Tips & Tricks for Safe CT Scans – Good Habits to Develop



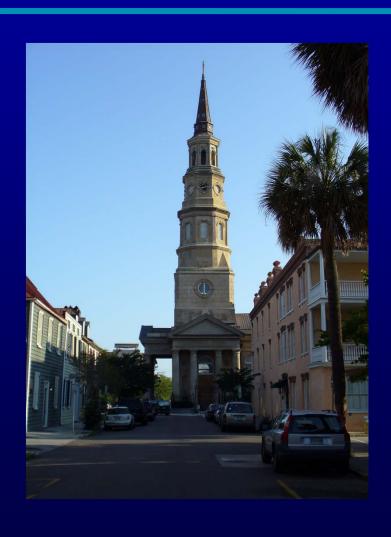
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Technologist roles and responsibilities

Proper positioning

Technical tricks

Knowing your scanner

Technologist Roles and Responsibilities





American Registry of Radiologic Technologists

R.T.(R)

Advanced certification MR, CT, M, CV





Additional State Licensure-up to the states to requires licensure, each have different requirements



H.R. 2104 CARE Bill-Consistency, Accuracy, Responsibility and Excellence in Medical Imaging and Radiation Therapy





ALARA

This is each technologists responsibility.

Important to work in conjunction with your RADIOLOGIST and PHYSICIST.



Positioning and Iso-center



Topograms or Scouts Iso-center and dose







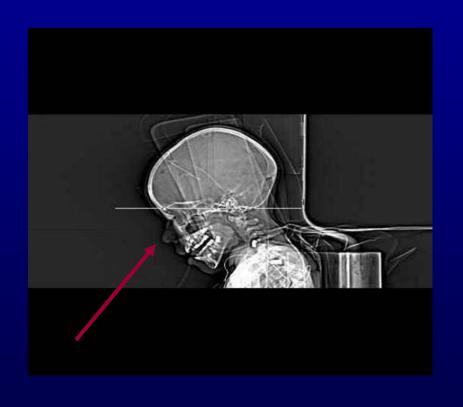
Wasted Dose!



Position
patient
correctly so
that
radiation is
not applied
to sensitive
areas

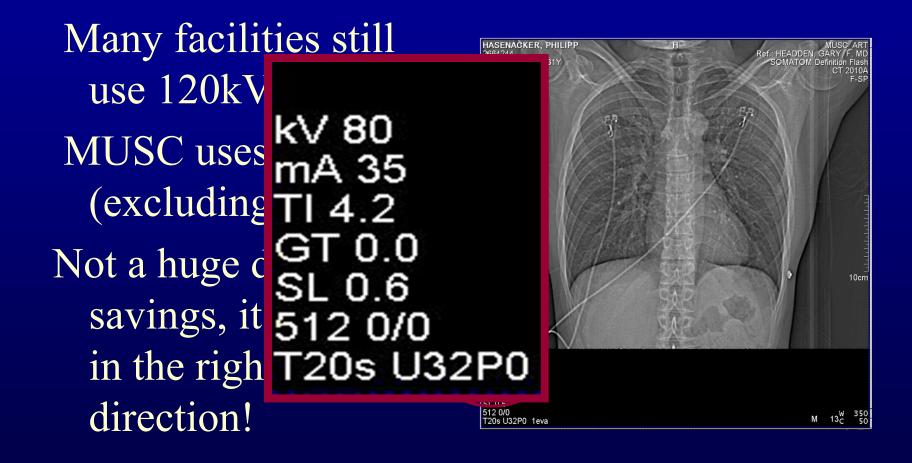






For exams like pediatric heads or neuro perfusions, position the head so the eyes are out of the primary beam.







Laser lights

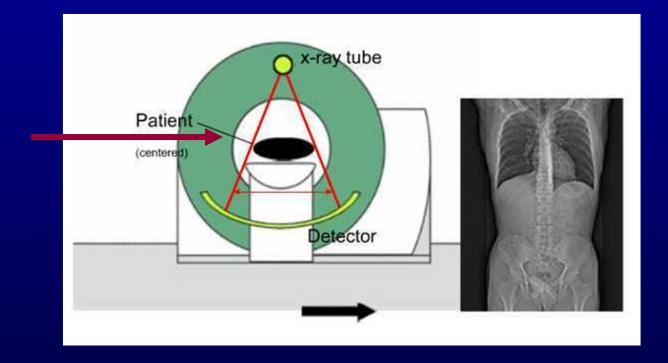
Iso-center

Important positioning tool!





Iso-center



Automated exposure control

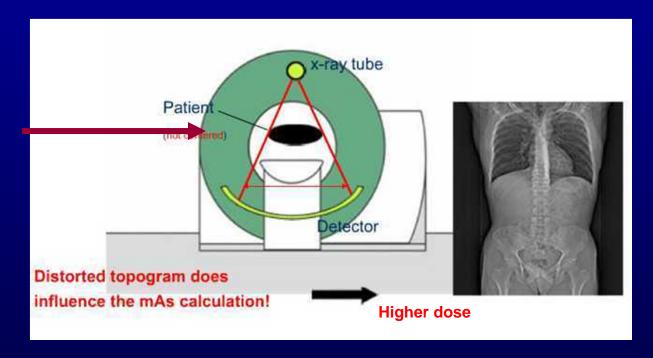
Must be iso-centered in the gantry

Assures proper dose distribution and beautiful images!





Patient too HIGH





Too high in the gantry

Assume the patient is larger

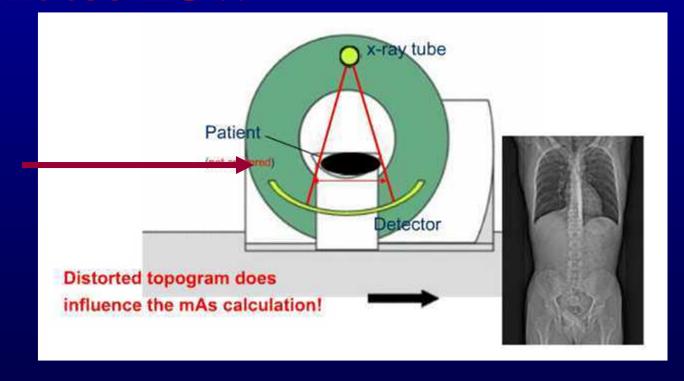
Use a higher technique



Higher dose and images with decreased quality



Patient too LOW





Too low in the gantry

Assume the patient is smaller

Calculate an insufficient dose

Poor image quality





Technical Tricks

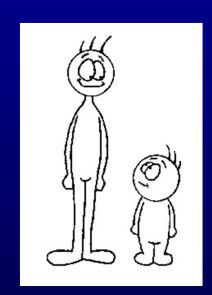




Similar to photo-timing in diagnostic radiology

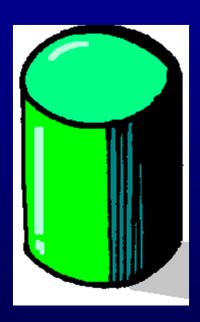
Adapts dose to the size of the patient

Positioning and iso-centering is so important!



Tube current is increased for larger patients and decreased for smaller ones.







It also does the same for different parts of your body. Humans are not shaped like a cylinder!

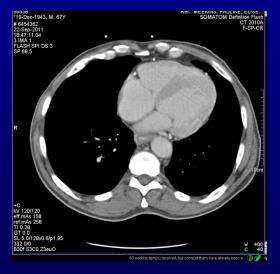


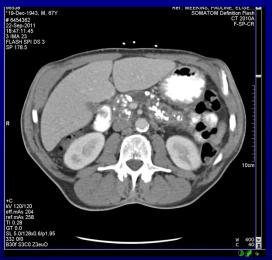




Tube current adapts to the body's size providing the proper dose!









158 mAs

204 mAs

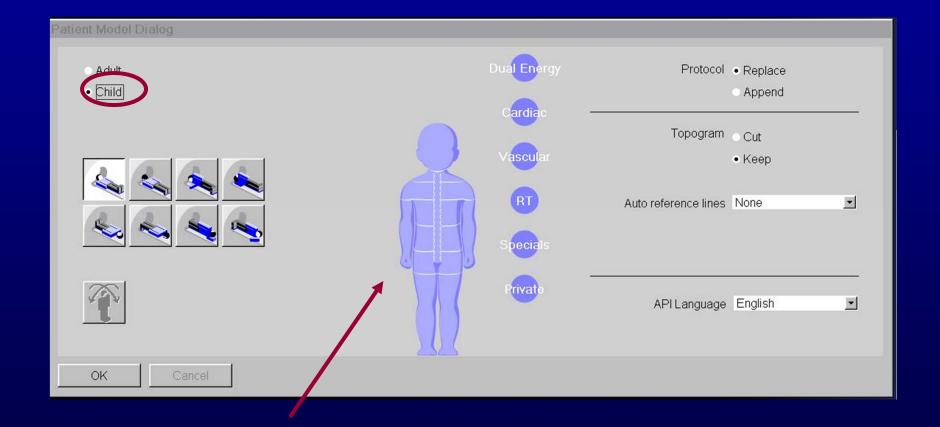
197 mAs

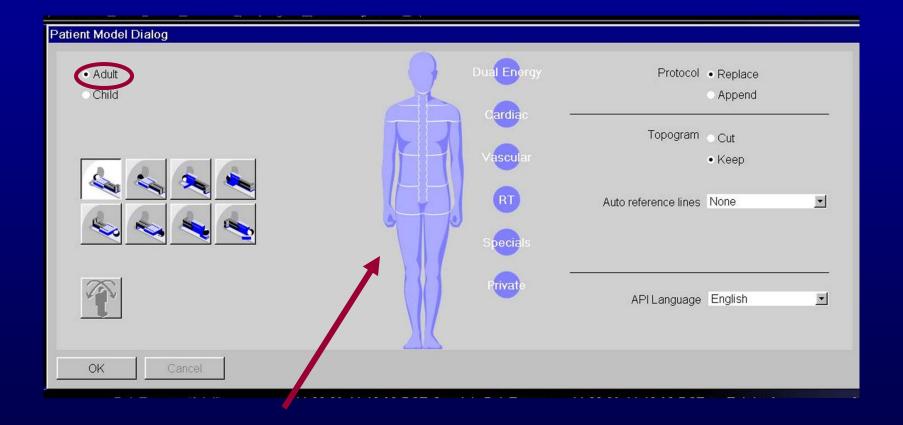
Children should

NEVER

be considered small adults!









↑ dose (mAs or kV), ↓ noise

↑ kV, ↓ noise, ↓ contrast

↓ kV, ↑ noise and ↑ contrast-especially with IV contrast





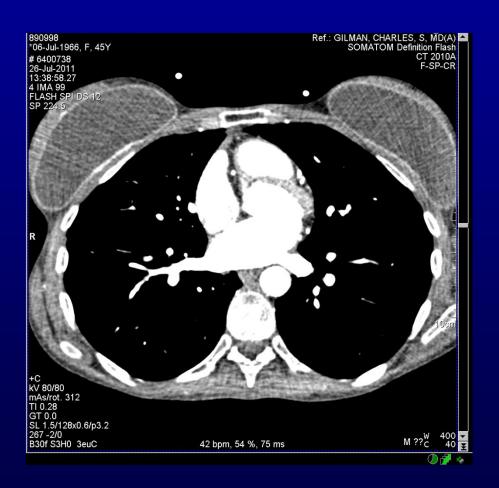
80kV and 100kV used to reduce dose

Reduce your dose by 50 to 200%!



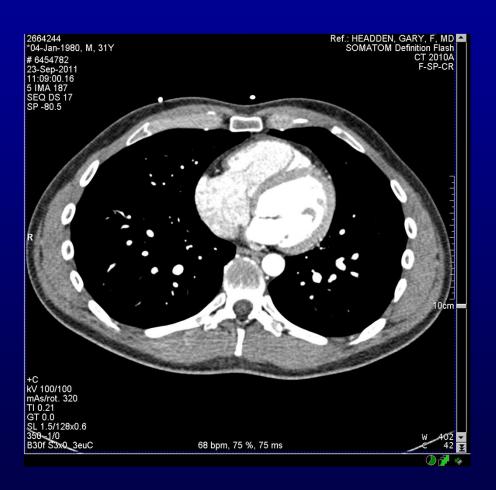


80 kVp



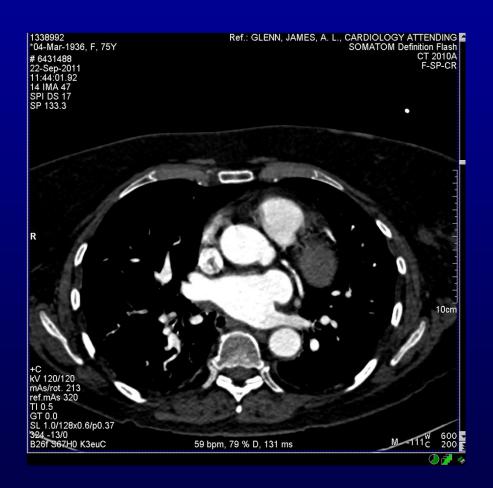


100 kVp





120 kVp



ITERATIVE RECONSTRUCTION



CT image acquired with filtered back projection Images reiterated Less image noise and better quality Helpful when using lower doses!



SIEMENS

TOSHIBA

Different technologies and approaches to iterative reconstruction.



Consult you representative

Explanations!

Strategies!





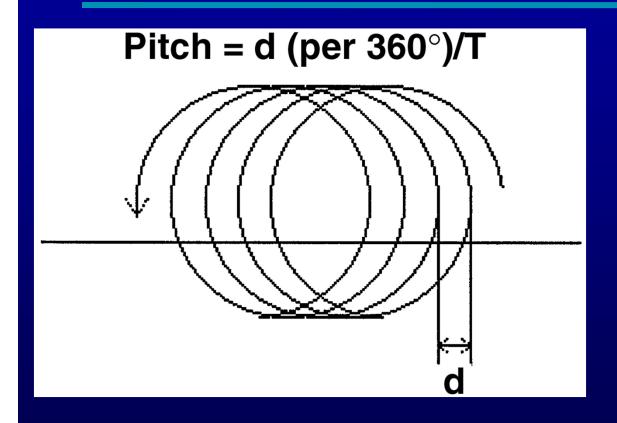
CT PITCH



Unhappy children
BIG Problem
Higher **pitch** \$\psi\$ scan time

Reduces possible repeats due to patient motion!

CT PITCH (P)



d table movement

T beam width

 $T \sim N \times 0.6 \text{ mm}$

↓P; ↓TABLE SPEED; ↑ DOSE

ROTATION TIME



Faster rotation
times

Decrease dose

Shorter scan times

Helpful in your
pediatric population

Know Your Scanner!



WHAT ARE RTs?



NOT button pushers!

Select Techniques

Diagnostic Task



Techniques →





Image Quality

Radiation Dose





Questions?

