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Hamburg

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Angiographic Projections

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Angiographic projections

Aim

- optimal delineation of the structure of interest



Wilhelm Busch, 19th century



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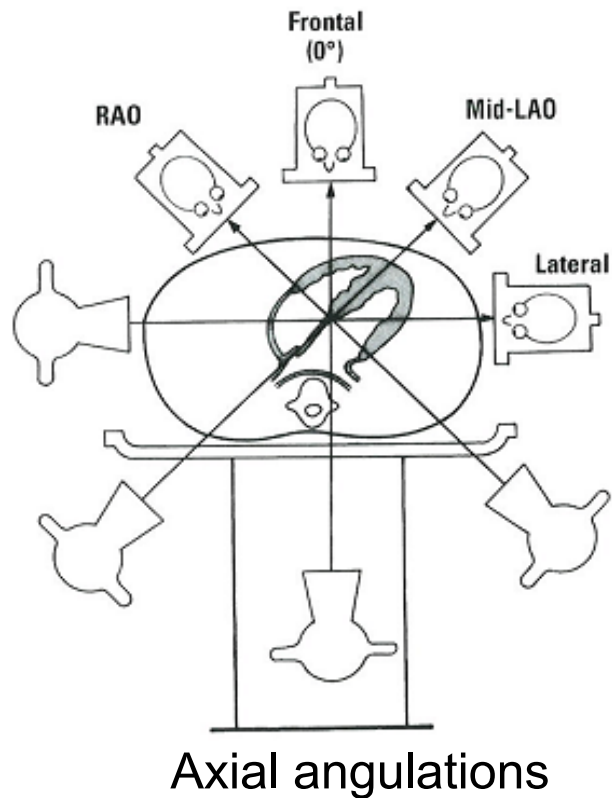
Aim of the presentation

- Terminology
 - Commonly used projections
 - Typical projections used in CHD
 - Projections and extent of radiation
-

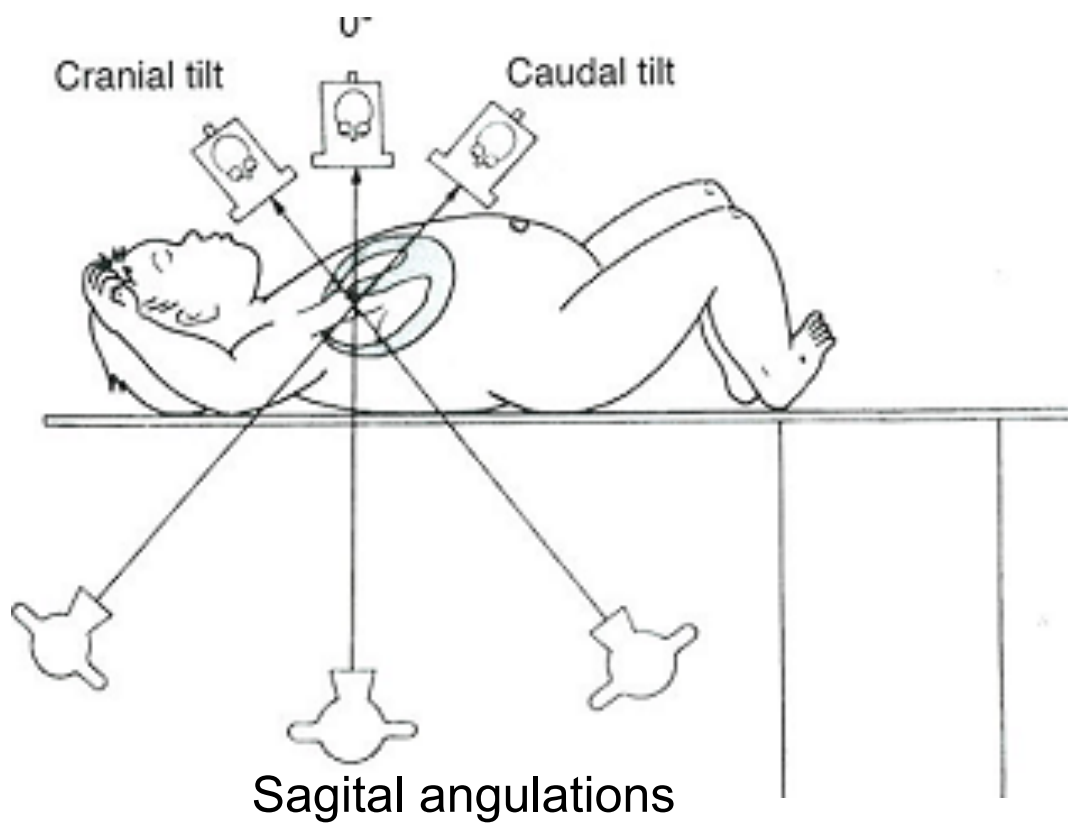
Angiographic projections

Terminology

- direction of the X ray beam toward the detector
e.g. PA– projection (frontal =0 degree)



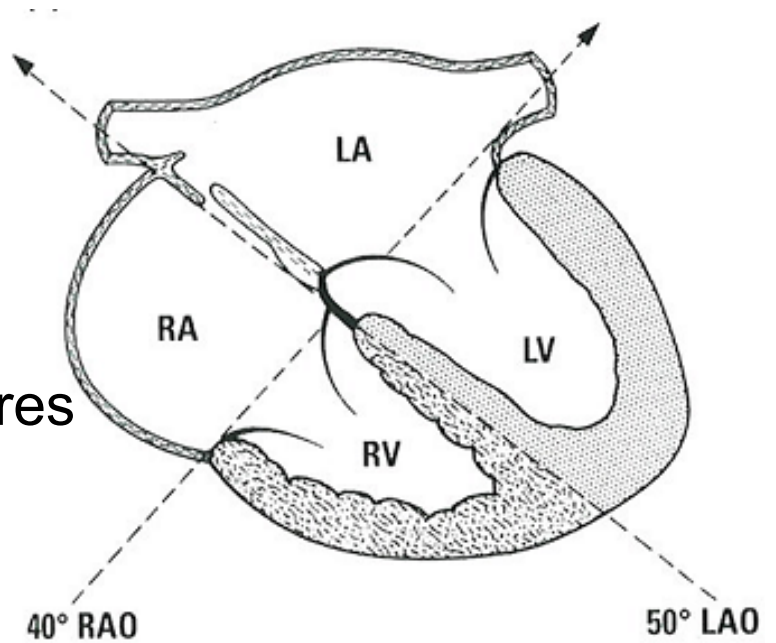
Angiographic projections



Angiographic projections

Selection of projections

Angulations
of the x- ray beam
according to the structures
to be delineated





A -plane

B-plane

Frontal "Camera"		Lateral "Camera"	
Frontal/posteroanterior (PA)	0°	Straight lateral	90°
Right anterior oblique (RAO)	Usually -20-30°	Left anterior oblique (LAO)	20-70°
"Sitting Up"	0° frontal +20-30° cranial	Long axial oblique (<i>not</i> LAO)	70° lateral +30° cranial
"Laid Back"	0° frontal +30° caudal	Hepatoclavicular (4-chamber)	45° lateral +45° cranial
		Aortic orifice view	100-120° lateral +20-30° caudal

- When will which angulations be used?



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Strait frontal/ PA view

Use

- Initial imaging
- Systemic veins
- Peripheral PAs
- Ao- PA -collaterals
- SV morphology

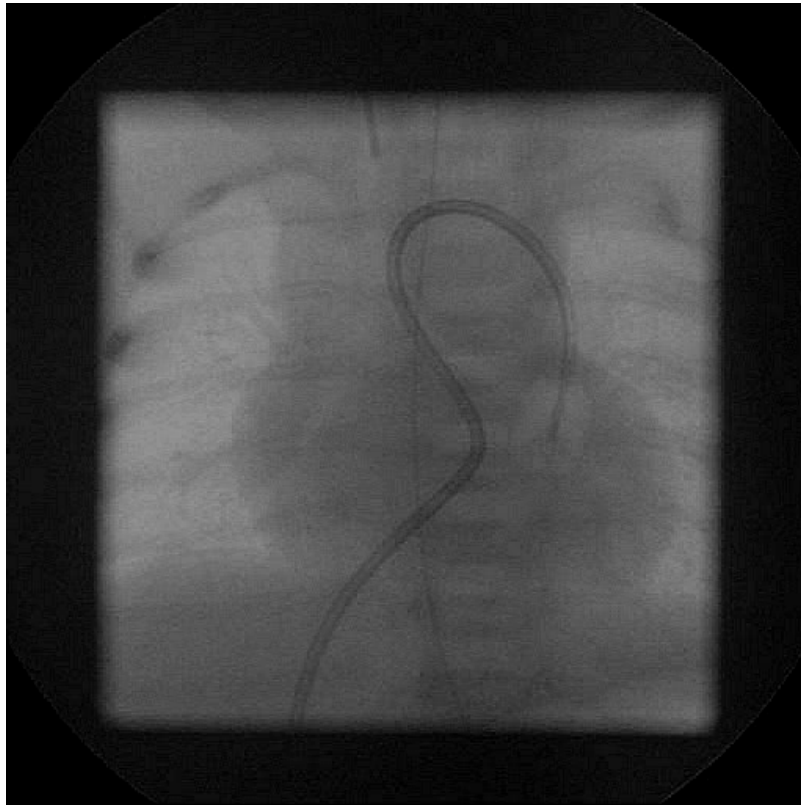




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Strait frontal/ PA view





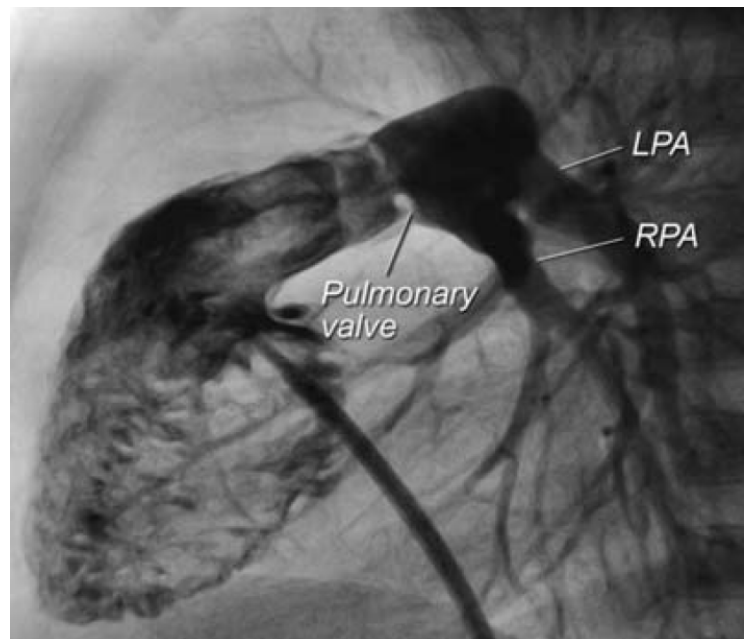
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Lateral/ 90 degree

Use

- Initial imaging
- RV outflow tract
- MPA with branches
- PDA
- CoA
- Coronary artery origin and course

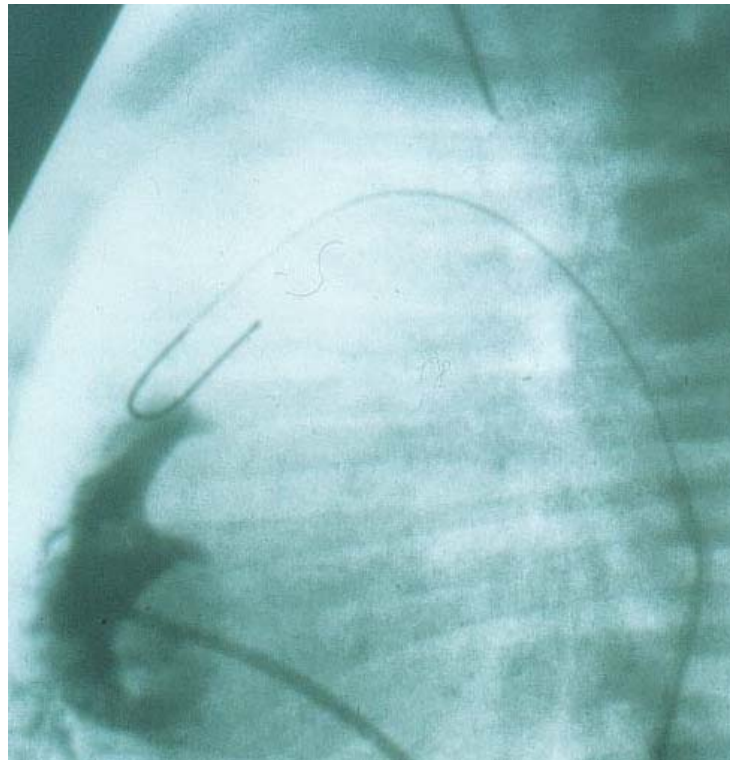




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Lateral projection for RVOT

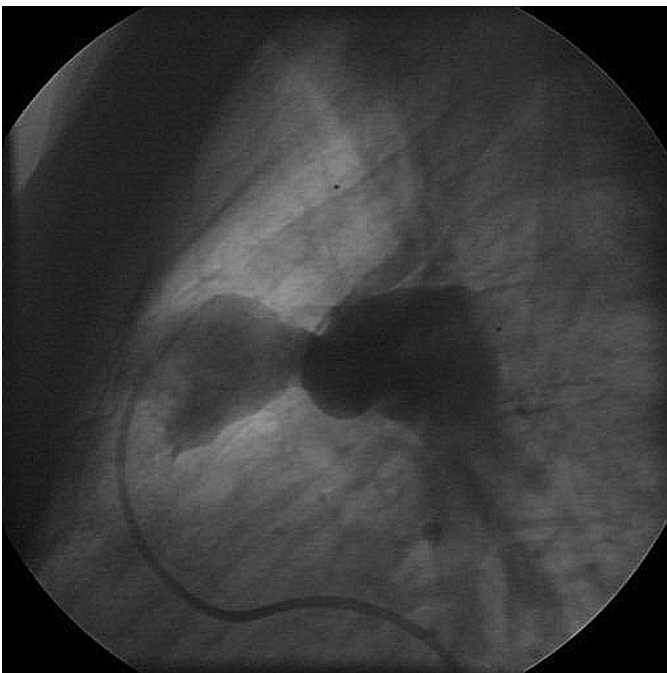


Pulmonary atresia with IVS

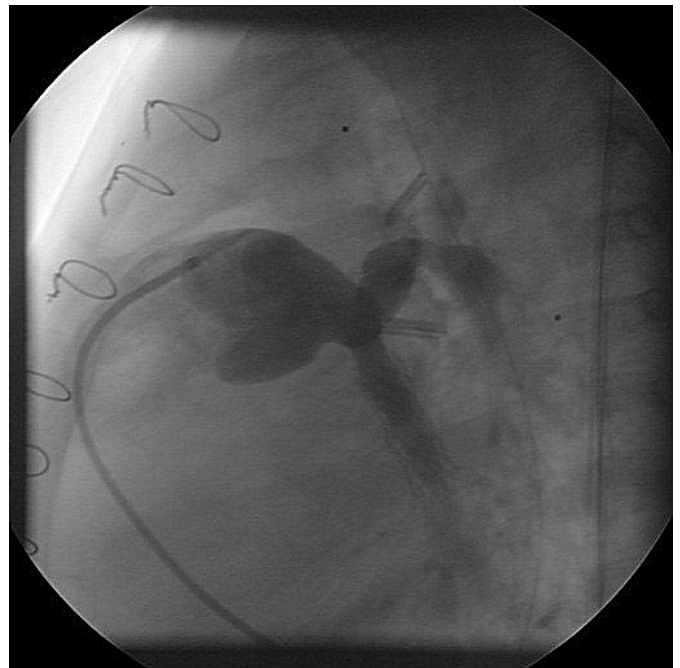
Lateral projection with caudal angulation

Use

- Origin of branch pulmonary arteries



straight

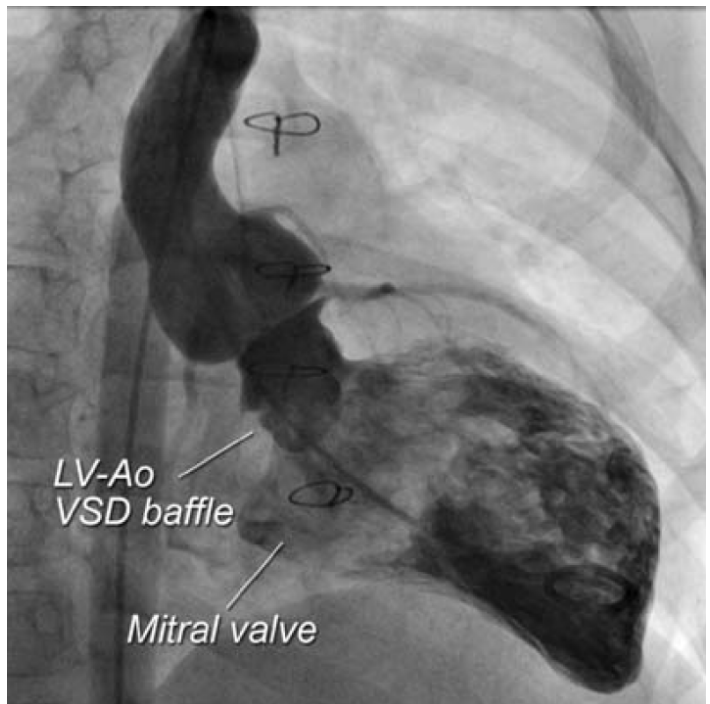


with caudal angulation 15°



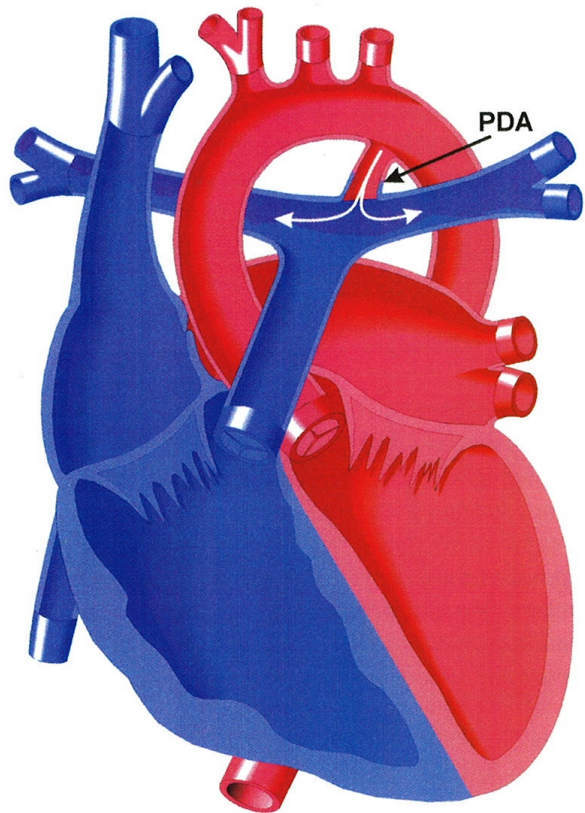
Use

- Left ventricle
 - outflow tract
 - goose neck formation
 - mitral valve
 - aortic valve
- Right pulmonary artery
- CoA
- **PDA**

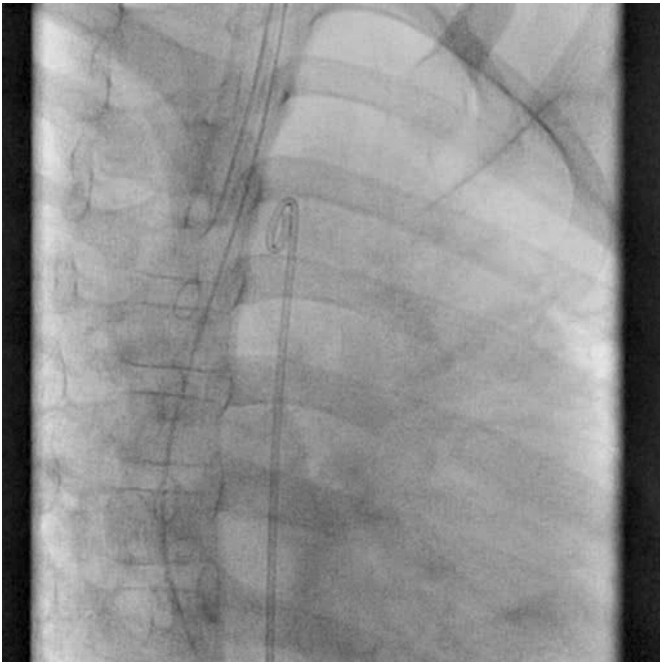


Patent Ductus Arteriosus

A: RAO 45°
B: lateral



PDA



RAO 40°



lateral



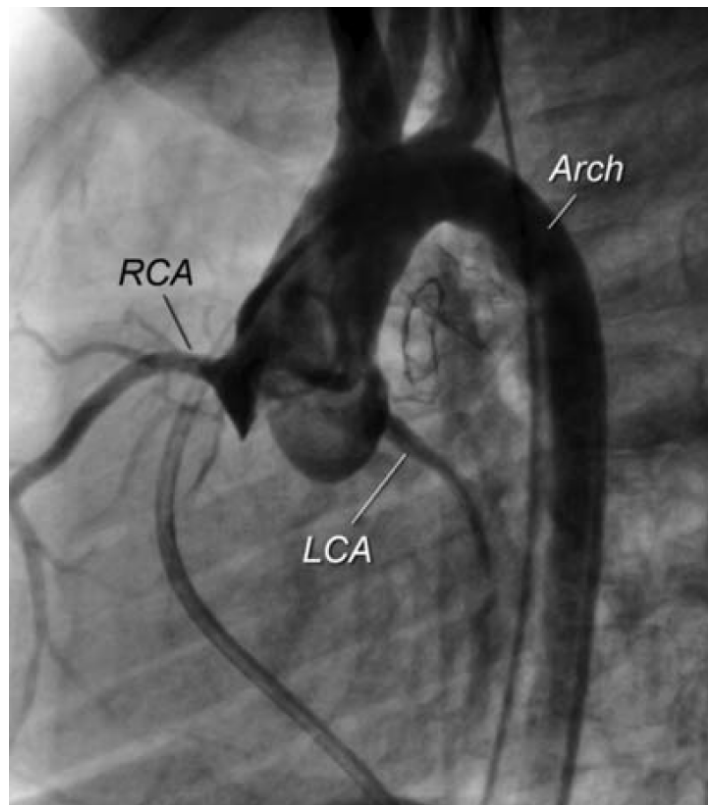
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Left Anterior Oblique (LAO)

Use

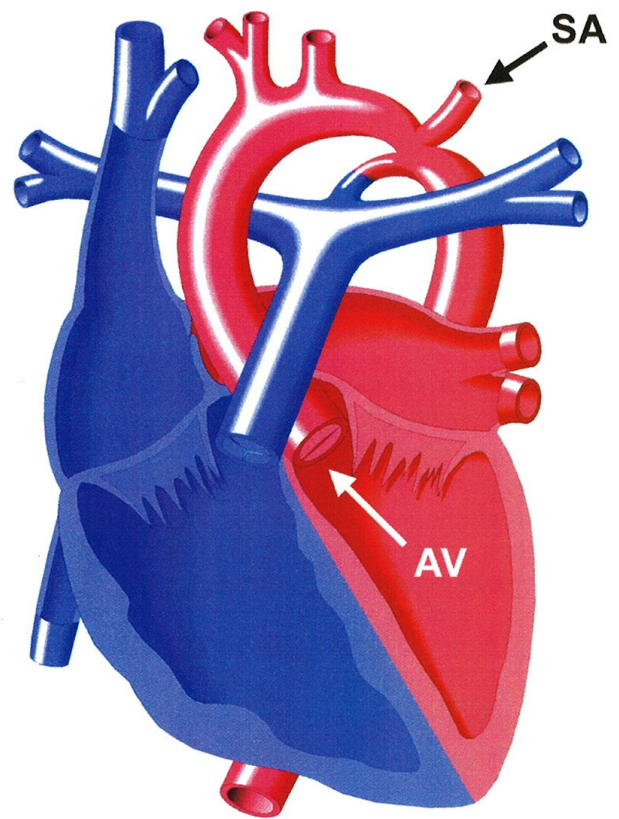
- LPA origin and course
- Aortic arch
- **CoA**



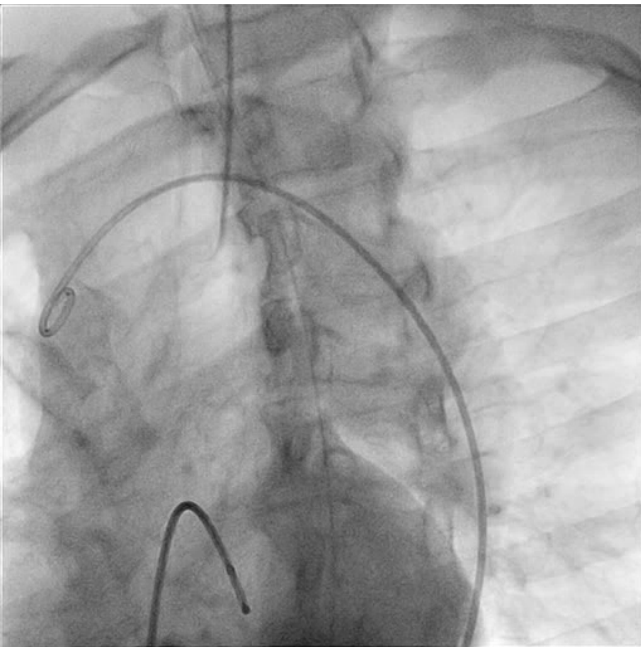
Coarctation of Aorta

A: LAO 45°

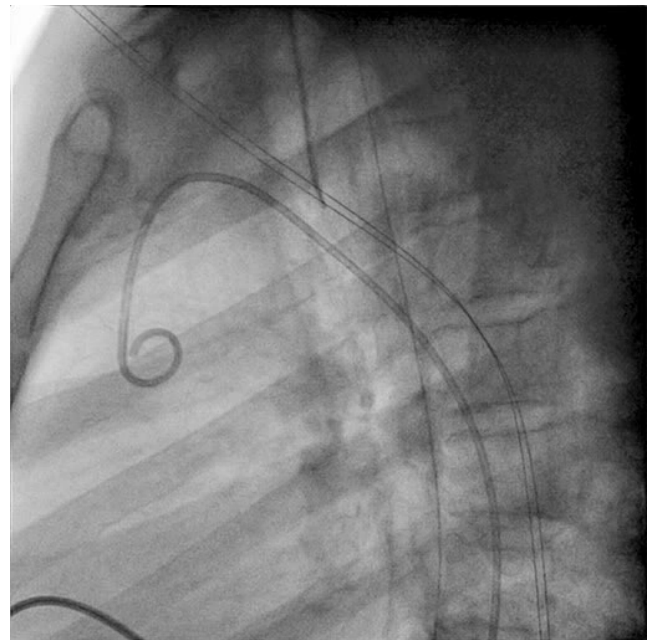
B: lateral



Coarctation of Aortae



LAO



left lateral



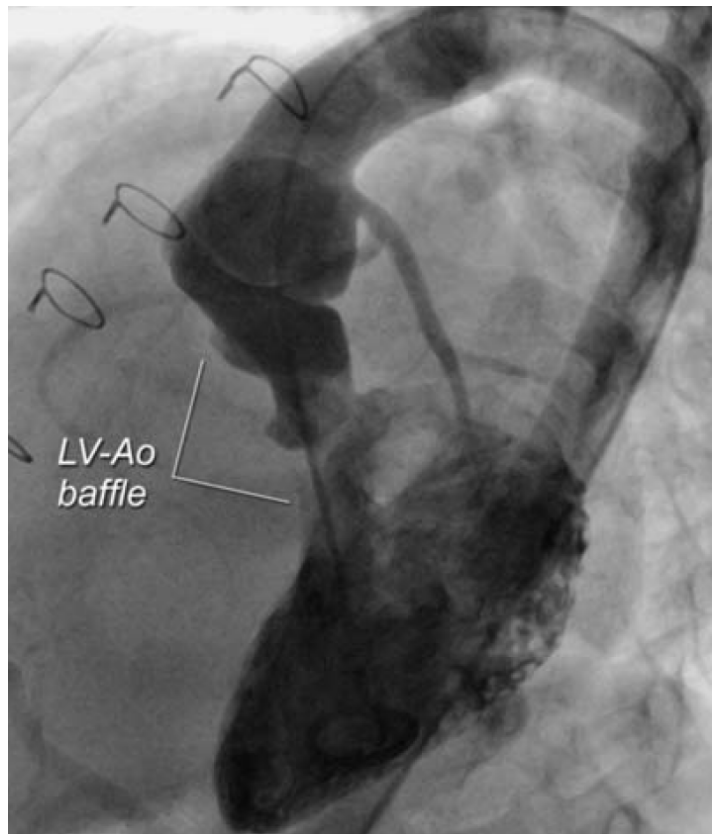
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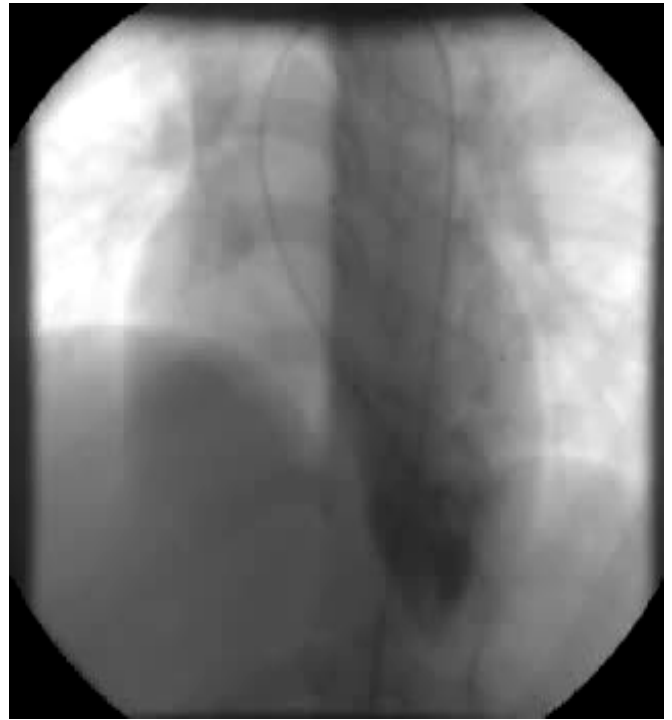
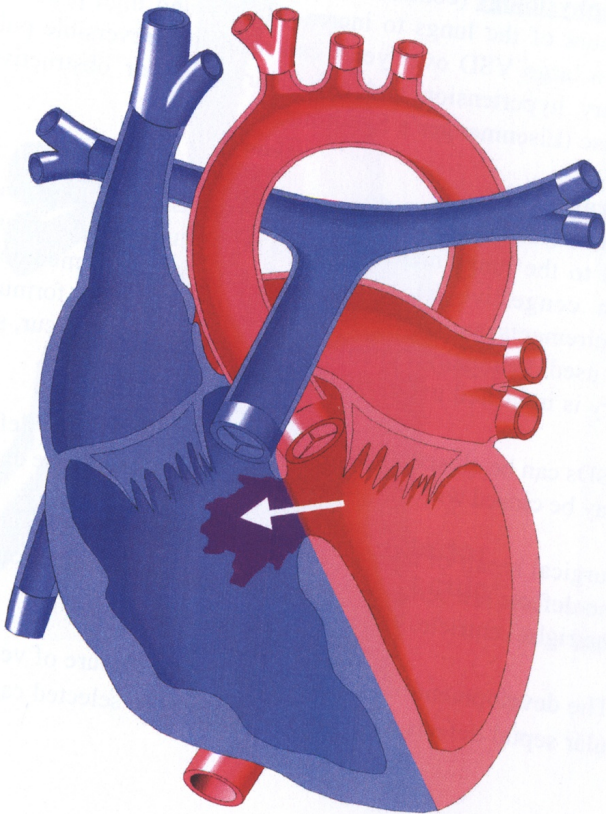
Long axis oblique (700 lateral with 300

Use

- Interventricular septum
- LVOT
- MV/MR
- Aortic valve
- Ascending aorta



Occlusion of perimembranous VSD



long axis oblique



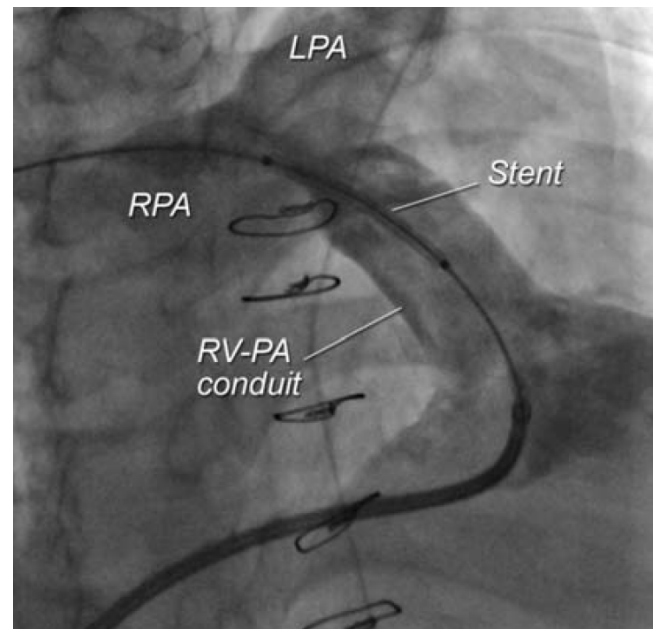
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„Sitting up projection“ PA projection with cranial 300

Use

- › Main PA
- › Bifurcation
- › RPA (with RAO)
- › LPA (with LAO)

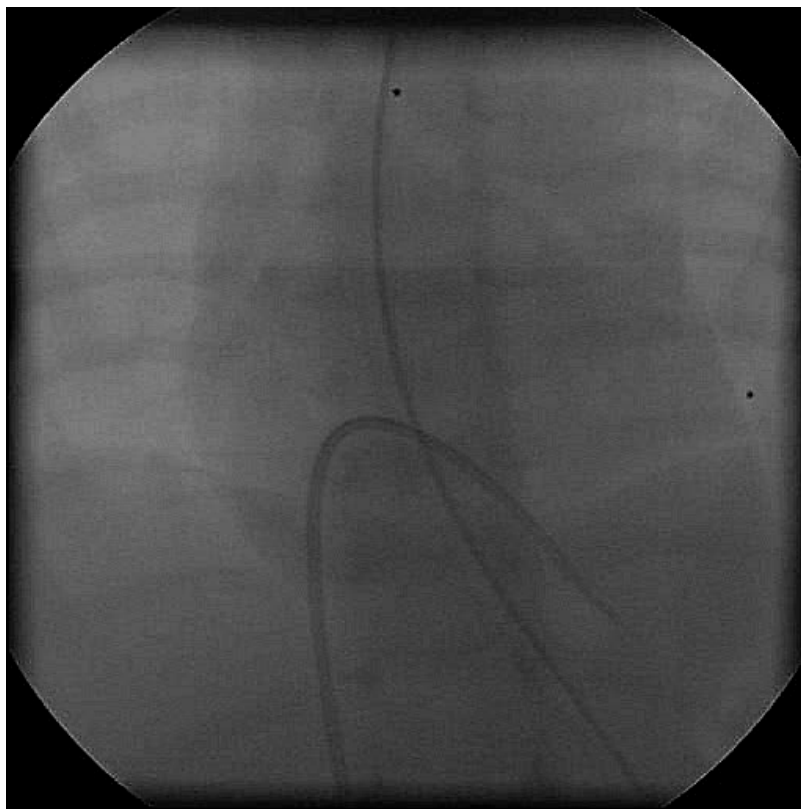




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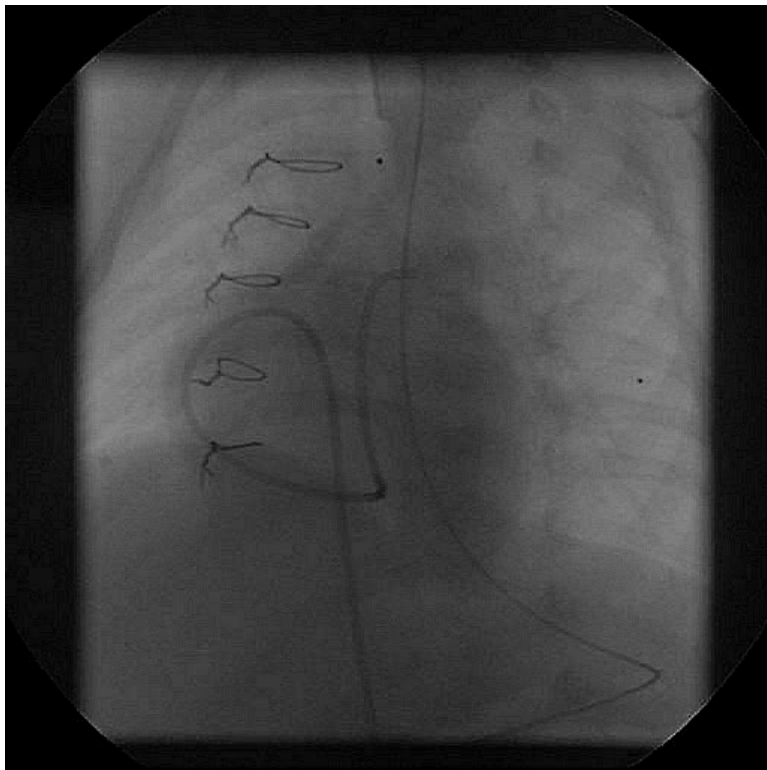
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„Sitting up projection“ PA projection with cranial 300



Valvar pulmonary stenosis

LPA- stenosis



LAO with cranial 30°



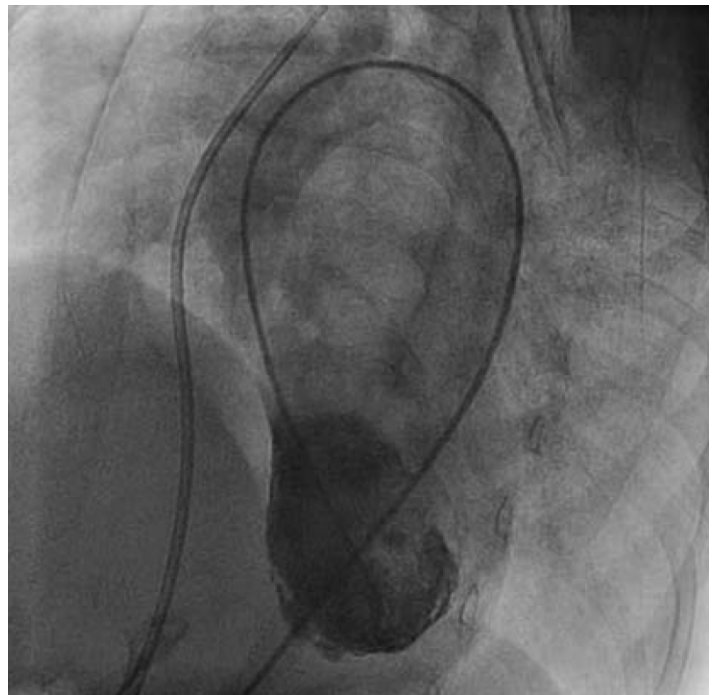
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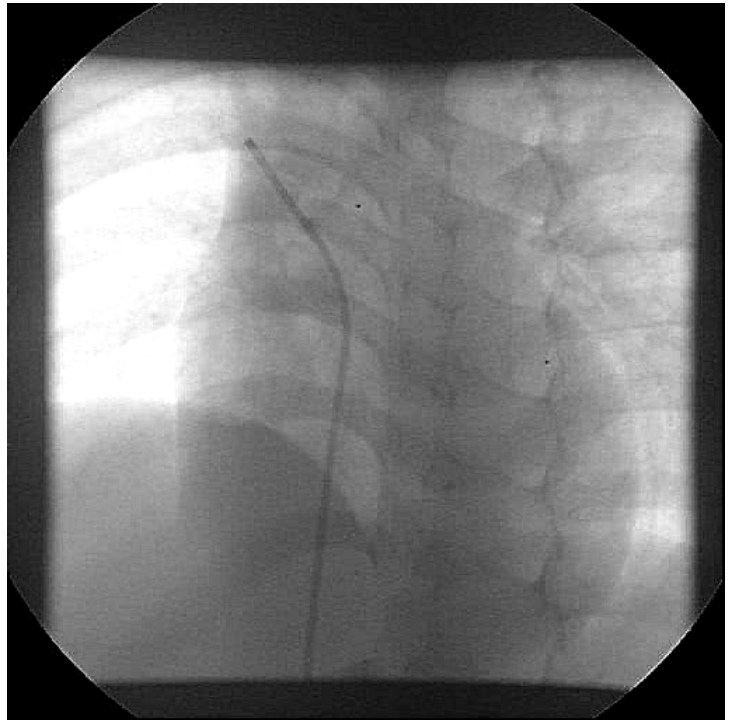
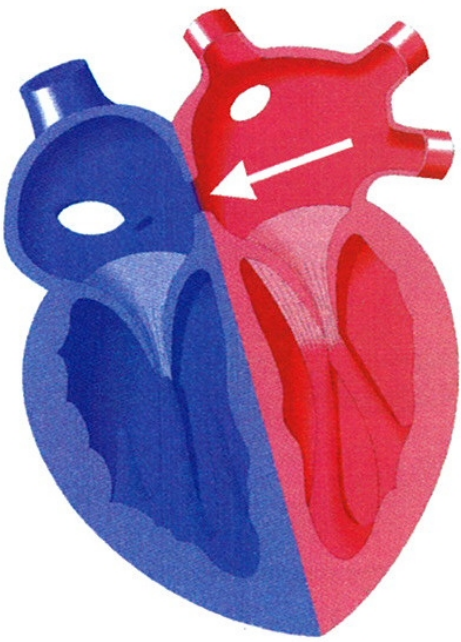
„Four chamber view“ 45° LAO and 45° cranial

Use

- Interatrial septum
- Pulmonary veins
- AV valves
- Interventricular septum



**“Four chamber view”
Profiling the intra- atrial septum**





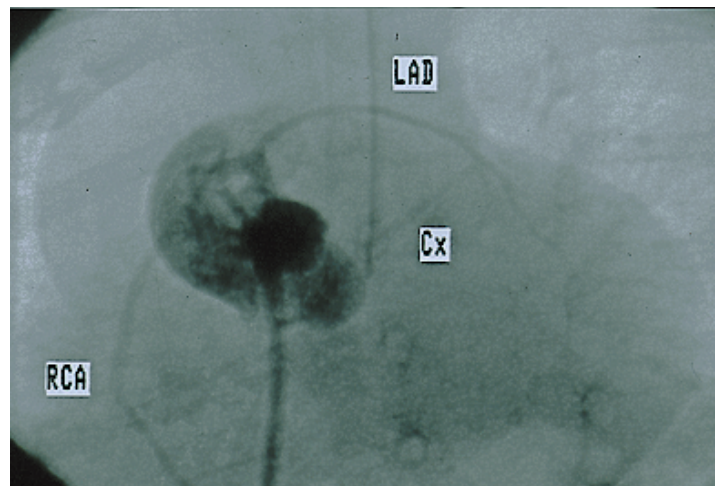
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“Laid back projection”
LAO 30° and caudal 45°

Use

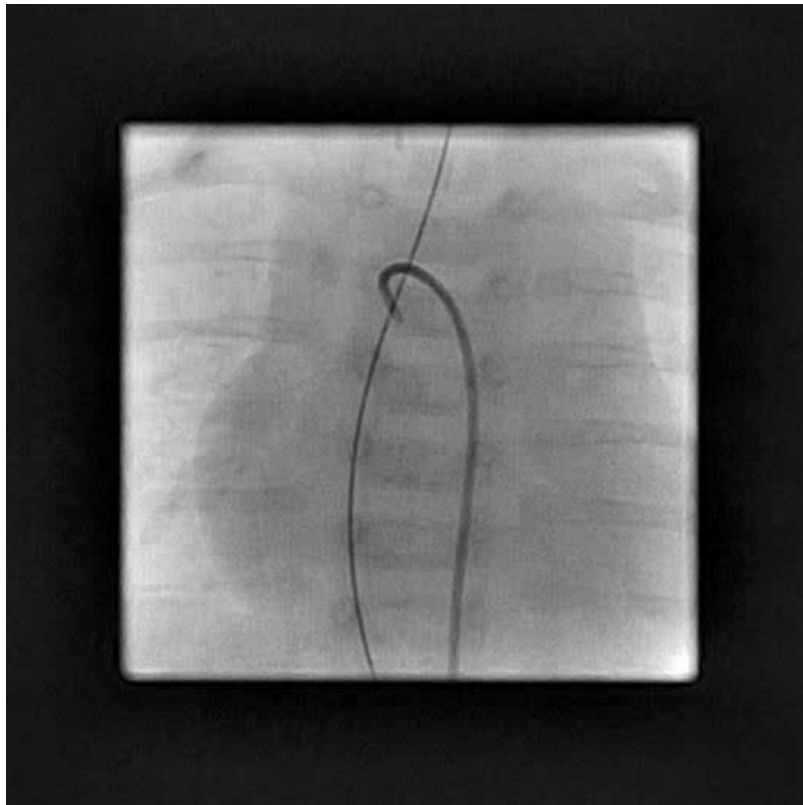
- Coronary arteries
 - TOF
 - TGA
- Pulmonary arteries





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Tetralogy of Fallot LAD from right coronary artery

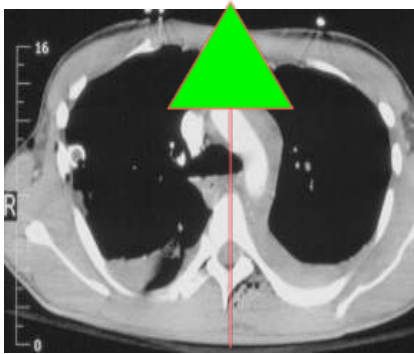




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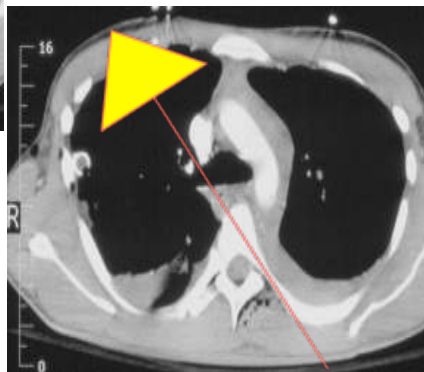
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Less irradiating angulations

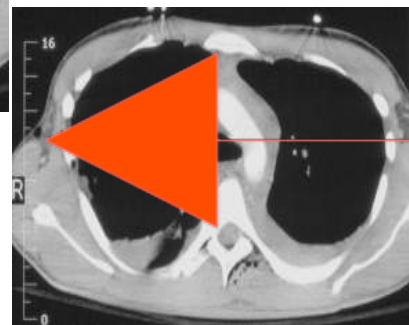


p.a

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oblique



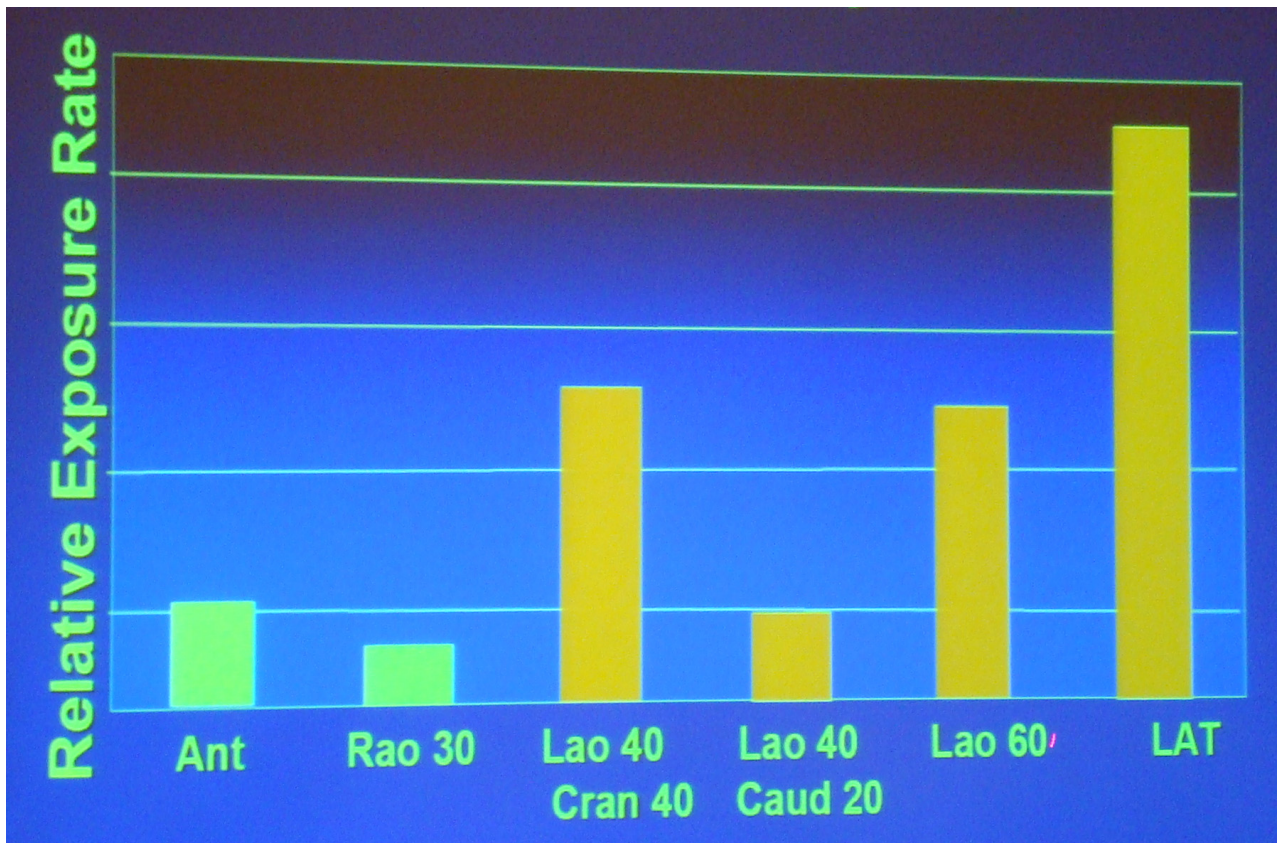
lateral

The more tissue traversed,
the more dose to the patient
and the operator!



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Less irradiating angulations





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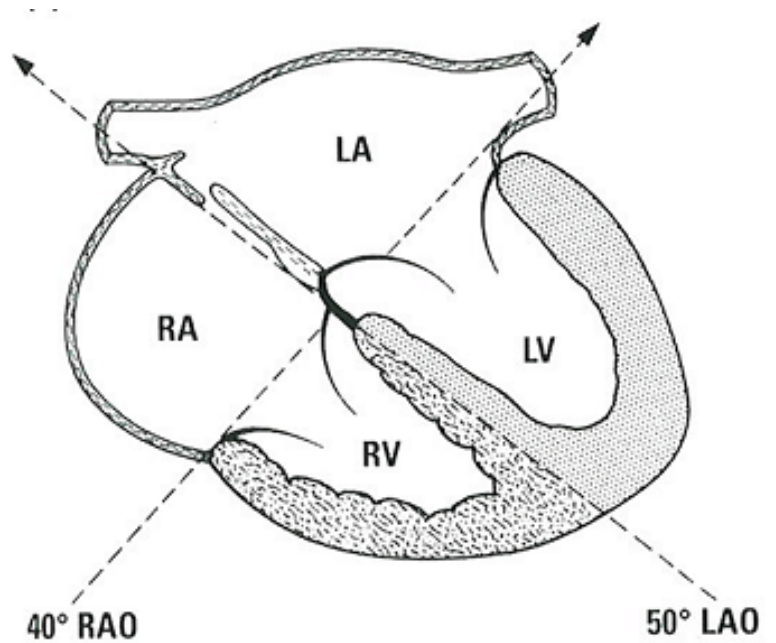
Angiographic projections

Aim

- optimal delineation of the structure of interest

Realisation

- Angulations of the x-ray beam



Angiographic projections

Aim

- optimal delineation of the structure of interest

Requirement

- Changes of the angle of looking at these structures

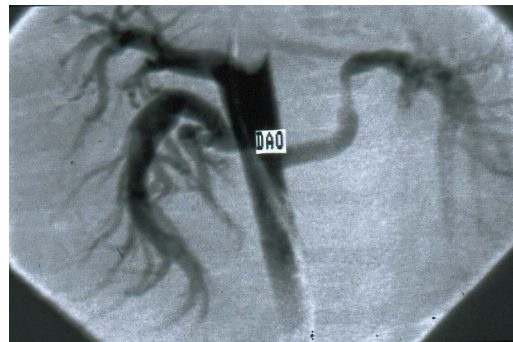


Wilhelm Busch, 19th century



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