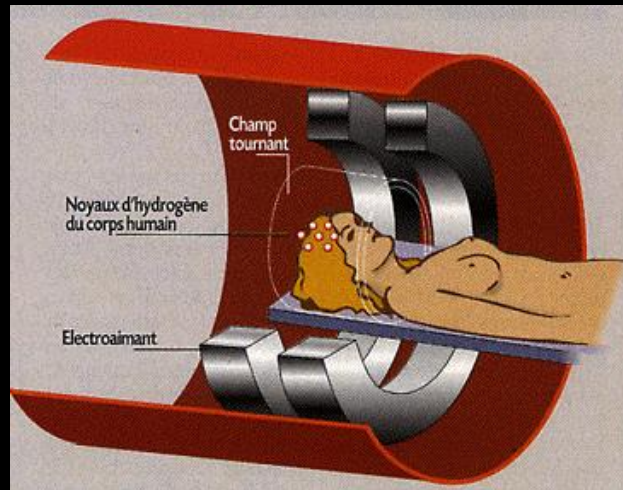
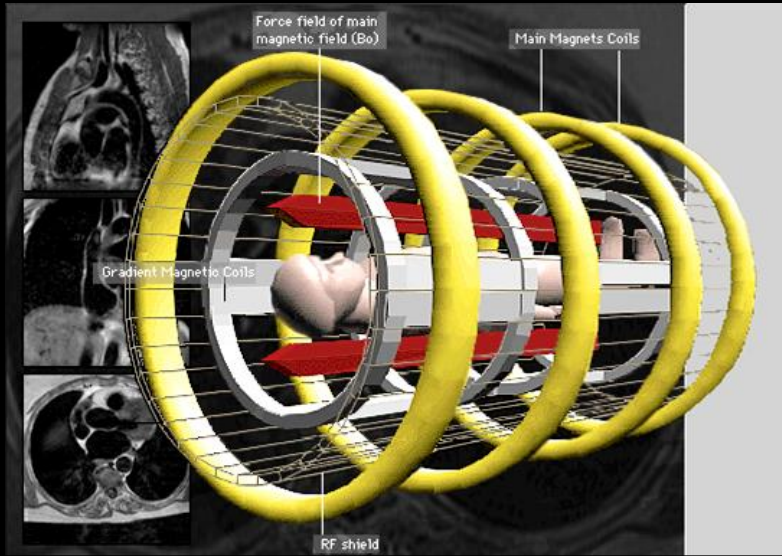








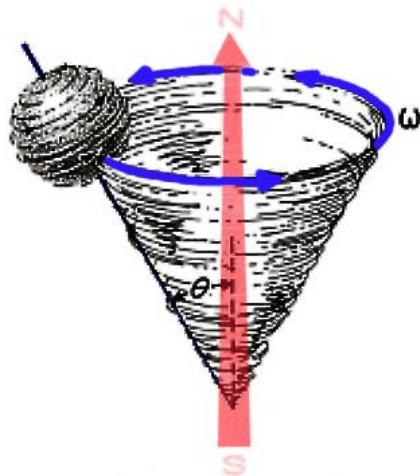
4. L'IRM = imagerie par résonance magnétique nucléaire du proton



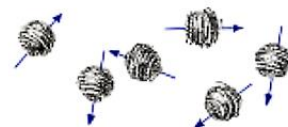
[A] Field OFF



[B] Field ON



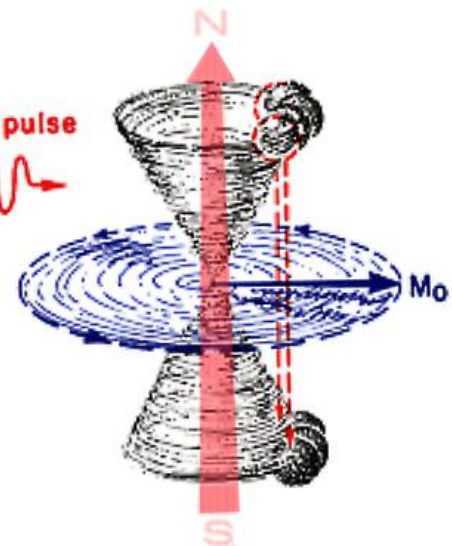
[A] Field OFF

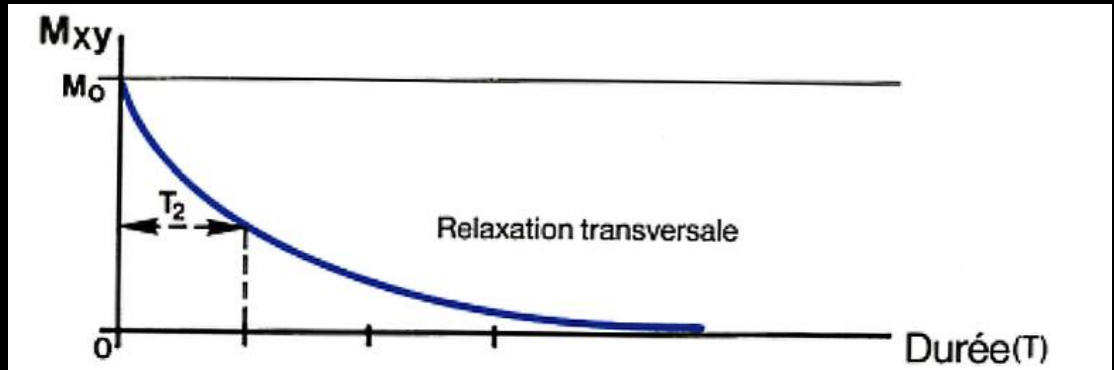
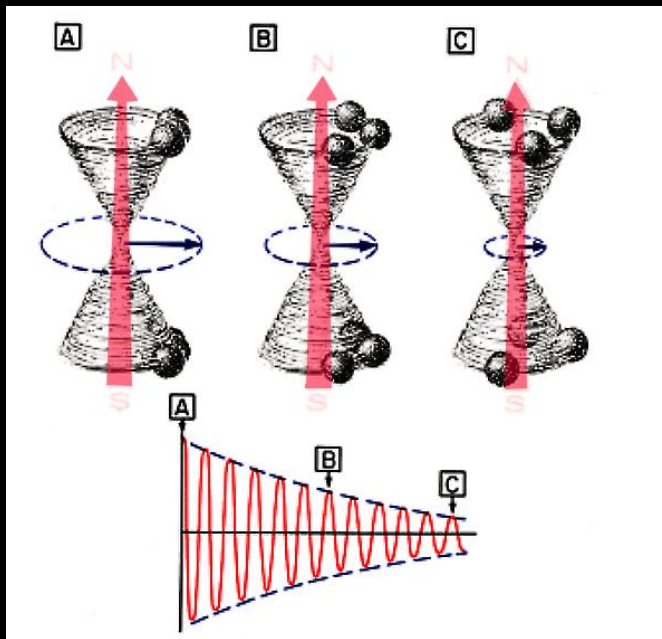


[B] Field ON

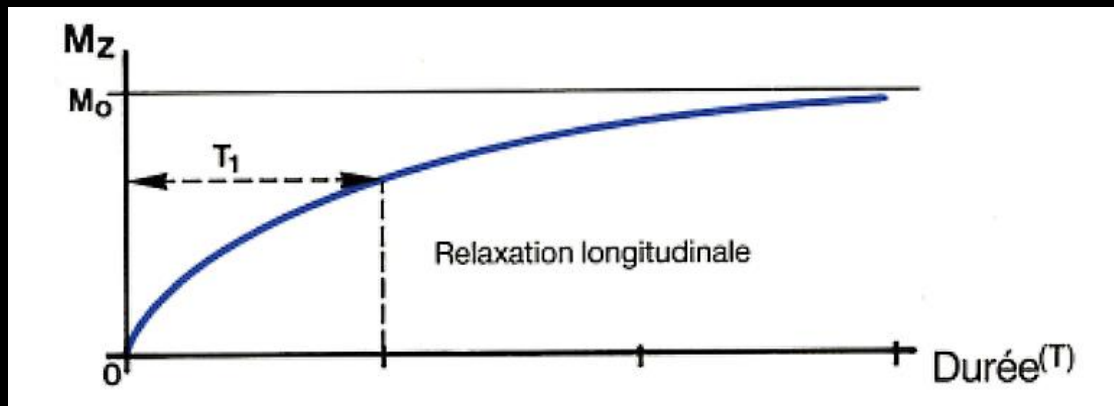
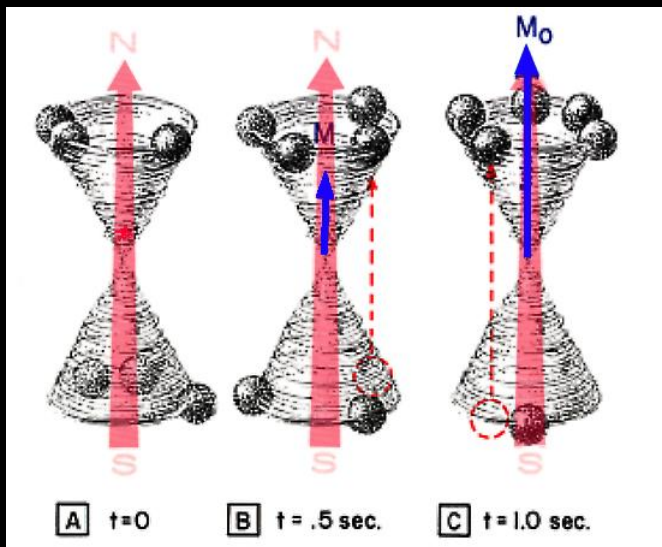


RF pulse

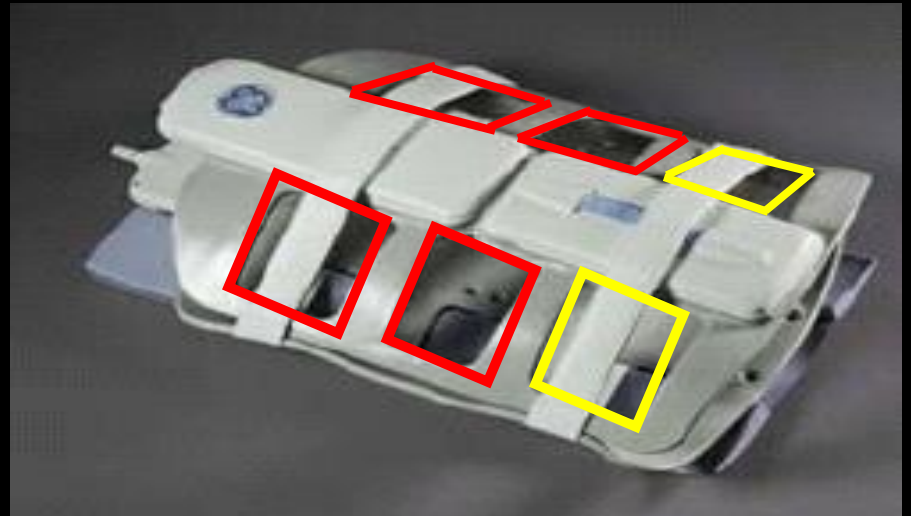




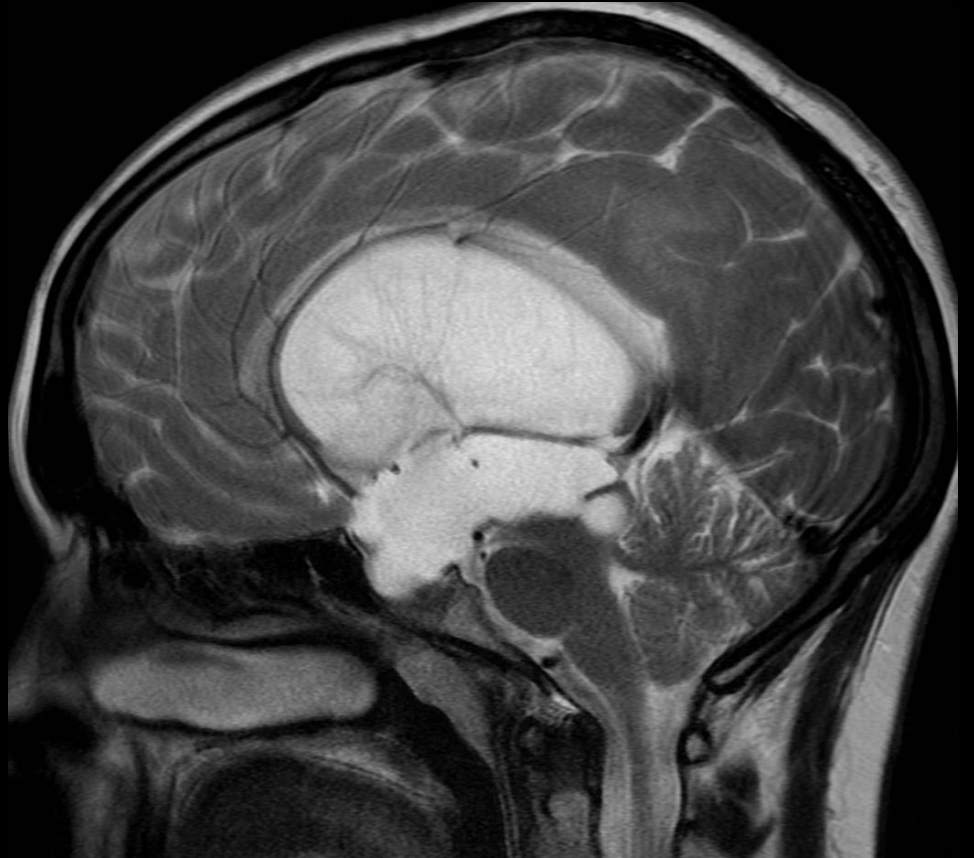
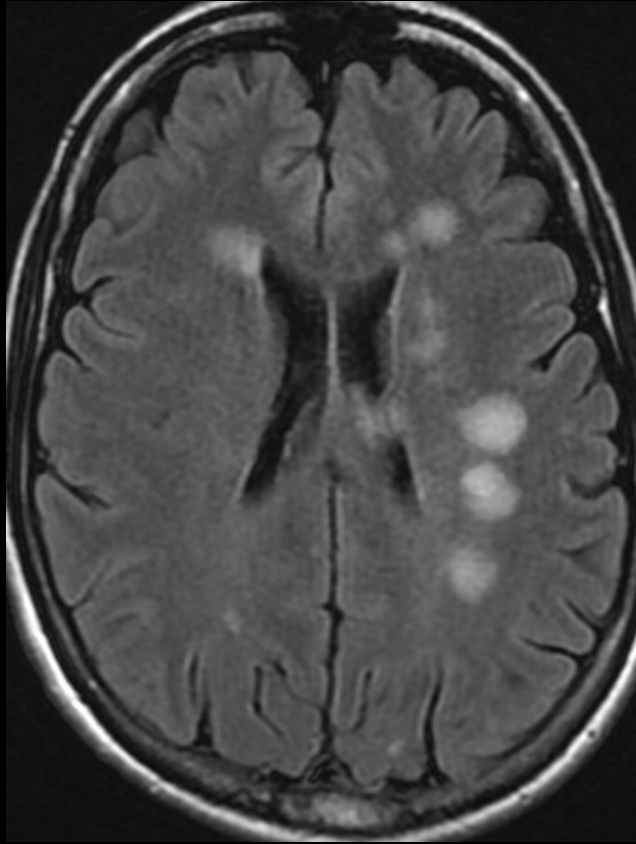
T_2 = relaxation transversale

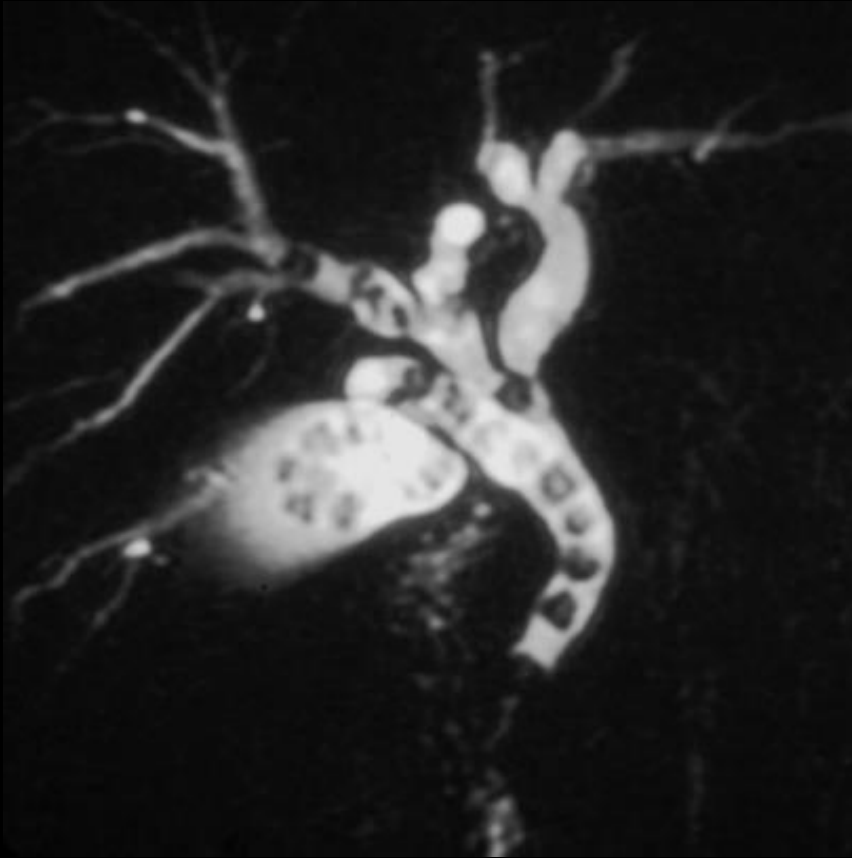


T_1 = relaxation longitudinale

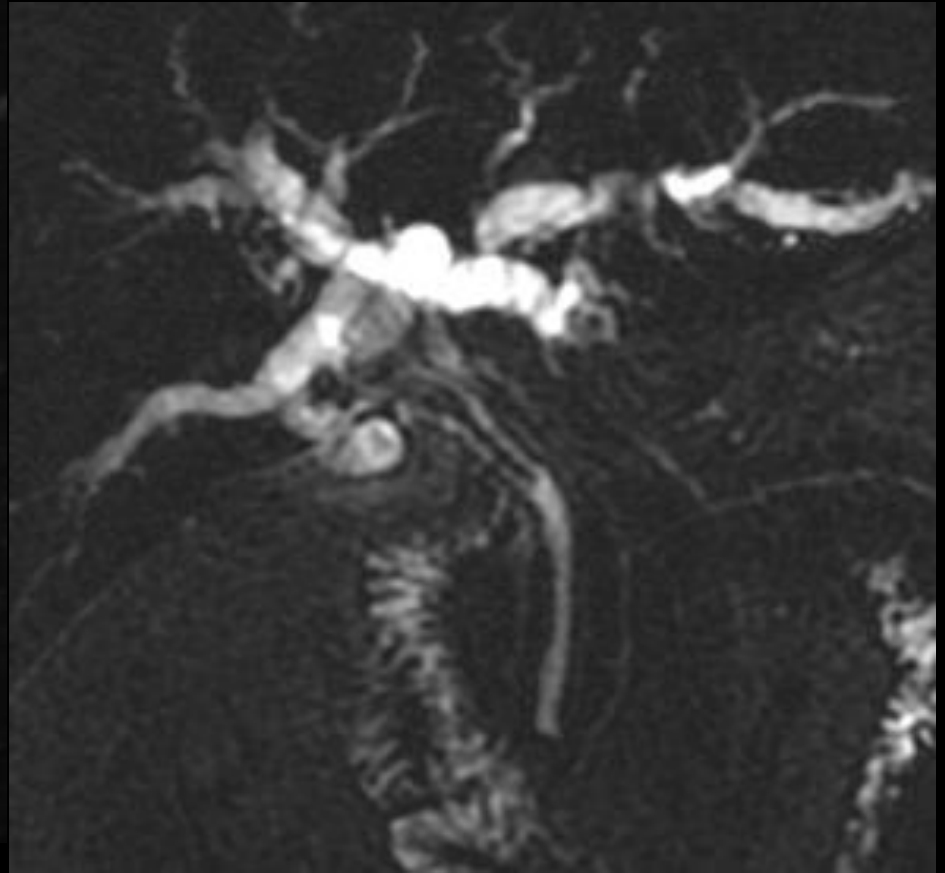


antennes de surface "en réseau phasé" (phased array)





calculs biliaires (vésicule , VBP et VBIH



cholangiocarcinome infiltrant du canal hépatique

CP-IRM cholangio-pancréatographie IRM

pondération T2 maximale; hypersignal des fluides stationnaires (hydro-MR)

5. La tomographie par émission de positons

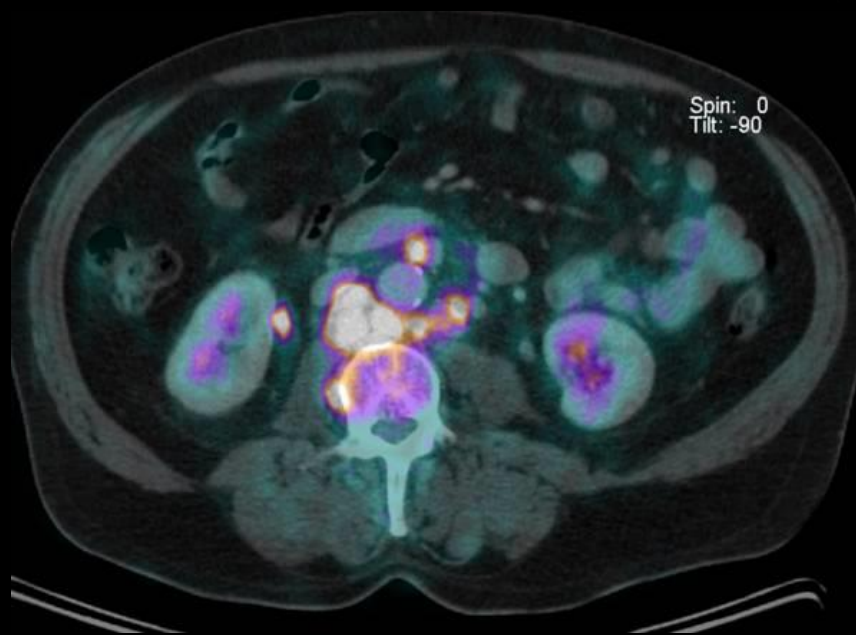


fabrication de ^{18}F fluor

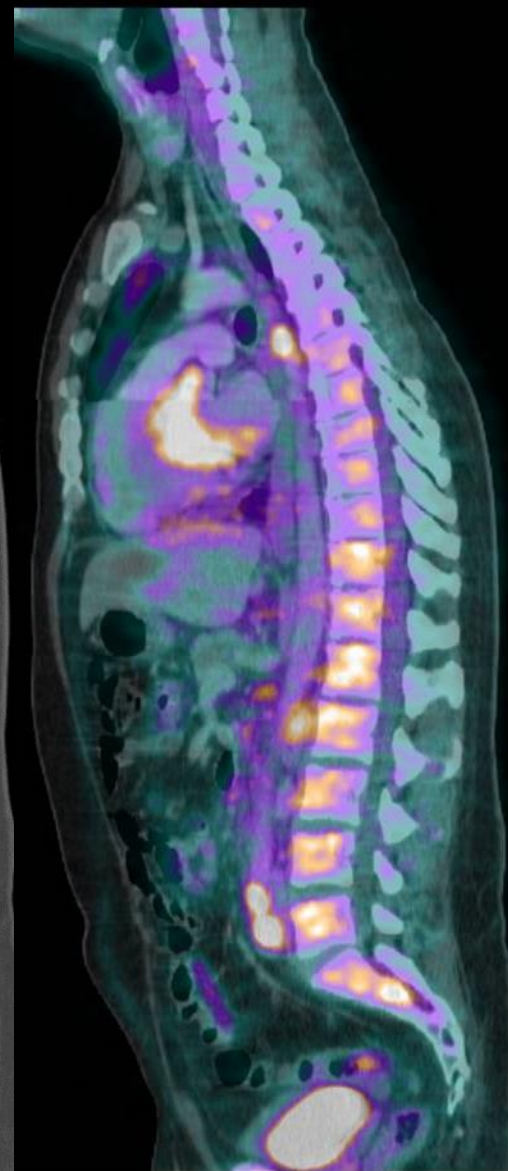
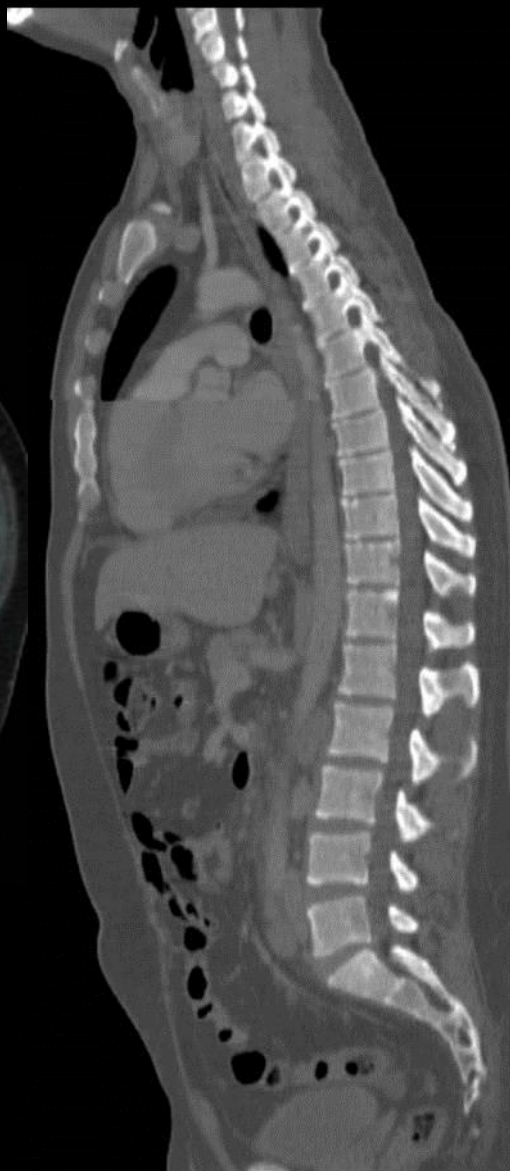
marquage du déoxyglucose : ^{18}F FDG

ou d'autres traceurs ^{18}F DOPA

couplage avec CT : techniques hybrides



LMNH B diffus à grandes cellules



6. scintigraphies et SPECT-CT

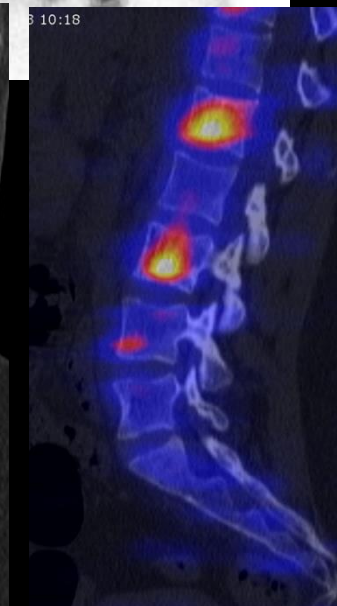
utilisation de **traceurs** qui permettent explorer des processus métaboliques définis, de façon plus ou moins spécifique

les molécules du traceur sont "**marquées**" par un émetteur gamma qui, dans **95 % des scintigraphies est le ^{99m}Tc**

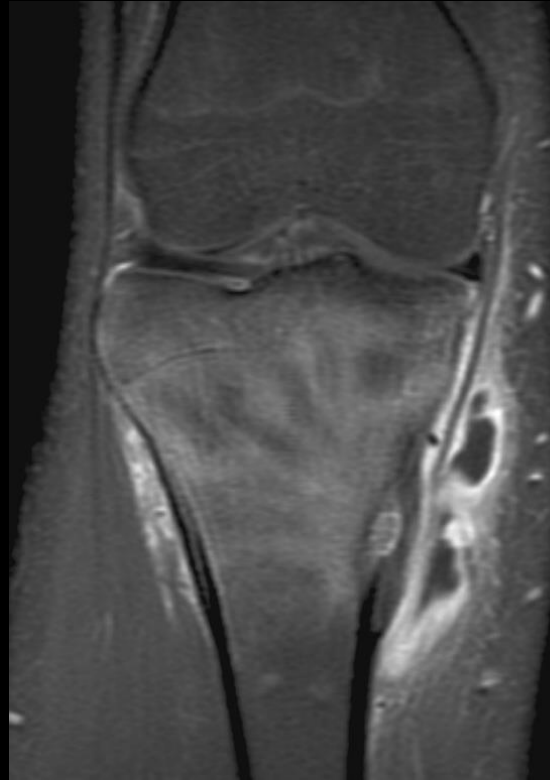
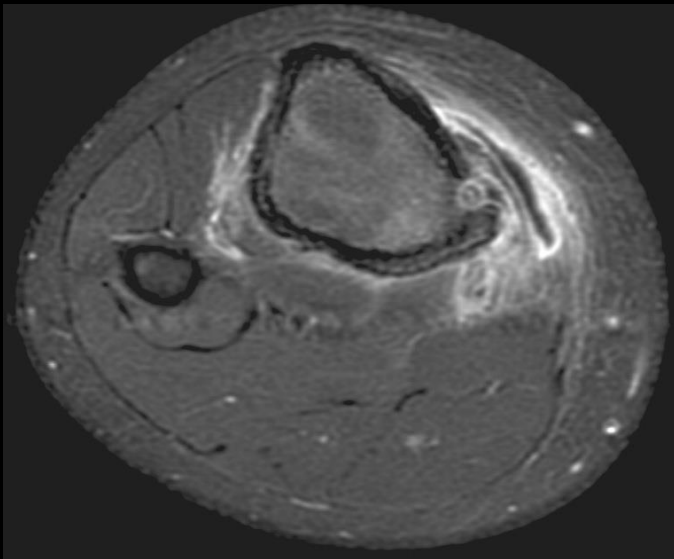
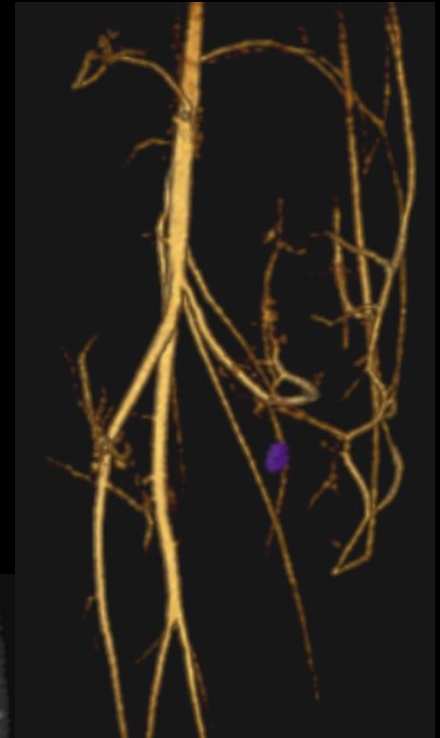
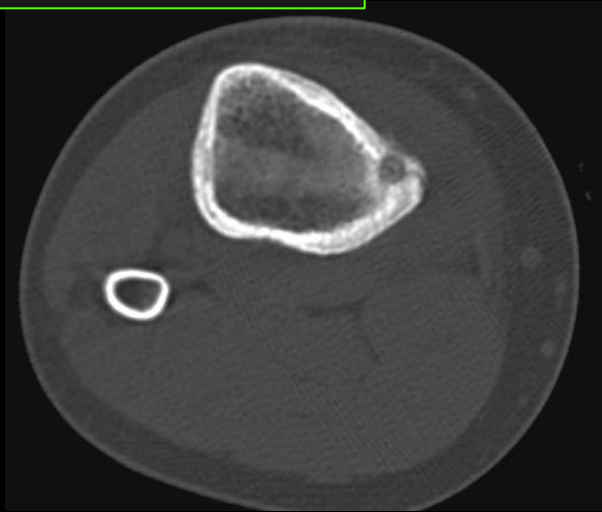
la **scintigraphie** classique est une méthode d'exploration volumique qui, selon le traceur utilisé peut explorer le "corps entier" (scintigraphie osseuse au ^{99m}Tc DMP), ou explorer plus spécifiquement un organe ou un groupe d'organes (scintigraphie myocardique, scintigraphie thyroïdienne, ^{131}I MIBG ...)

le **SPECT** est une modalité de recueil particulière du signal émis par le marqueur permettant de reconstituer au sein de l'organe examiné des coupes parallèles. Le couplage avec un scanner permet la fusion des coupes isotopiques et radiologiques

maladie de Paget multifocale dont 2 localisations sur le rachis lombaire



7. imagerie multimodalités



ostéome ostéoïde
juxta articulaire