



# Praktische aspecten hartcatheterisatie - bij aangeboren hartafwijkingen -

Lennie van Osch-Gevers

Frederik du Plessis

Afdeling kindercardiologie

ErasmusMC Sophia Rotterdam

# Hartcatheterisatie bij kinderen

- Aangeboren afwijkingen
- Indicatie hartcatheterisatie
  - diagnostisch
  - therapeutisch
- Hemodynamiek
- Procedure
- Complicaties
- Illustraties

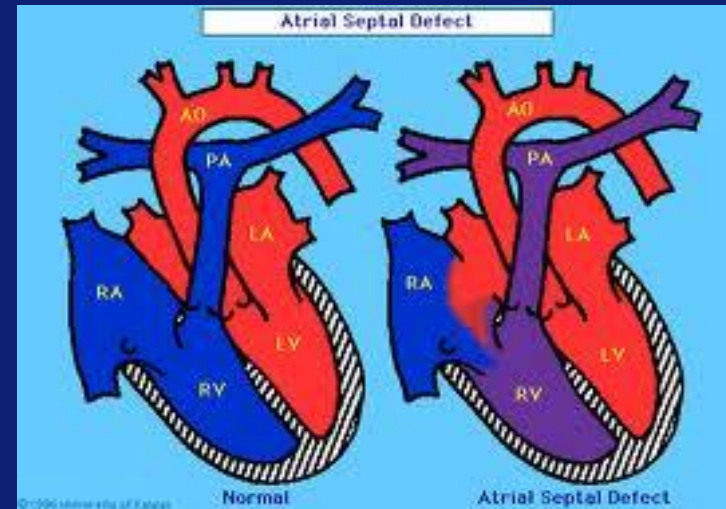
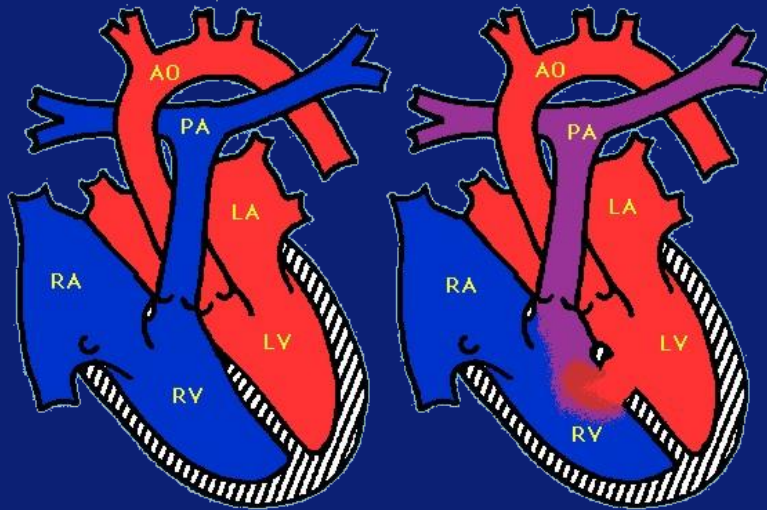
# Epidemiologie

- Incidentie **0.8%** van pasgeborenen
  - 1200-1500 kinderen/jaar
  - 50% behoeft 1 of meerdere ingrepen
  - mortaliteit kinderleeftijd (< 20 jaar) circa 5%
- Vanaf eind jaren 60 dankzij hart-longmachine cardiochirurgie
- **Groei aantal volwassenen** met aangeboren hartafwijking
  - momenteel circa **25 000** patiënten
  - groei 5% per jaar

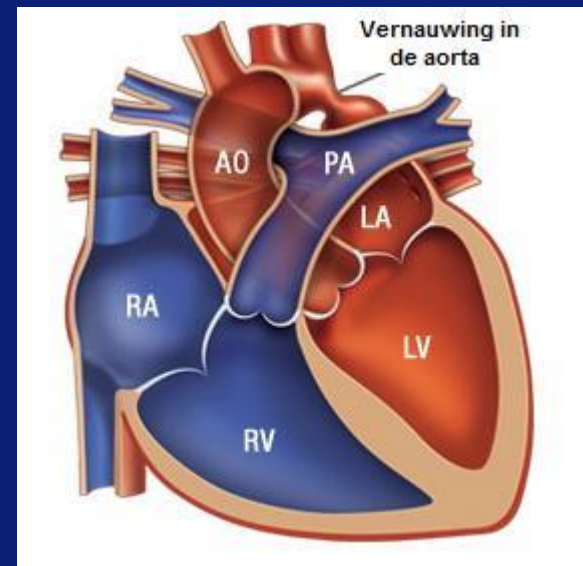
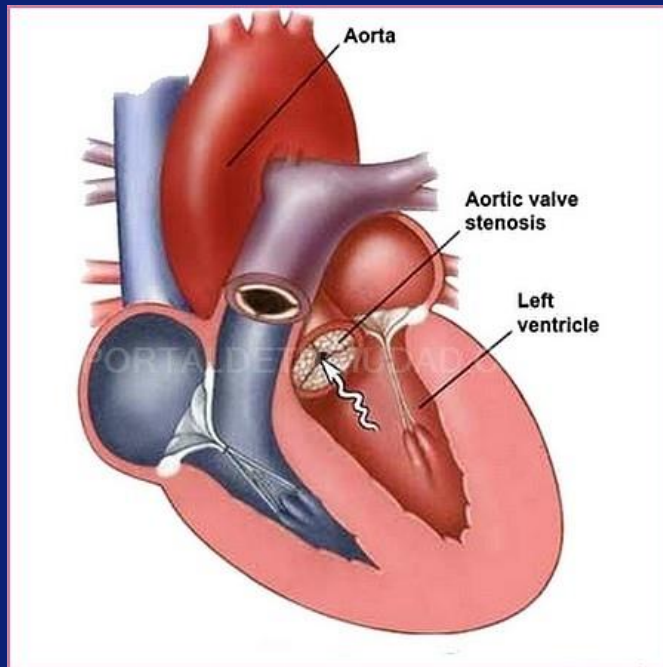
# Incidentie specifieke afwijkingen

▪ Shunts:	VSD	
	ASD	60%
	ODB	
	AVSD	
▪ Obstructies:	AoS	
	PS	20 %
	Coarct	
▪ Complex:	TGA	5 %
	cyanotisch overig	15 %

# Afwijkingen met shunts

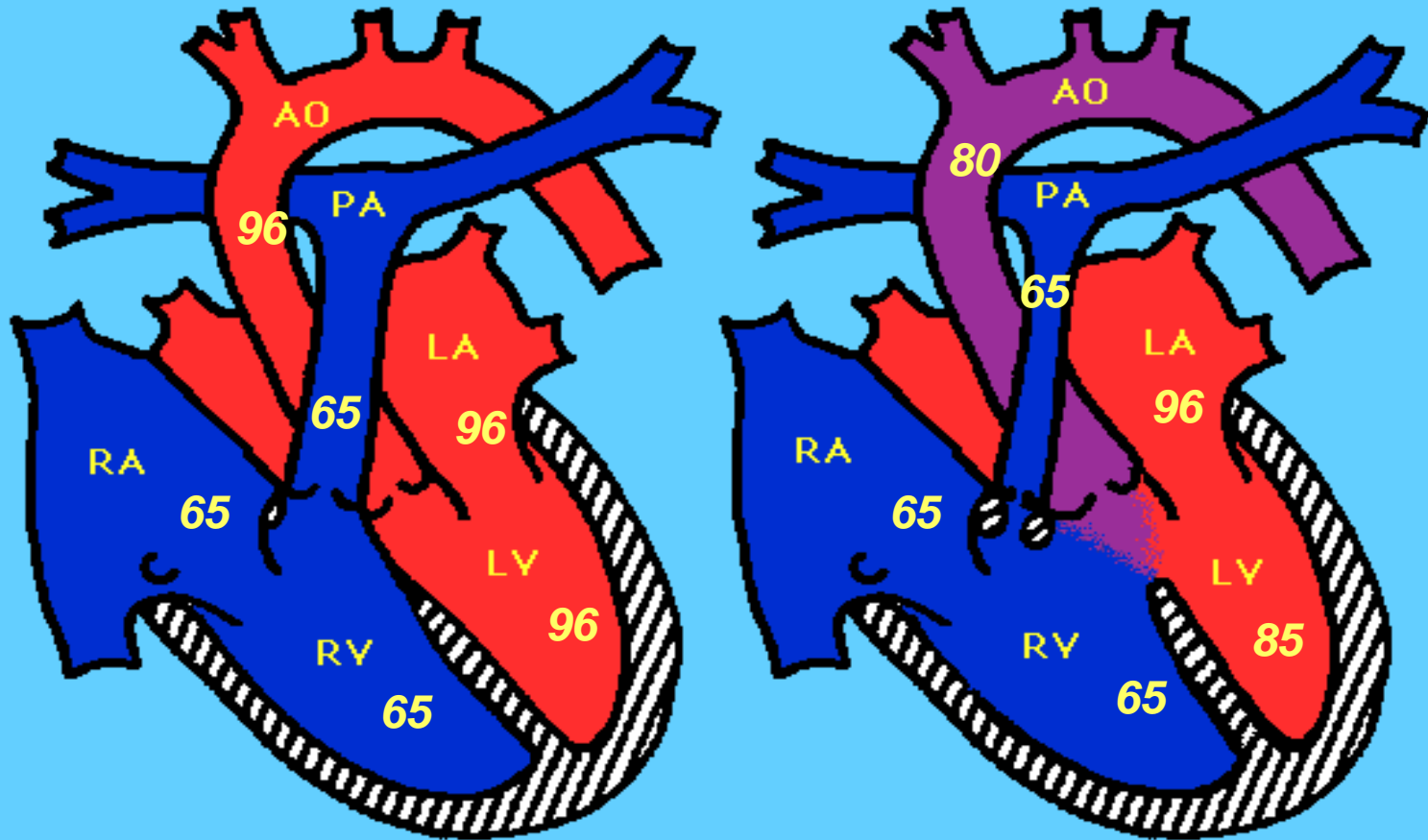


# Afwijkingen met obstructie



# Afwijkingen cyanose

## Tetralogy of Fallot

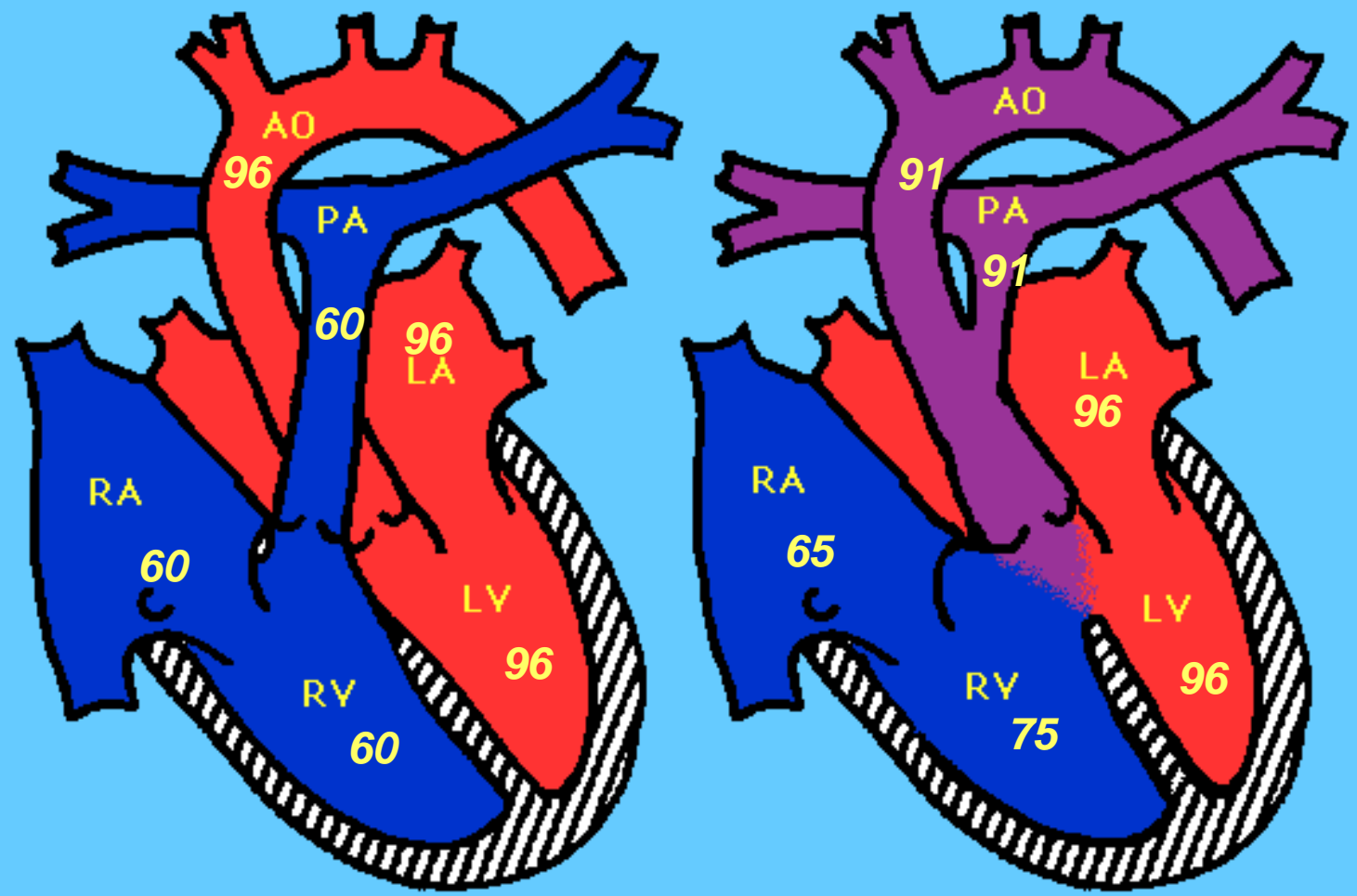


Normal

Tetralogy of Fallot

# Afwijkingen cyanose

Truncus Arteriosus



Normal

Truncus Arteriosus



# Indicatie hartcatheterisatie - diagnostisch -

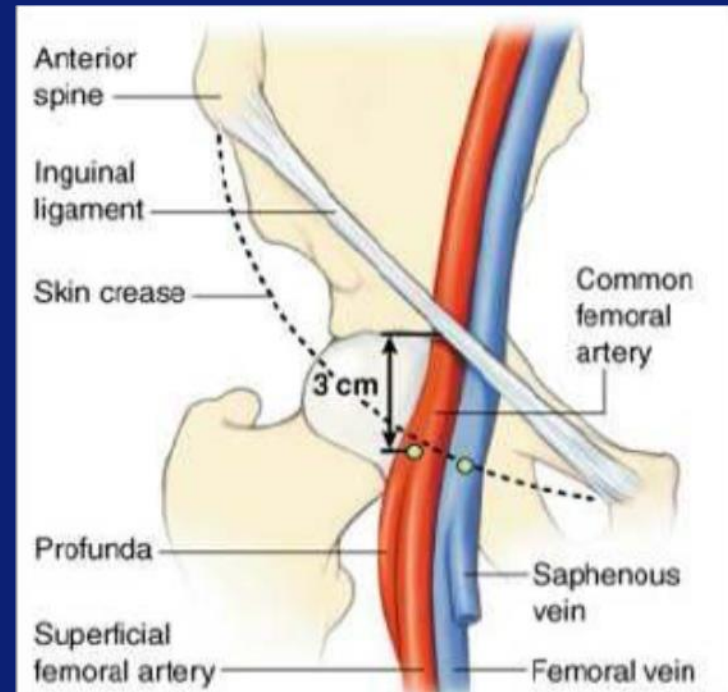
- Anatomische afbeeldingen
- Drukmetingen
  - Drukverval tussen 2 meetpunten
- Shuntgrootte
- Weerstandsmetingen
- Flow metingen
- Electrophysiologische onderzoeken

# Indicatie hartcatheterisatie - interventies -

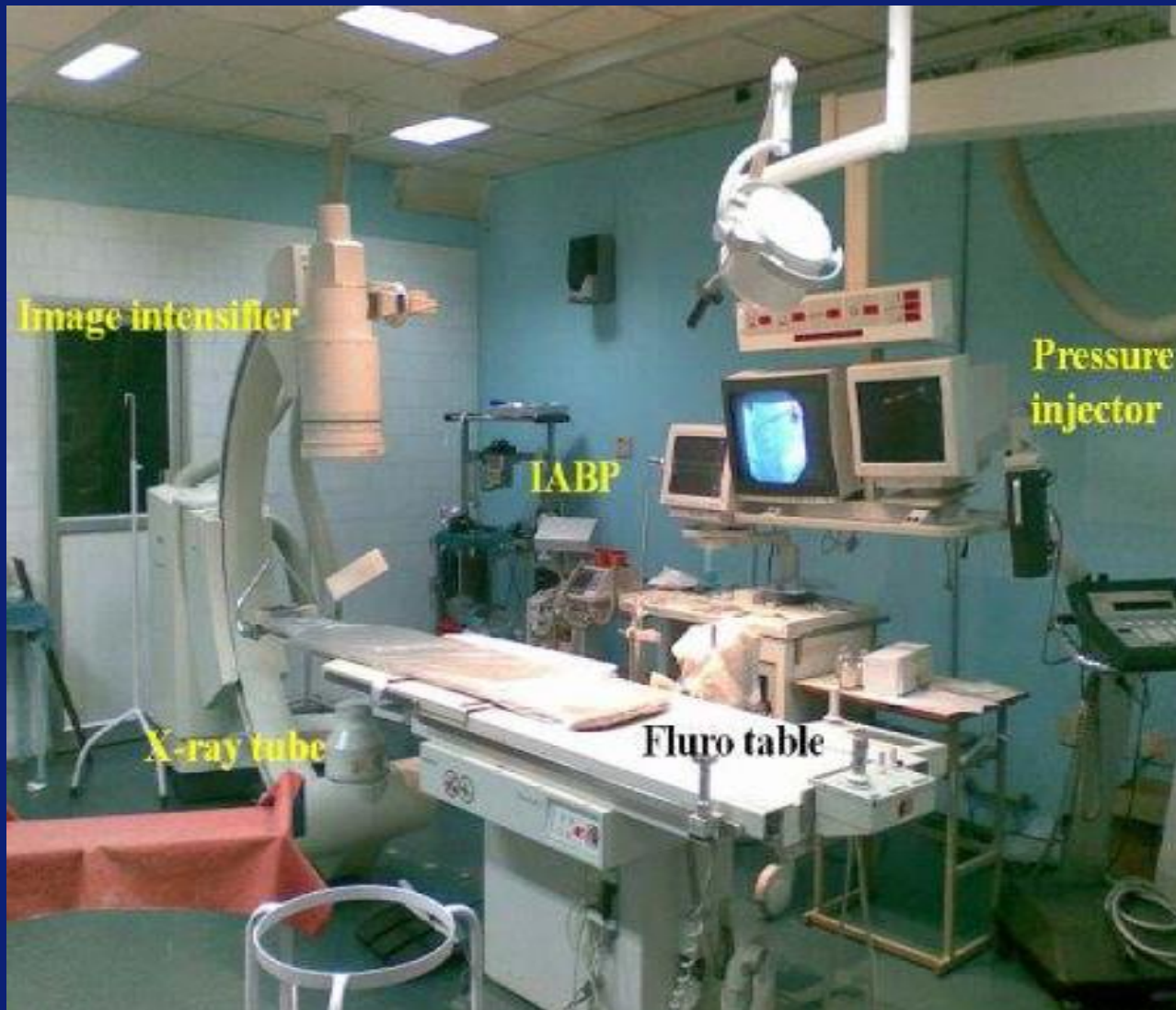
- Sluiting van shunts, bijv. ODB, ASD, VSD, collateralen en fistels
- Stentplaatsing bijv. coarctatie, longarteriën
- Ballon angioplastiek: Pulmonaal-, aorta-, mitraliskleppen.
- Biopten
- Septostomie van atriumseptum
- Ablaties

# Toegang

- Inguinaal
- Umbilicaal
- Transhepatisch
- Transthoracaal



# Hartcath kamer historie



## Hart cath kamer modern



## Complicaties hartcatheterisatie

- Narcose complicaties
- Pijn
- Vaatspasmen/vaatbeschadiging
- Bloeding/Hematoomformatie
- Infectie
- Pericard effusie



## Complicaties hartcatheterisatie

- Hypotensie
- Aritmie
- Congestief falen
- Myocardinfarct
- Beroerte
- Allergische reactie
- Nierfunctiestoornis

## Contraindicaties

- Onervarenheid
- Ernstige ongecontroleerde hypertensie
- Ventriculaire aritmieën
- Acute beroerte
- Ernstige anemie
- Allergie voor radiografische contrast
- Acuut nierfalen
- Niet-gecompenseerde congestieve falen (patiënt kan niet plat liggen)
- Onverklaarbare koorts en / of onbehandelde actieve infectie
- Electrolyet afwijkingen (bijv. hypokaliëmie)
- Ernstige coagulopathie



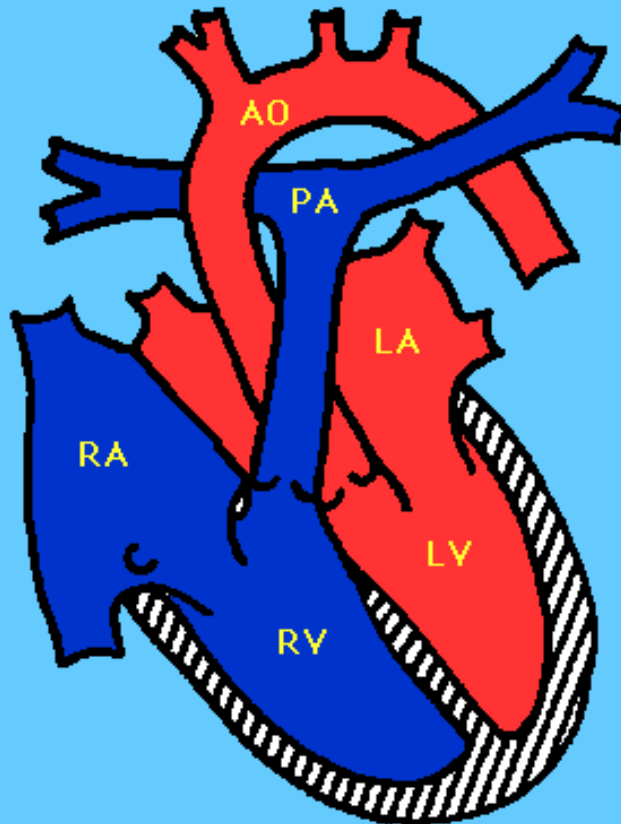


# Hartcatheterisatie

## Normale bevindingen

# Drukverhoudingen in hart

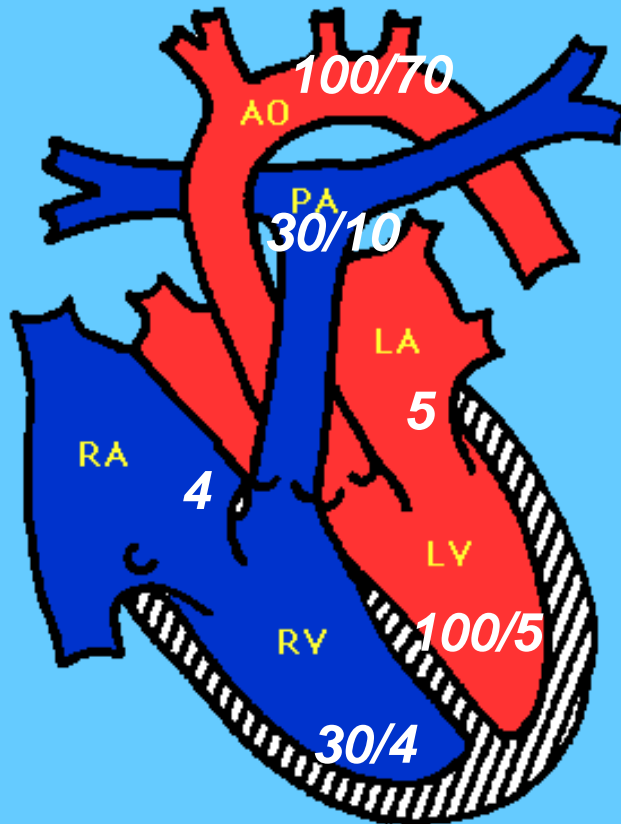
Normal Heart Diagram



Normal

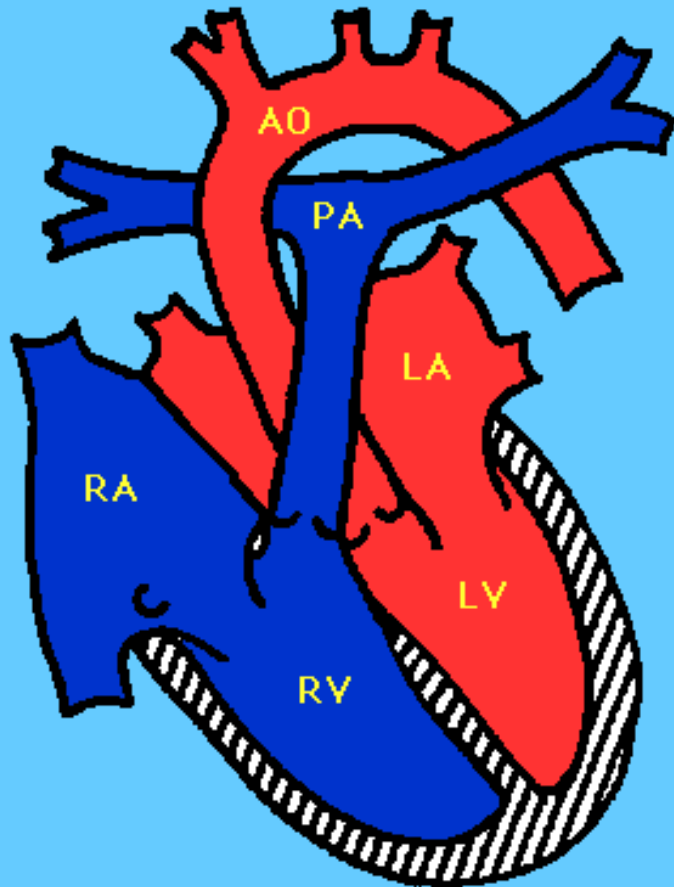
# Drukverhoudingen in hart

Normal Heart Diagram



# $O_2$ gehaltes in hart

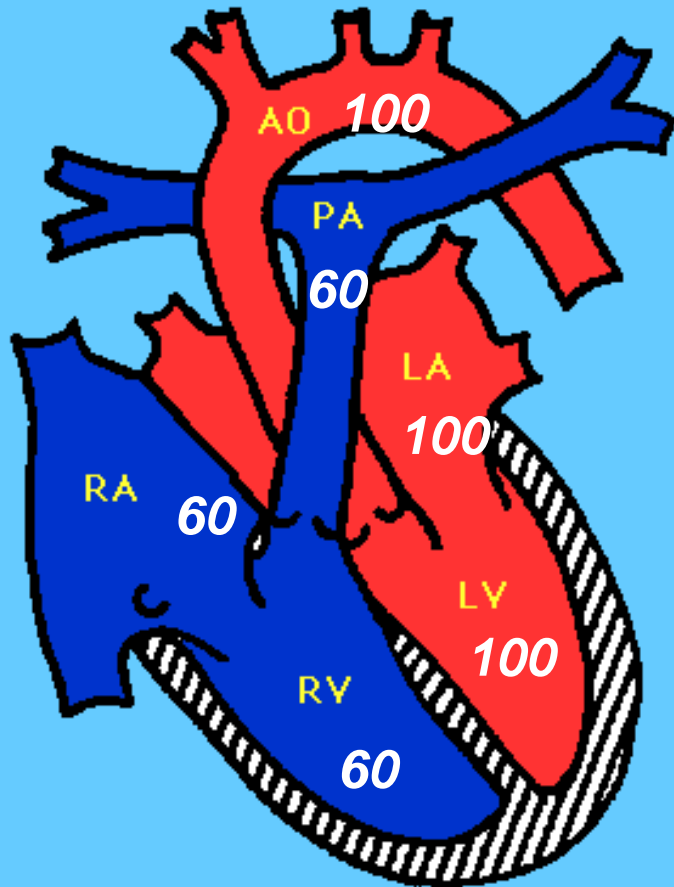
Normal Heart Diagram



Normal

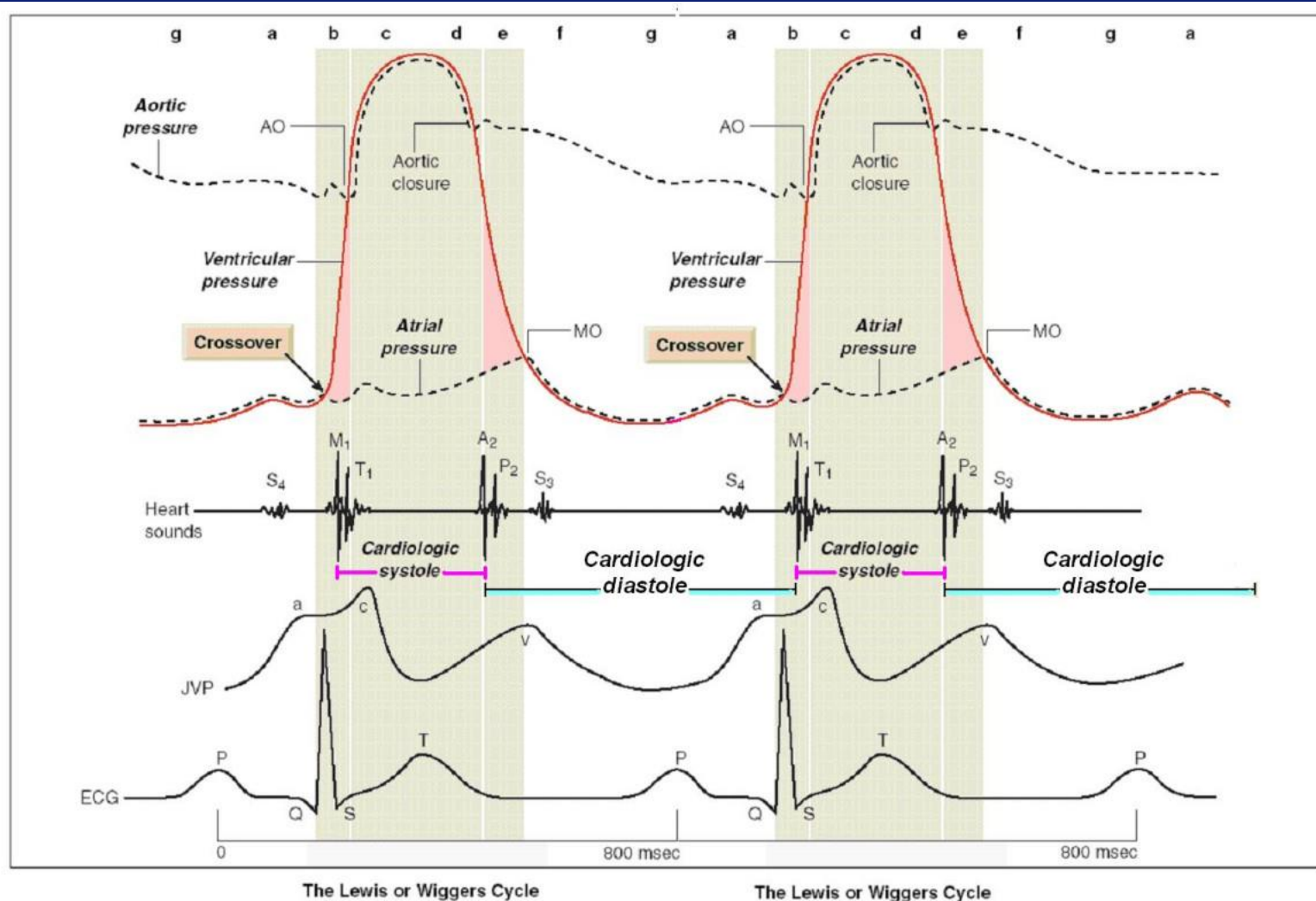
# $O_2$ gehaltes in hart

Normal Heart Diagram



Normal

# Hartcyclus



# Hemodynamiekmetingen

1. Shunts  
communicatie tussen li en re hartshelft
2. Hartminuutvolume en doorbloeding van de longen
3. Pulmonale vaatweerstand
4. Drukgradiënten

## Berekening Flow (vereenvoudigd)

$$Q_p = O_2 \text{ consumptie} / (O_2 \text{ sat LA} - O_2 \text{ sat AP})$$

$$Q_s = O_2 \text{ consumptie} / (O_2 \text{ sat Ao} - O_2 \text{ sat RA})$$

$$Q_p : Q_s = (O_2 \text{ sat Ao} - O_2 \text{ sat RA}) / (O_2 \text{ sat LA} - O_2 \text{ sat AP})$$

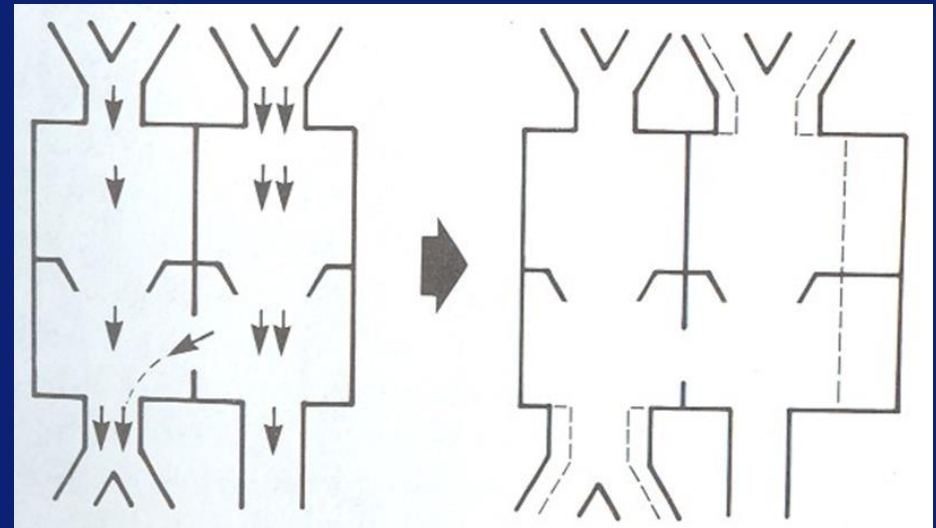
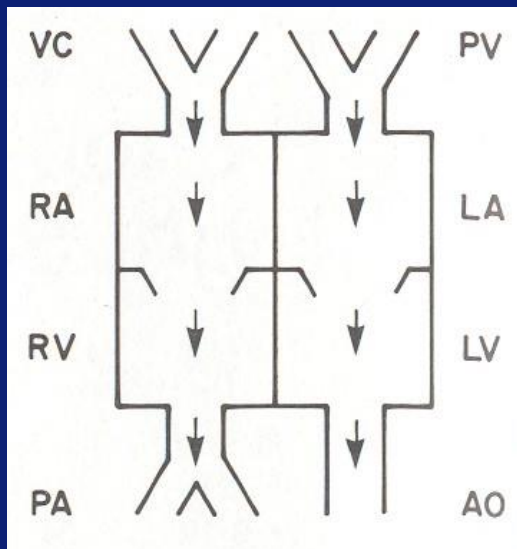




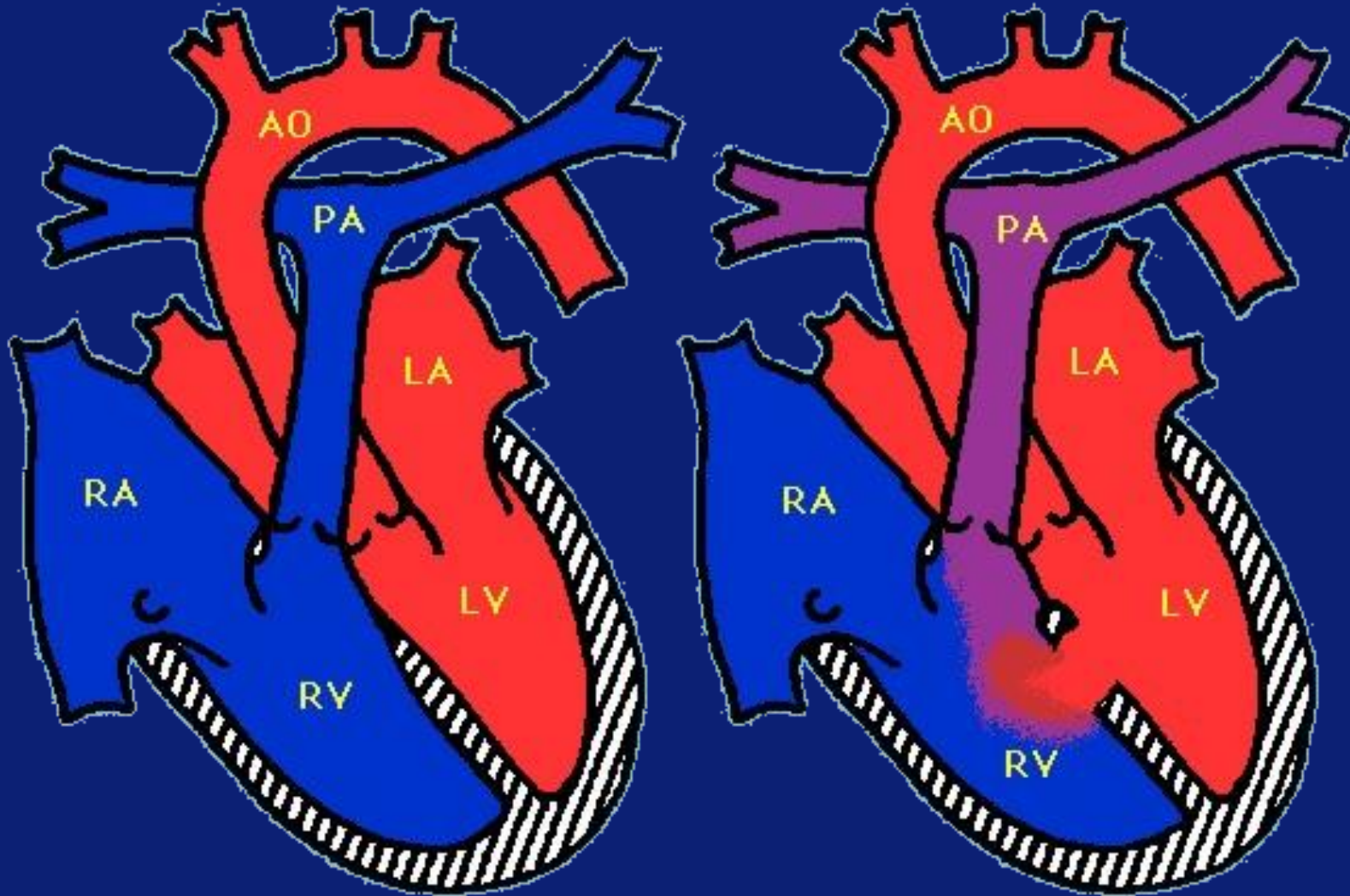
# Hartcatheterisatie

Pathologie diagnostisch

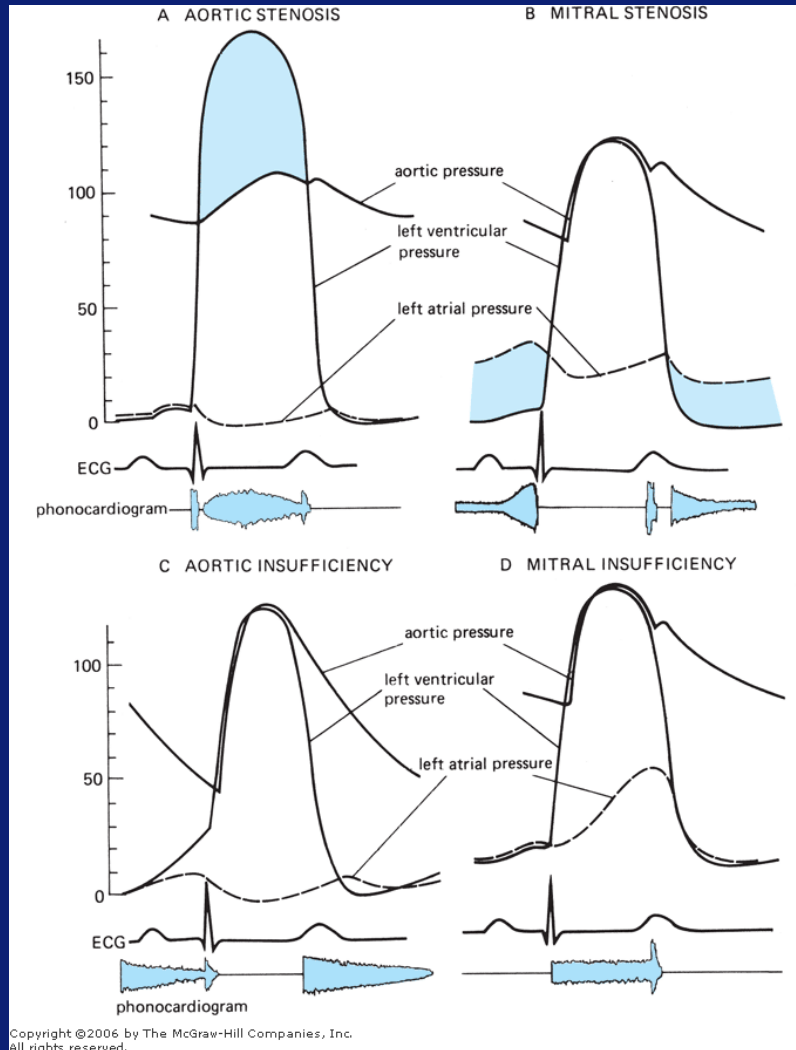
## Pathofysiologie normaal hart vs shunt



# Pathofysiologie VSD



# Drukmetingen



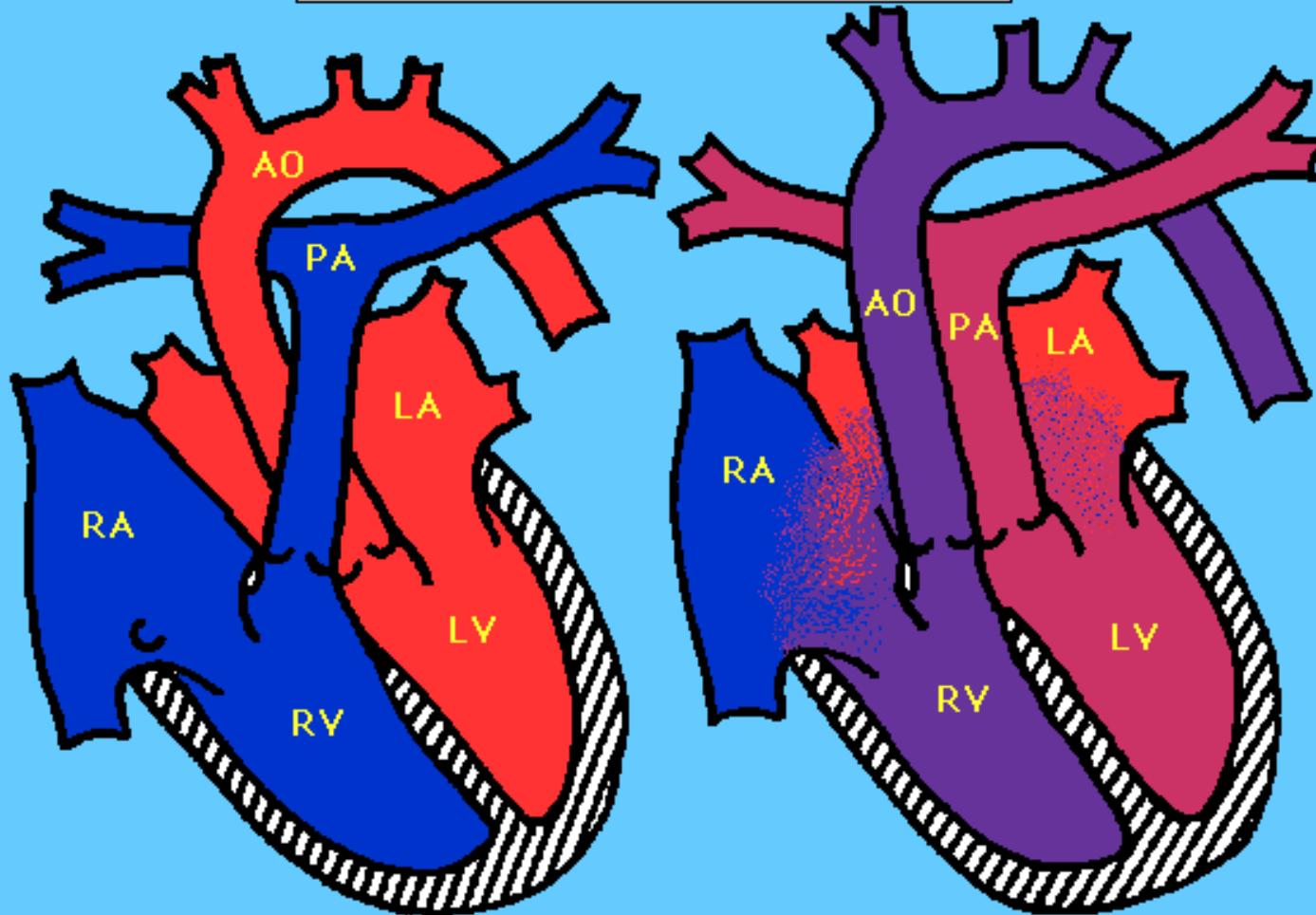
Copyright ©2006 by The McGraw-Hill Companies, Inc.  
All rights reserved.



# Hartcatheterisatie

Pathologie interventies

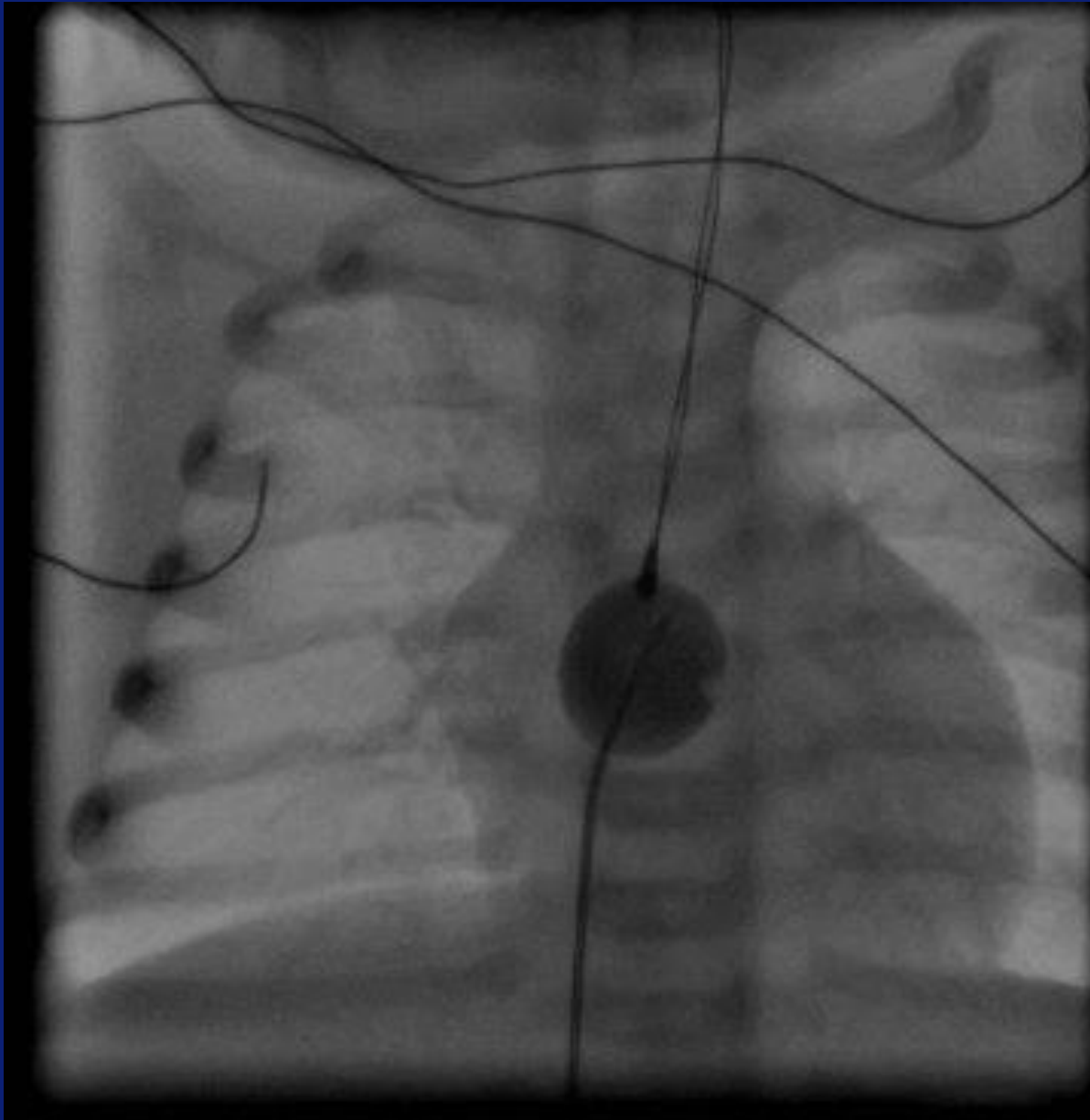
Transposition of the Great Vessels



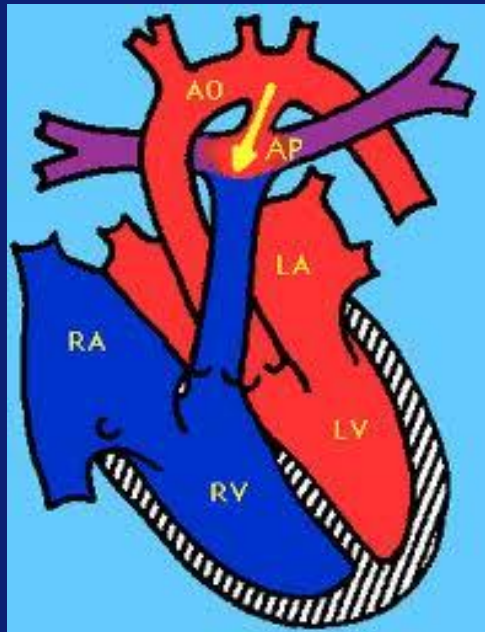
Normal

Transposition of the Great Vessels

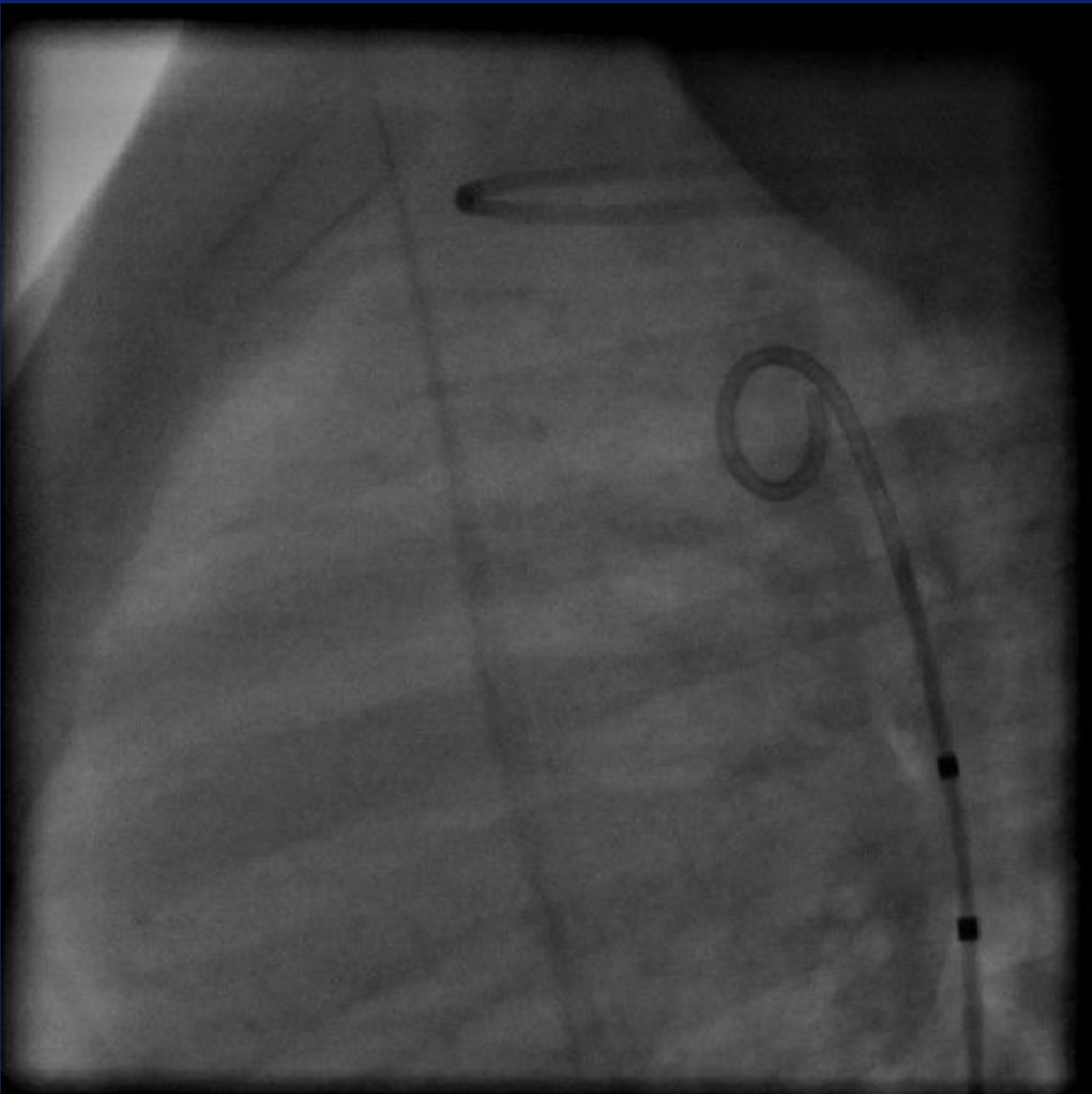
# Atrioseptostomie

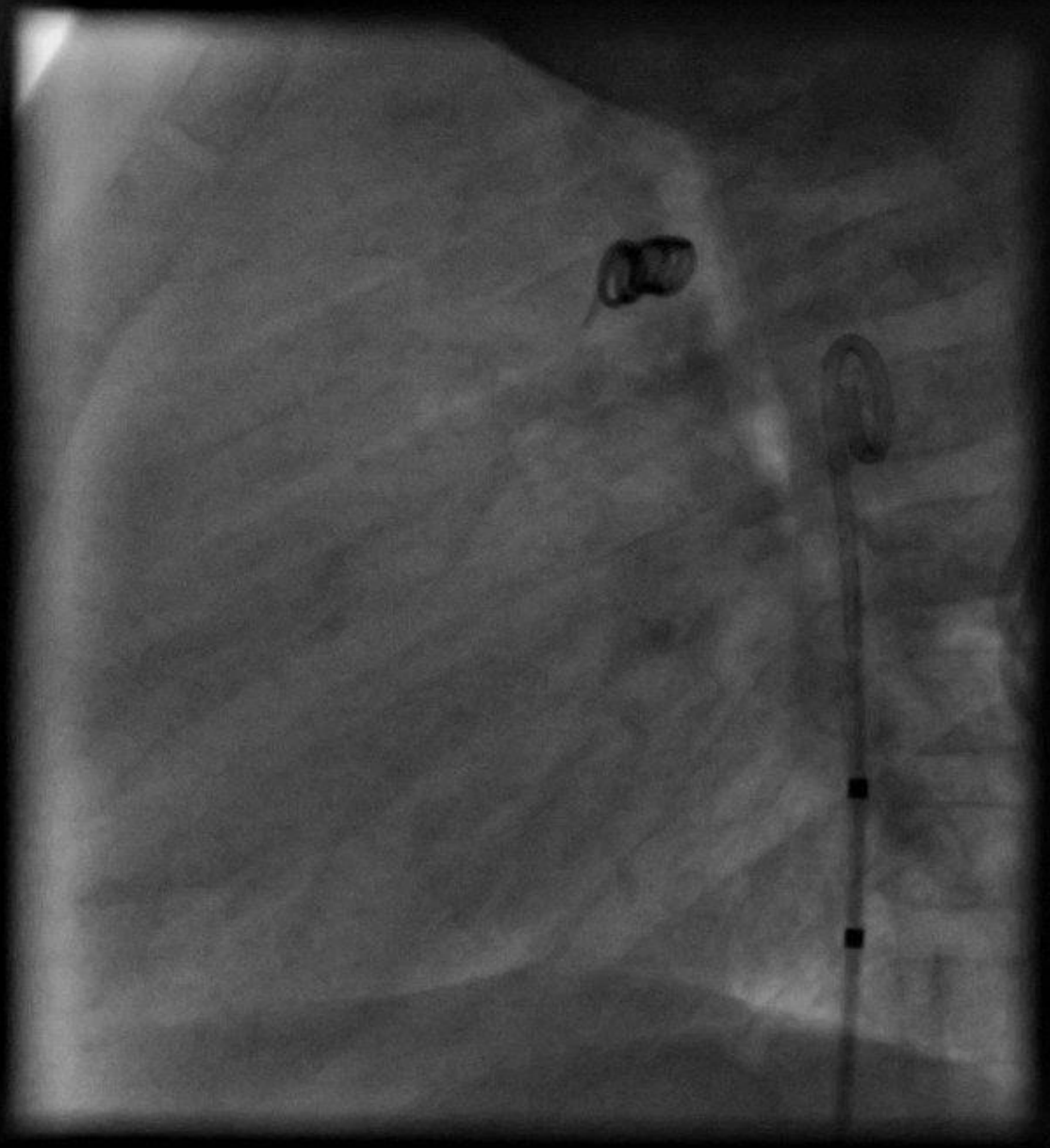


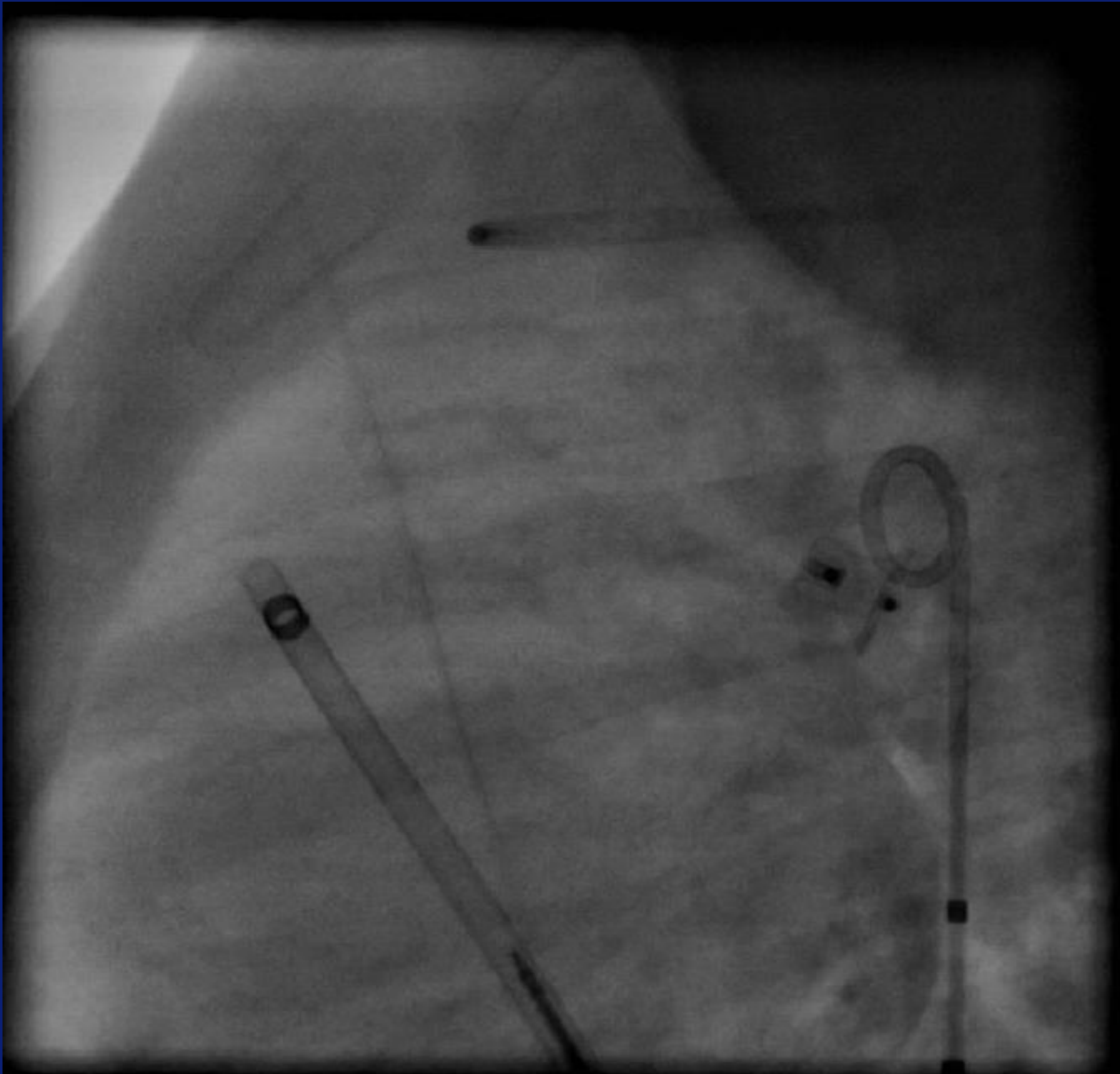
# Sluicing ODB



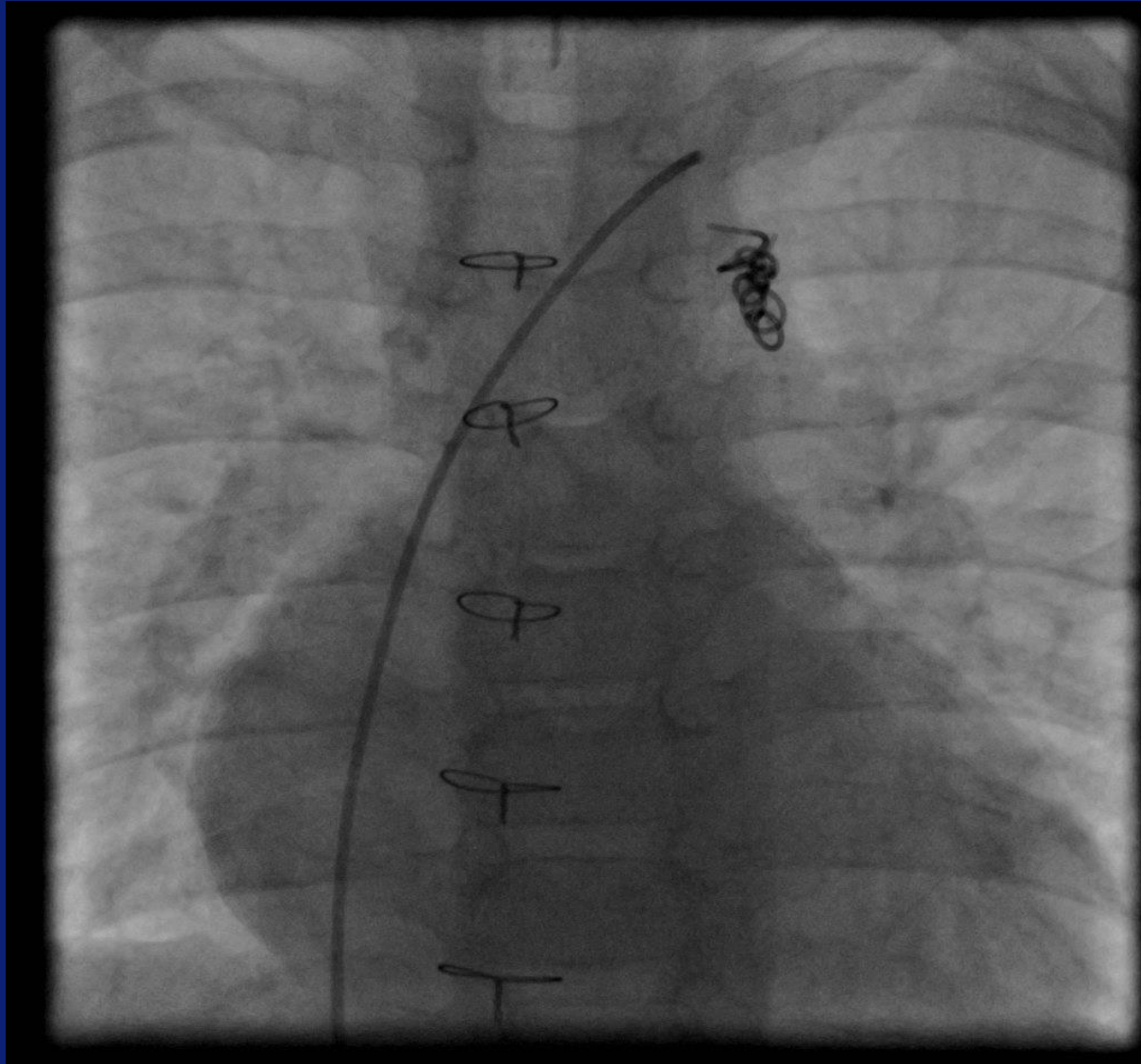




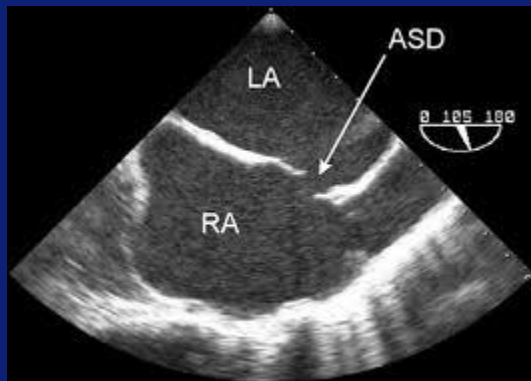
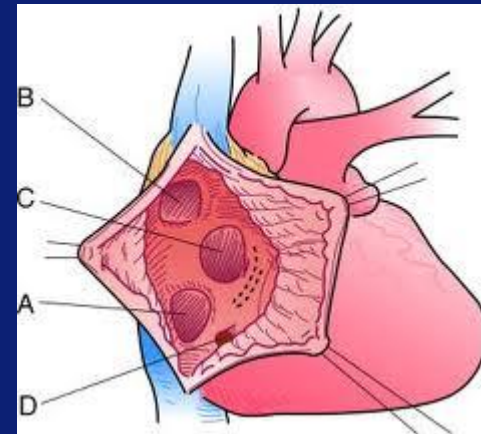
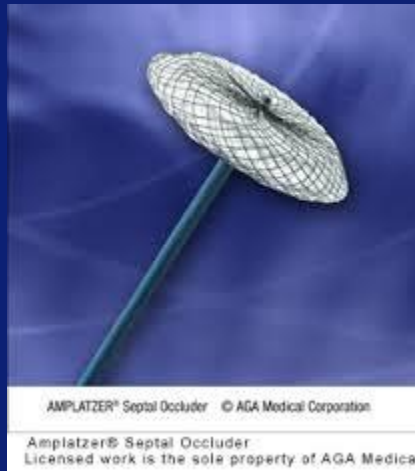
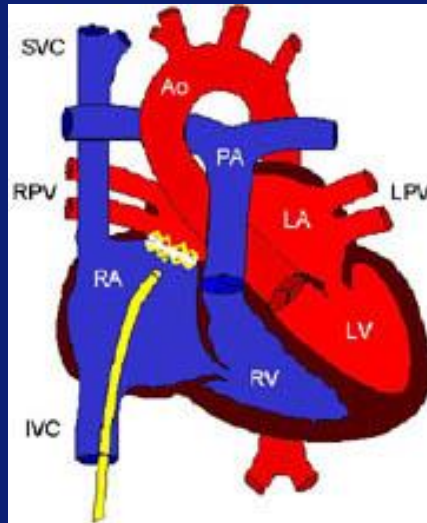


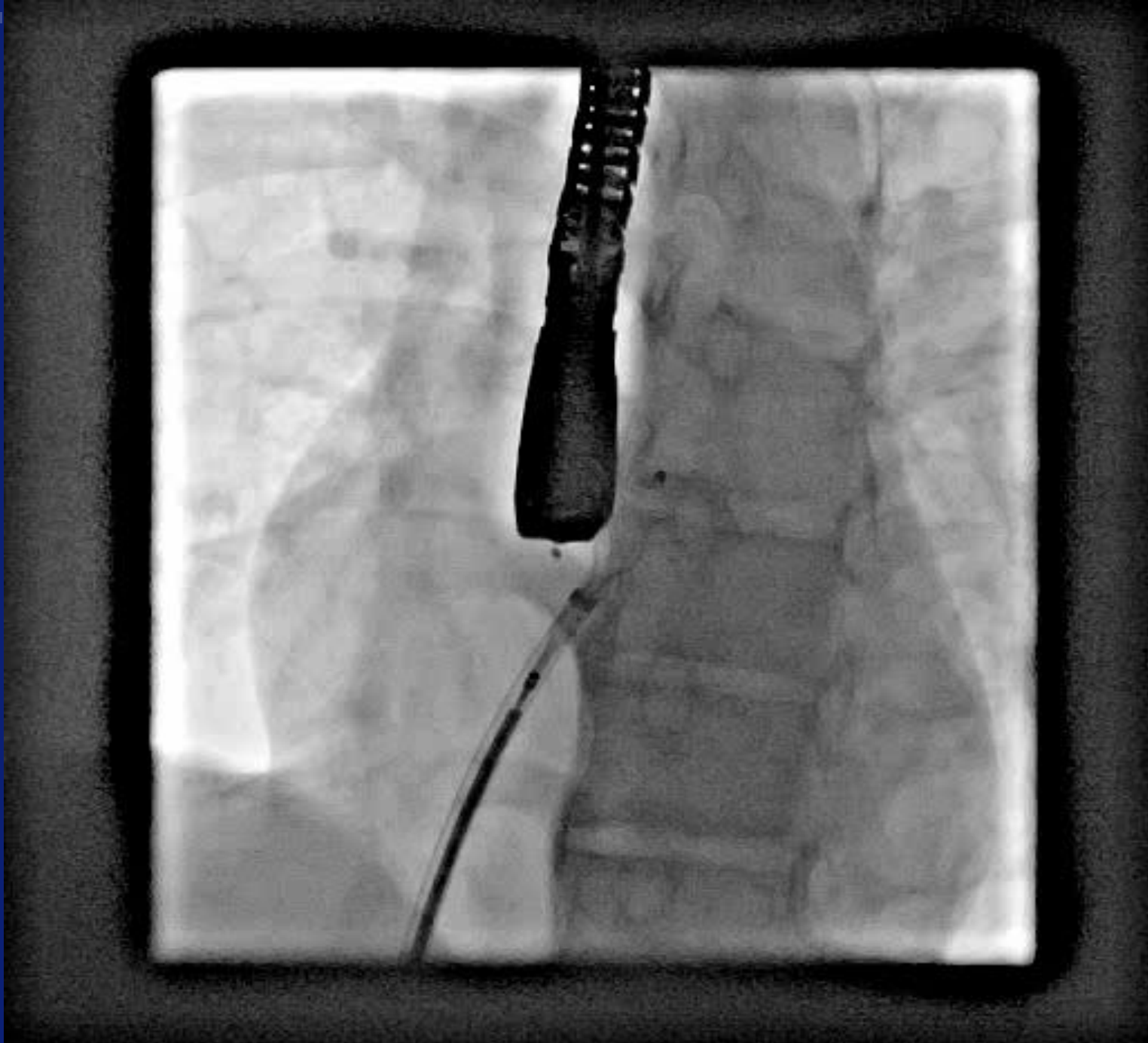


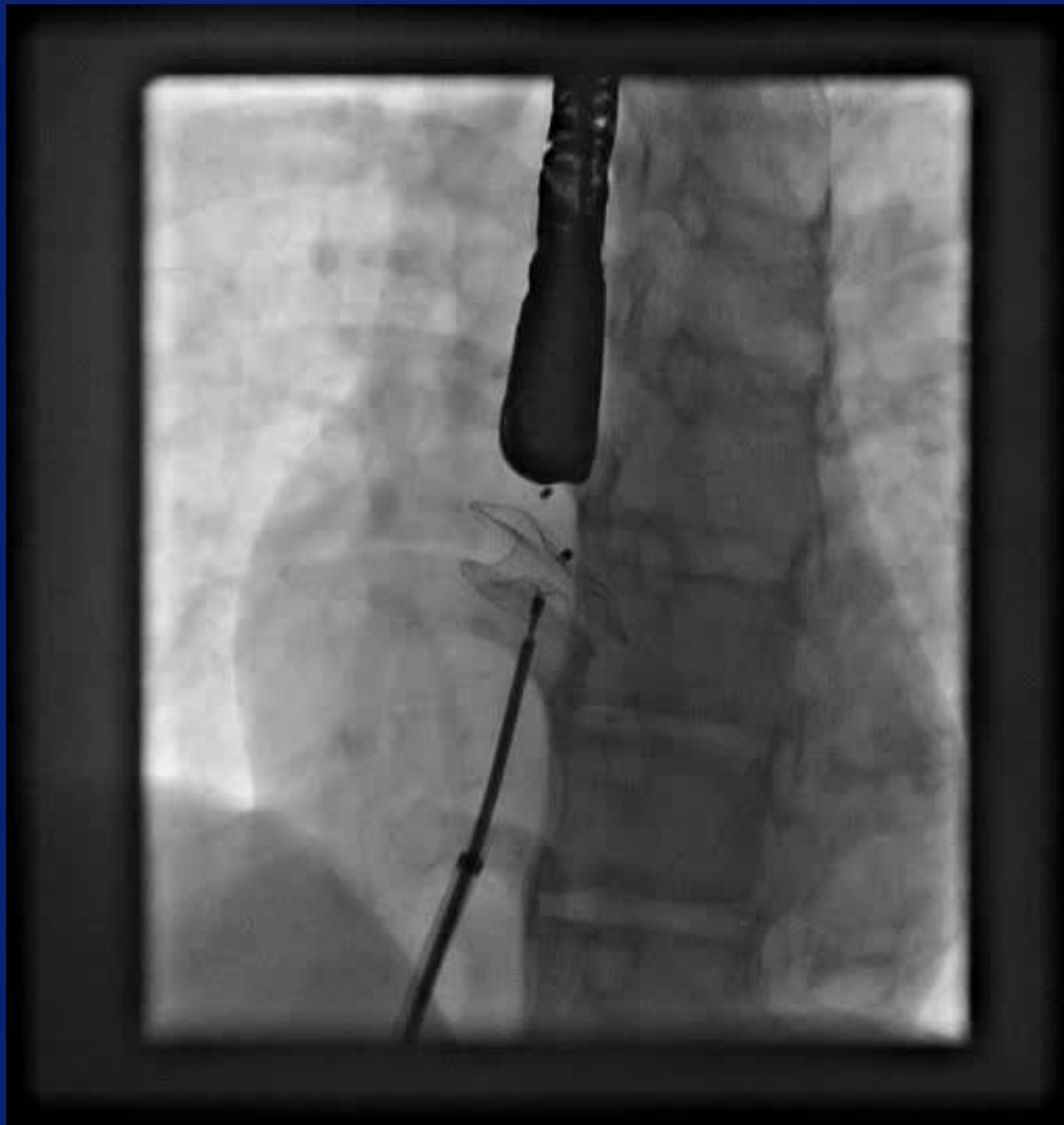
# Sluicing collateraal



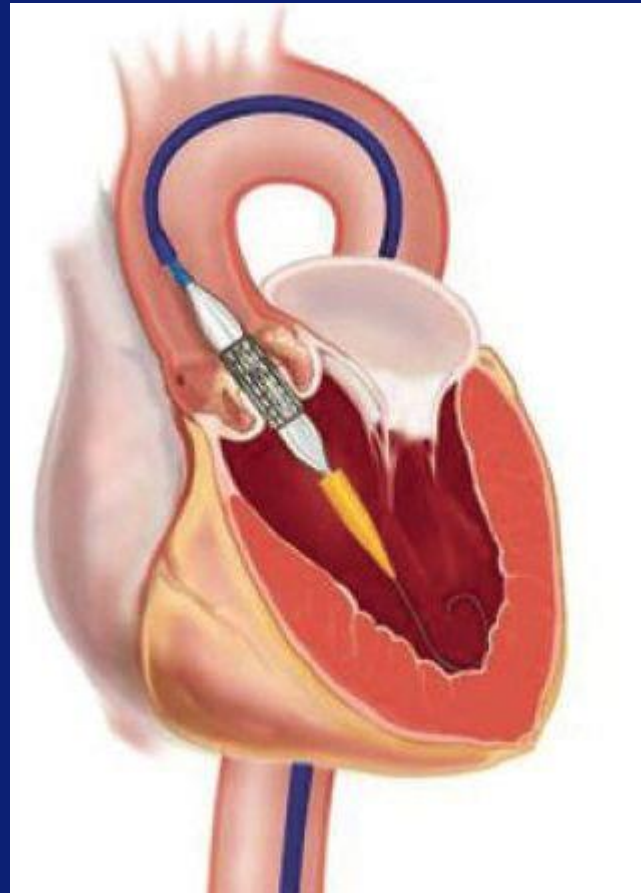
# Deviceplaatsing ASD



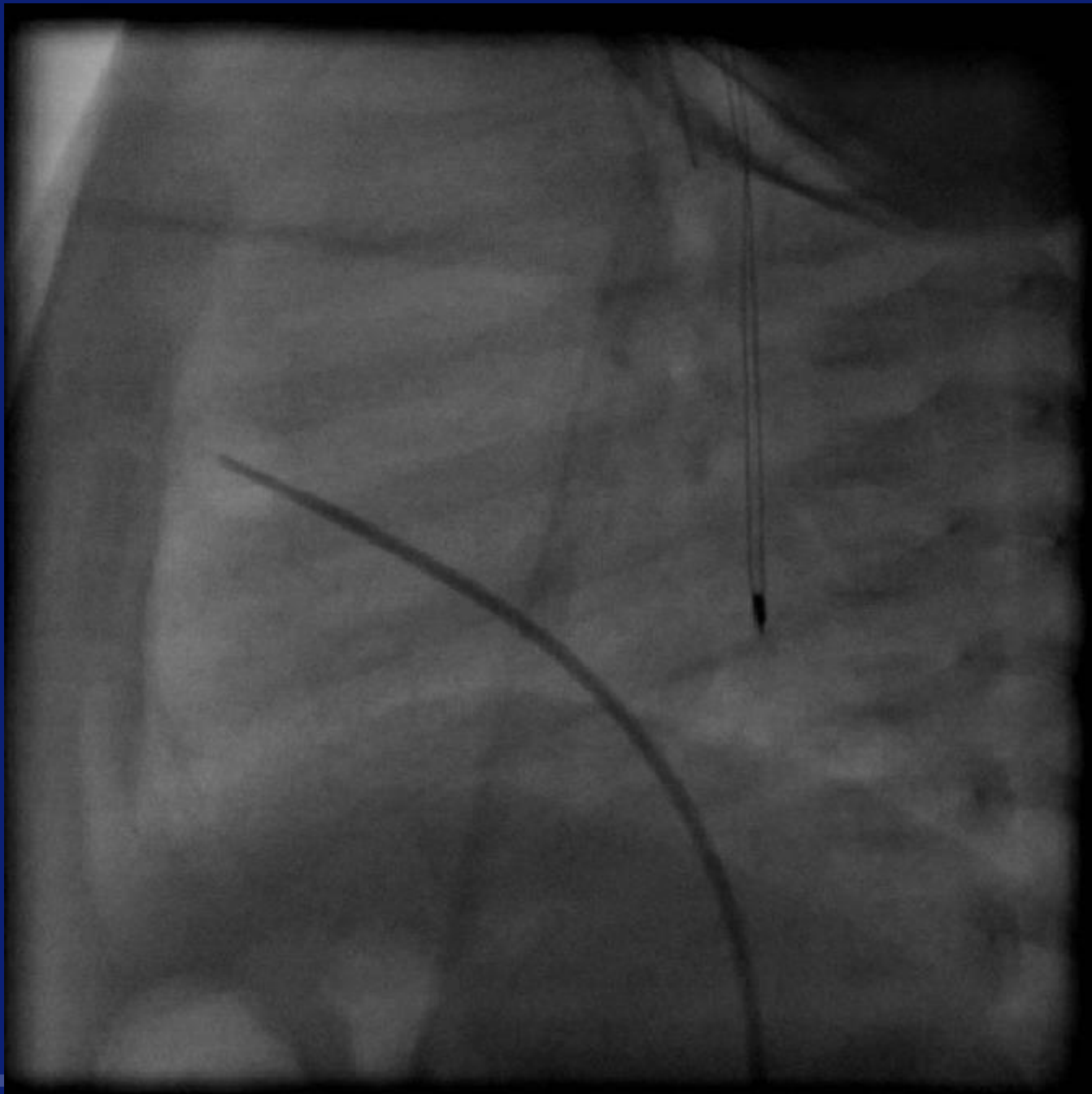


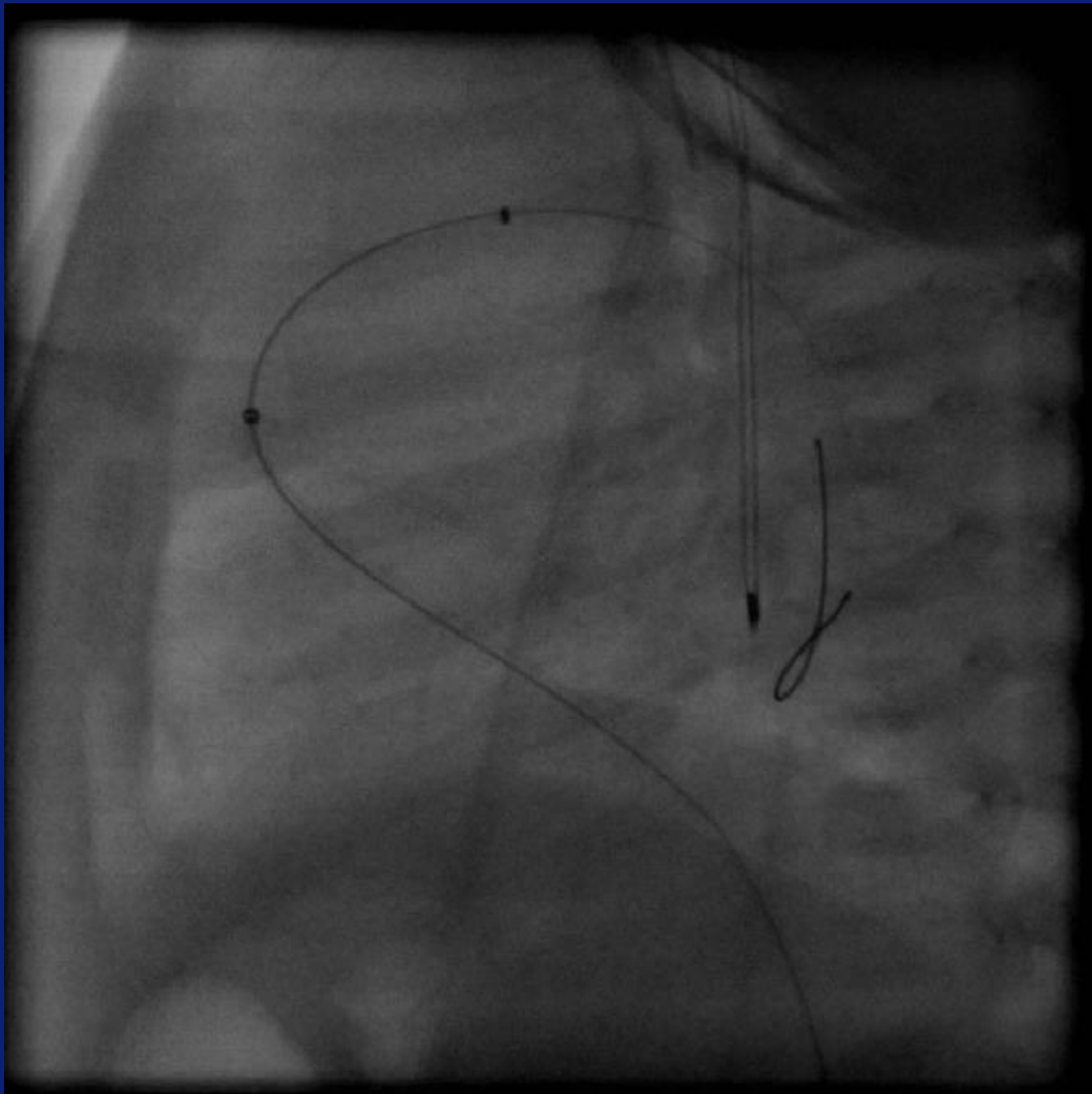


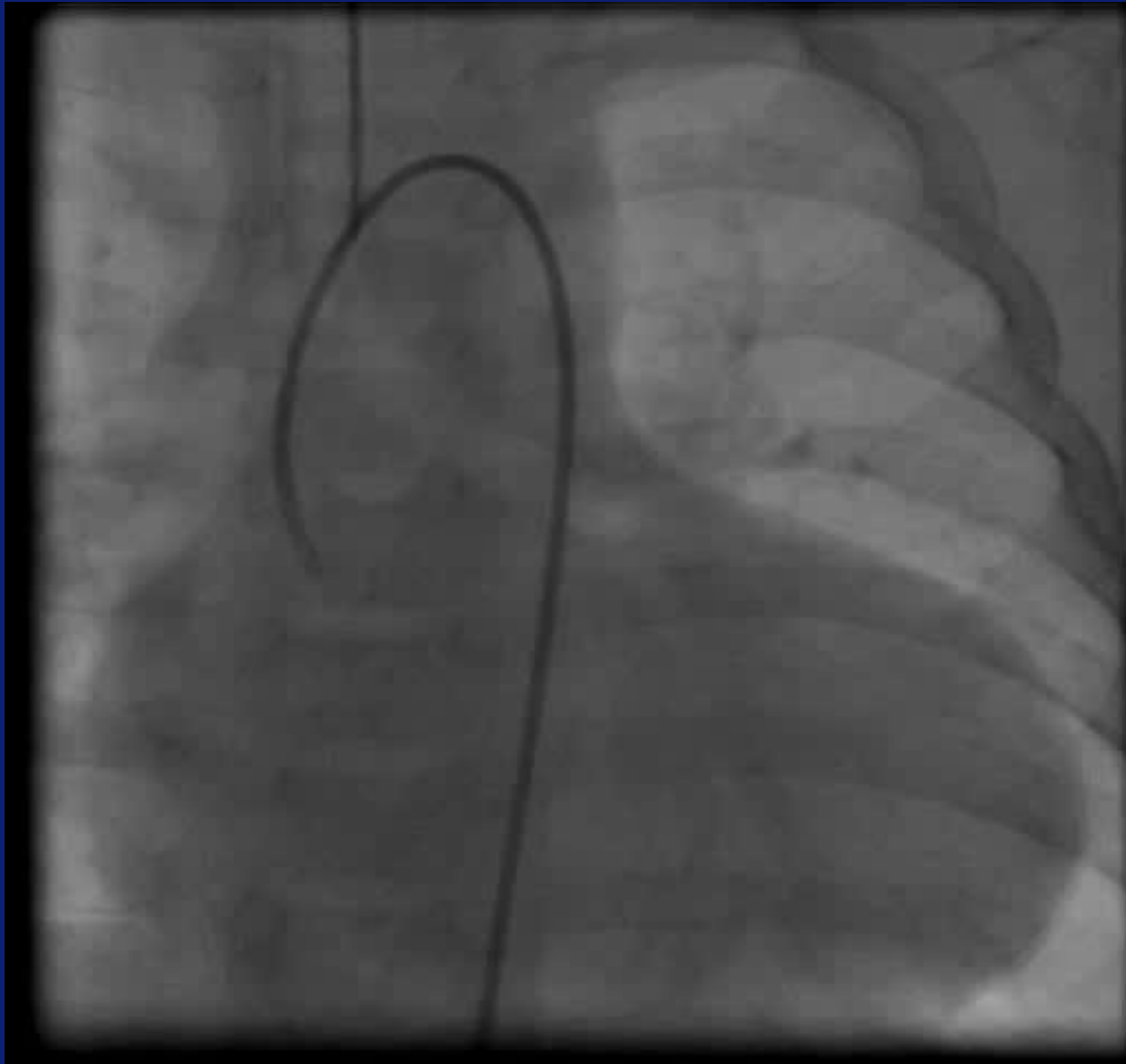
# Ballon angioplastiek

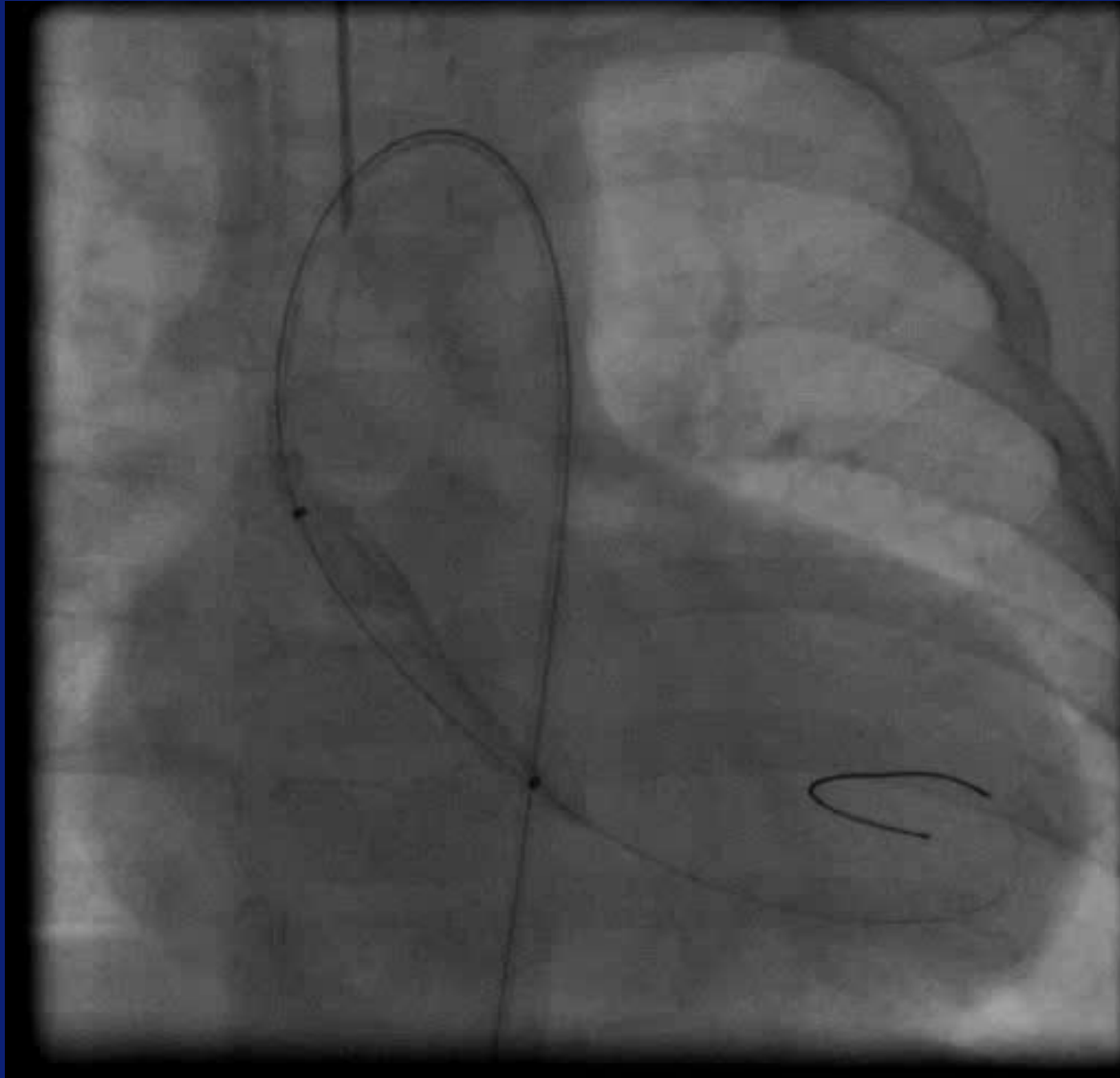




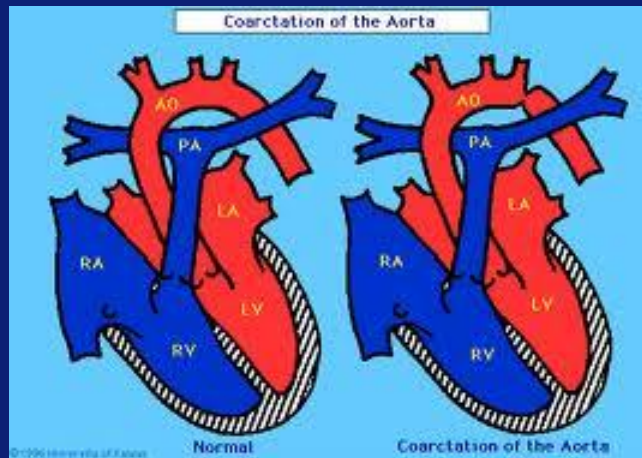


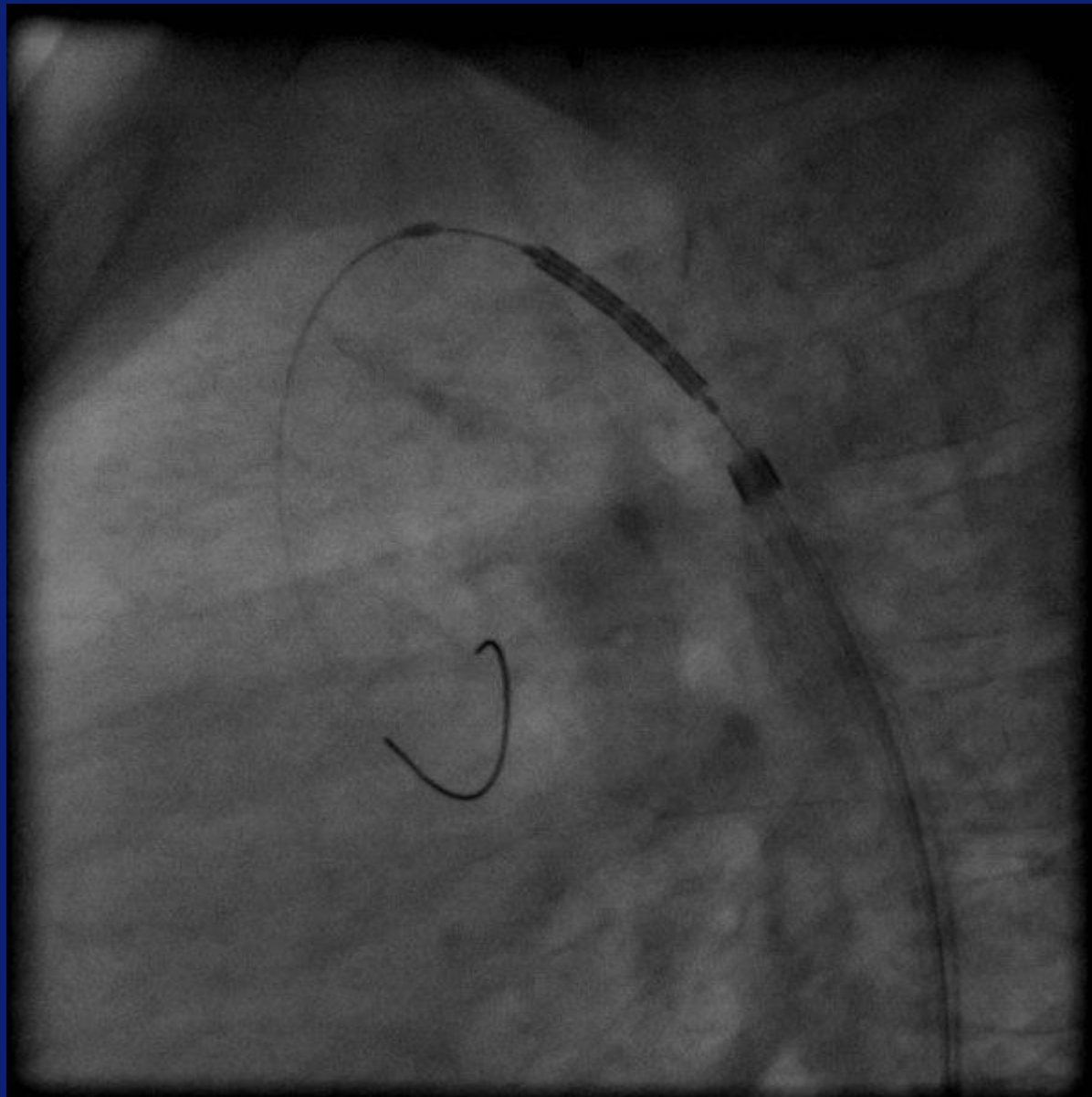


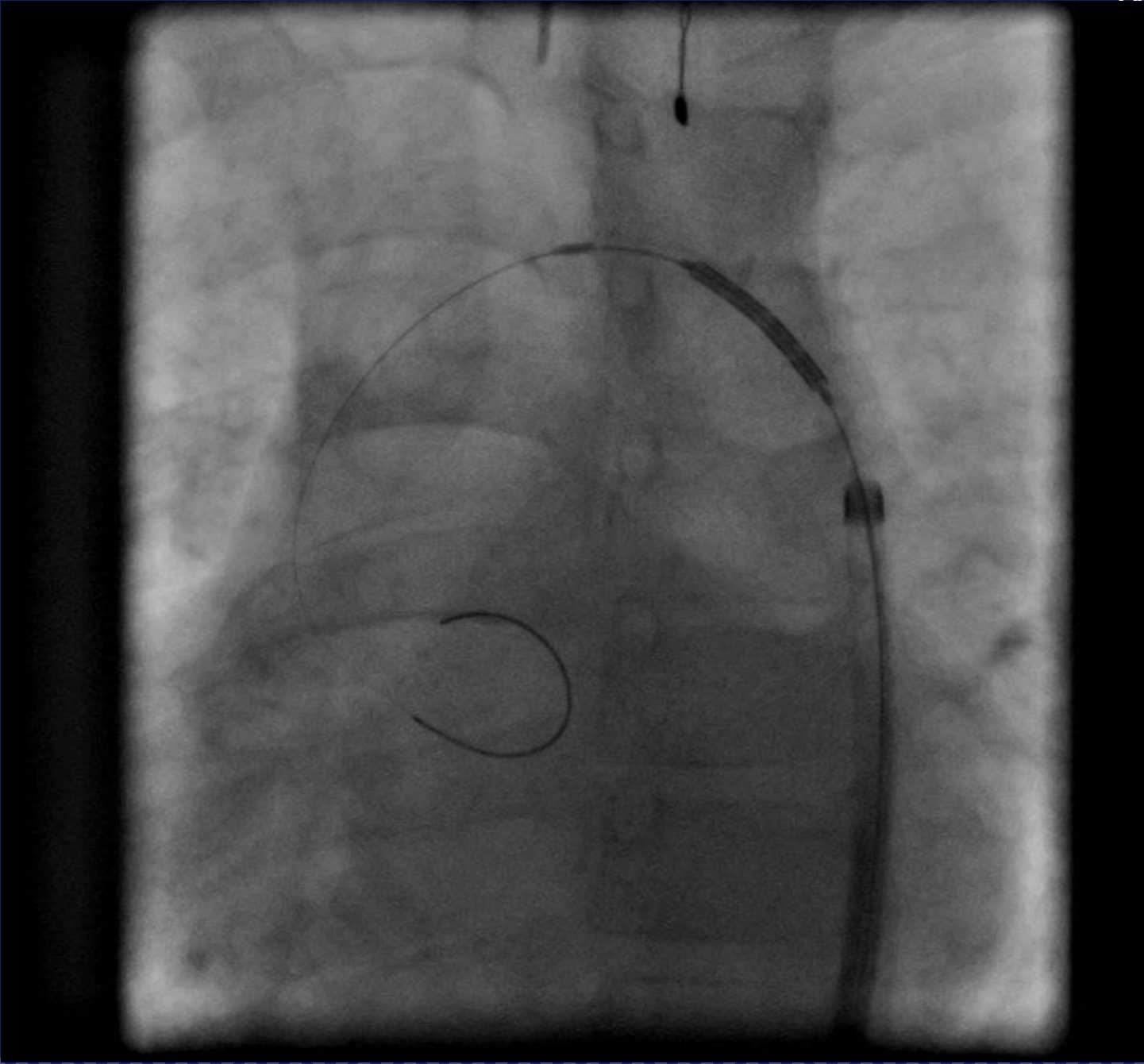




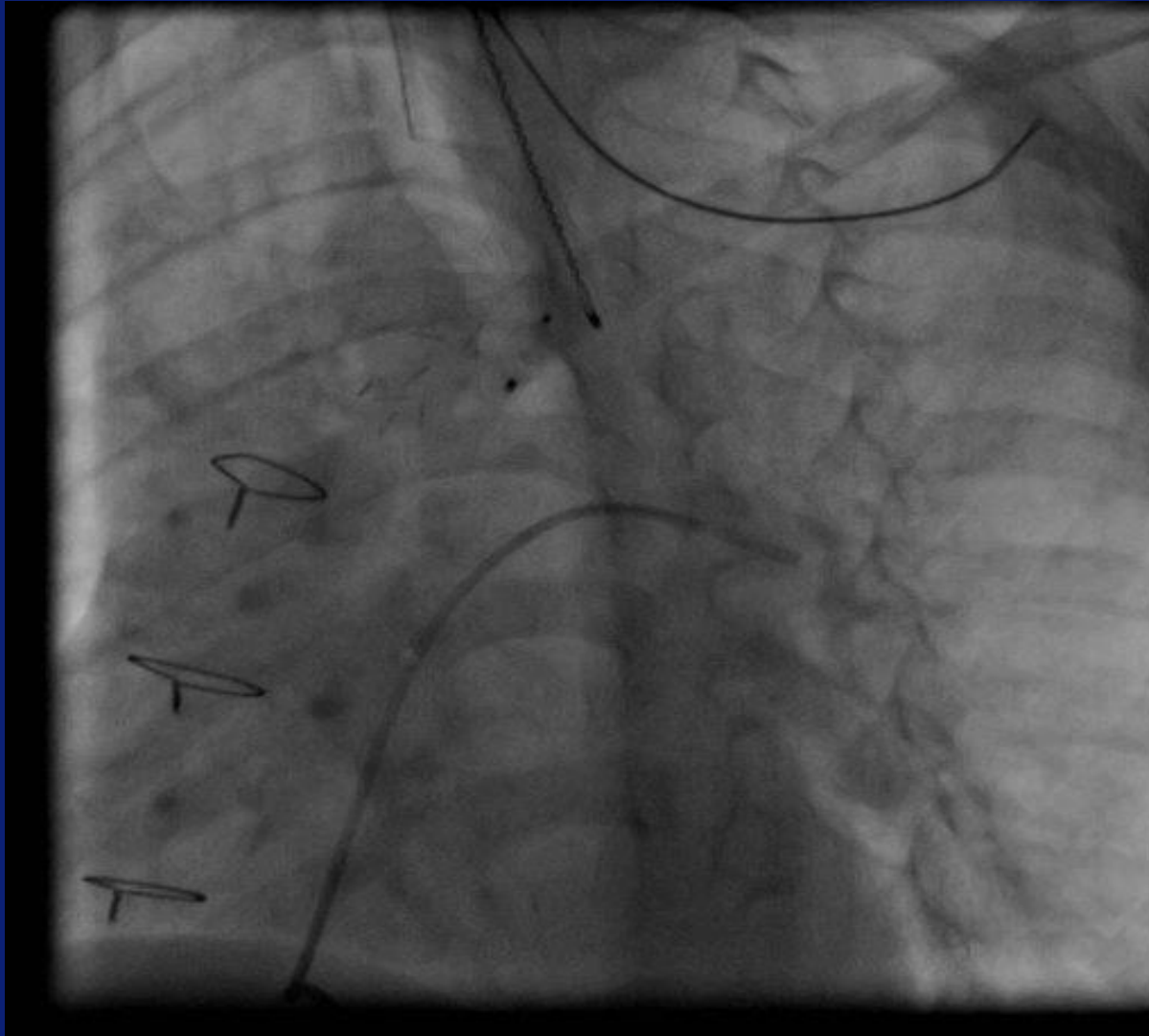
# Dilatatie Coarctatio Aortae





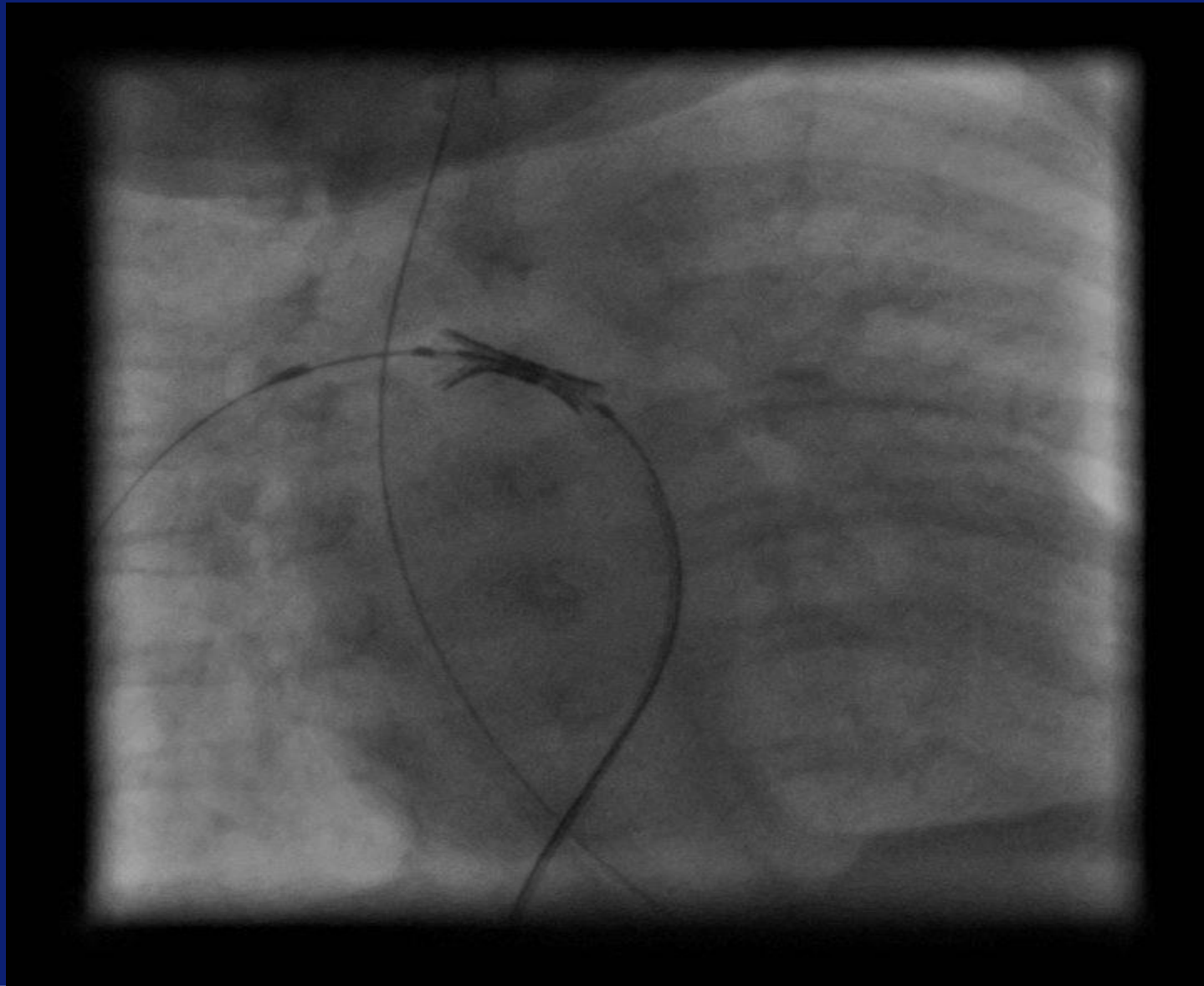


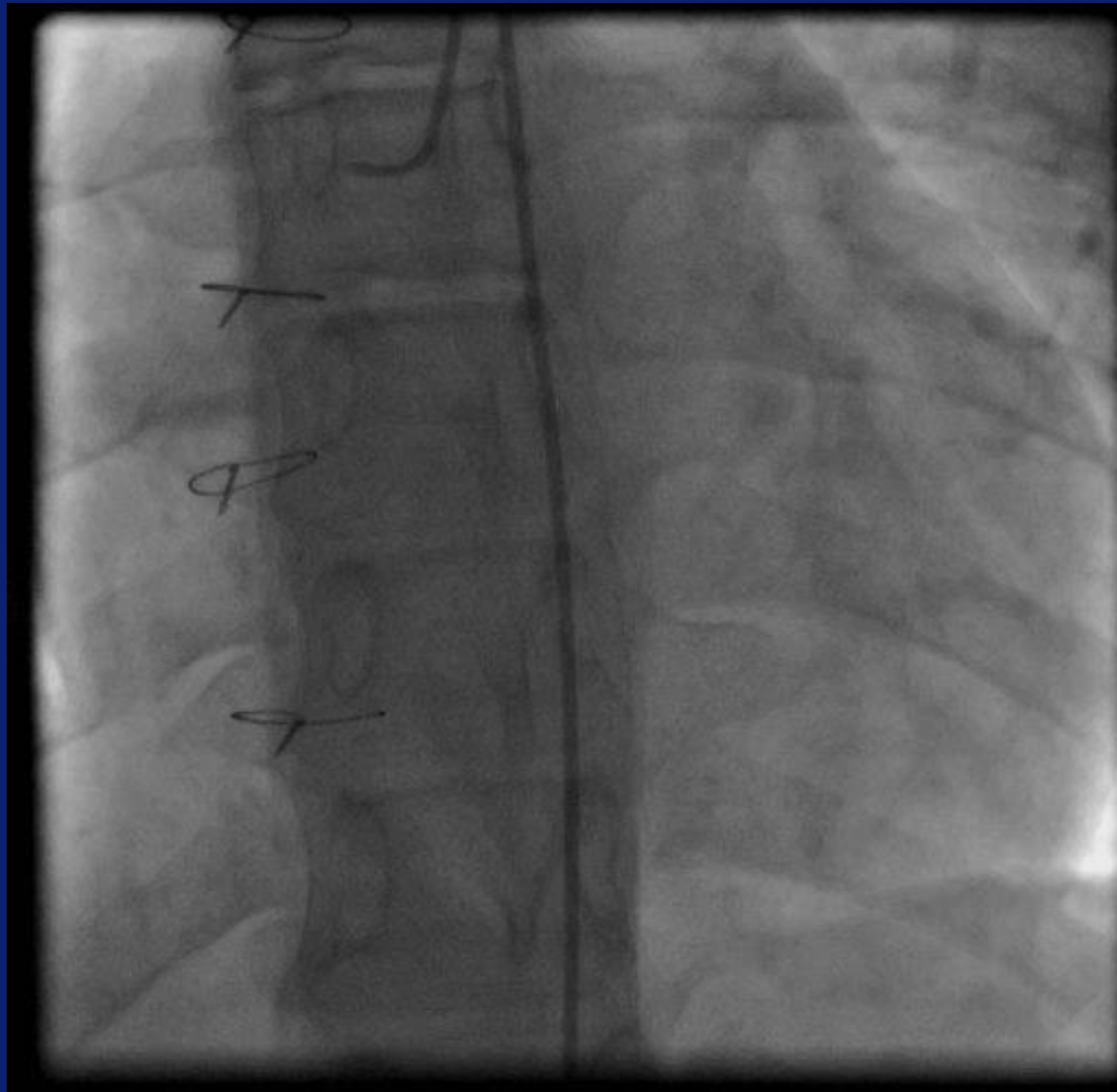
# Pulmonale coarctatie

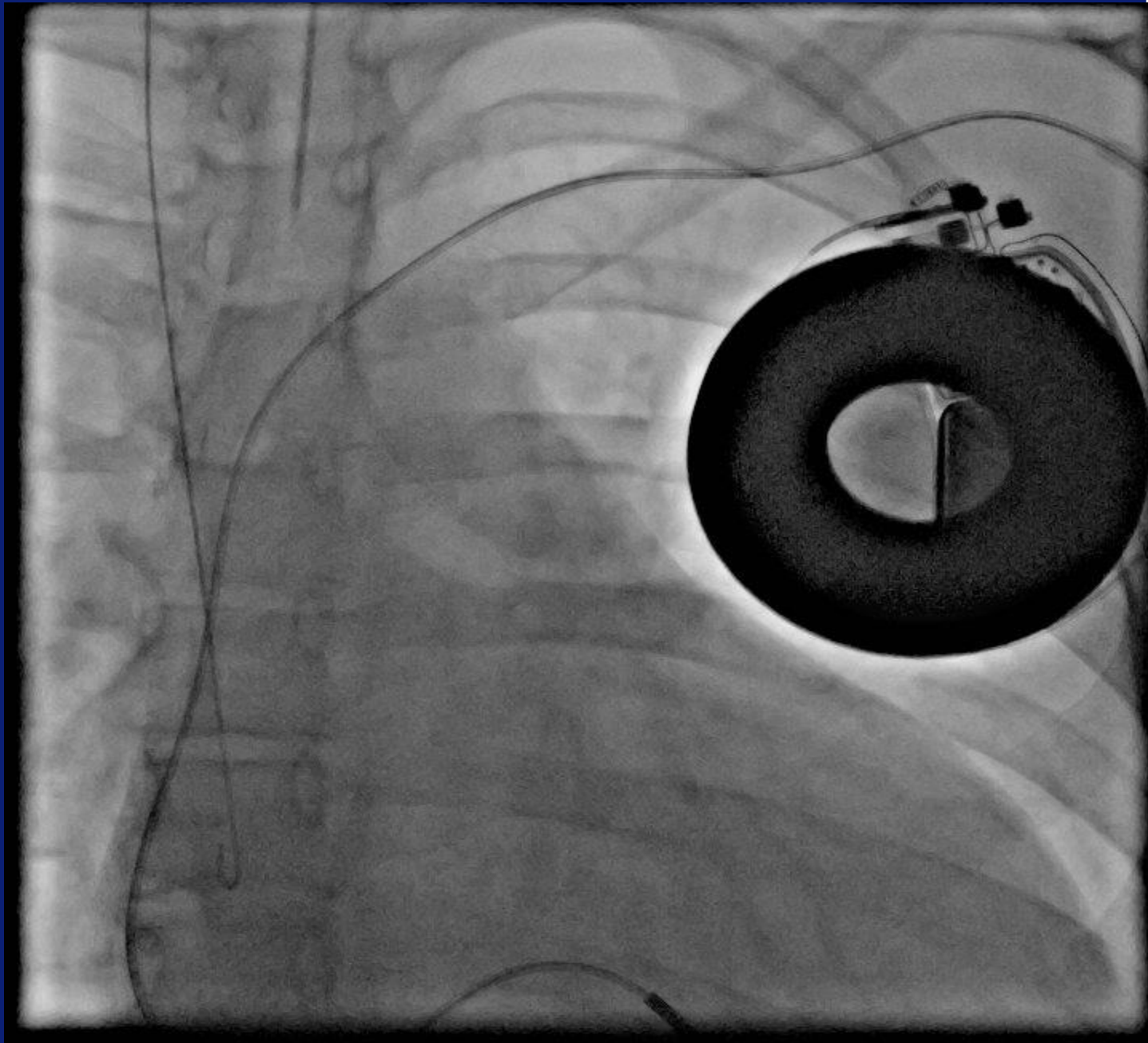




# Pulmonale coarctatie







# Samenvatting hartcatheterisatie

Veilig in ervaren handen

Diagnostisch en interventioneel

Technieken vorderen

Bijdrage aan bouwwerk groeit!



# Steeds meer kinderen te helpen ...

Rood



Geel



Wit



Blauw



Erasmus  
Ziekenhuis

# Stijgende kans op overleving ... !





Met dank aan  
Catheteriseurs Afdeling Kindercardiologie  
M Dalinghaus, M Witsenburg, **FA du Plessis**