Hypertensive Hypotension

It's deadly!

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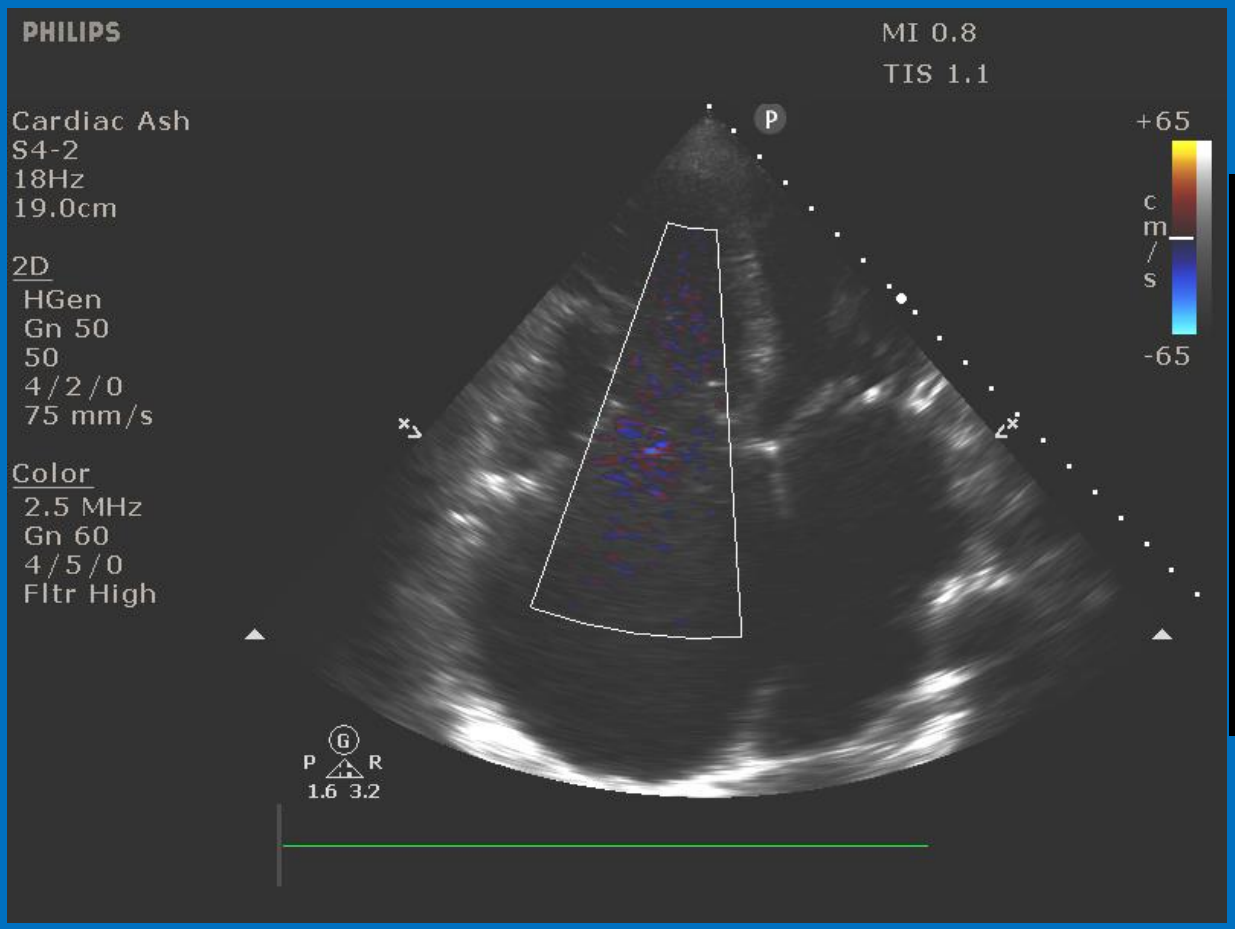
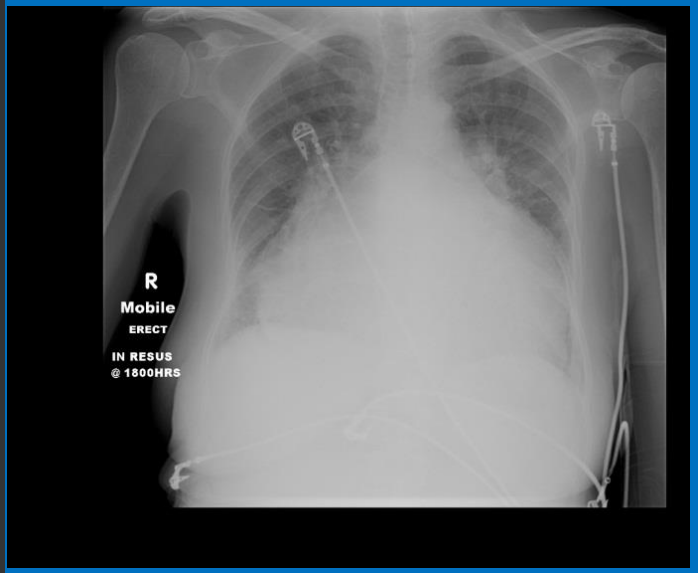
ACEM2018ASM ON THE EDGE PERTH18-22 NOVEMBER

T- 39.6°C	SpO_2- 88% RA	pH-7.30
HR-133	GCS-14	Lactate- 9.3
BP- 126/70	RR-30	ECG- AF

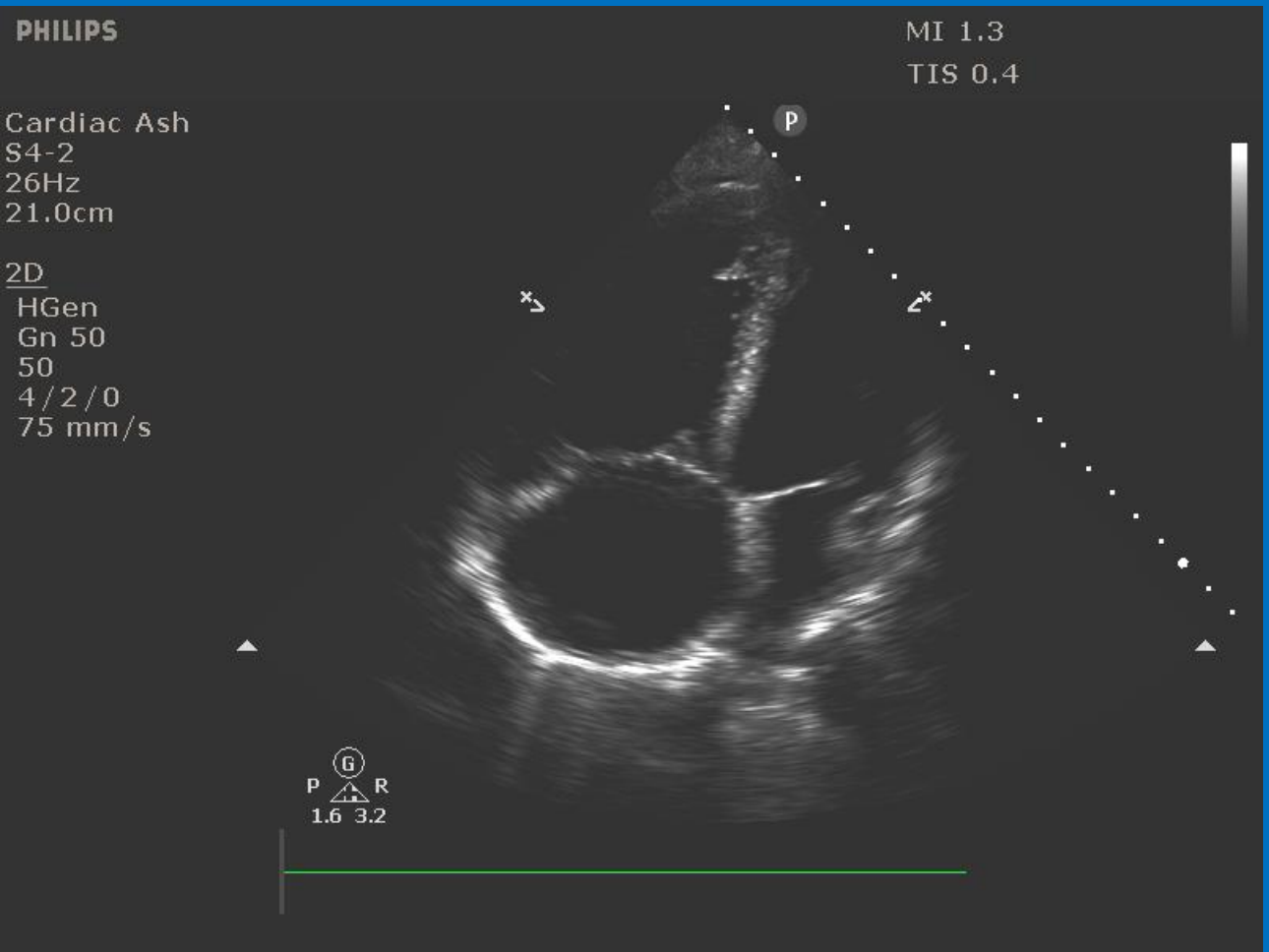
75 yr febrile and unwell

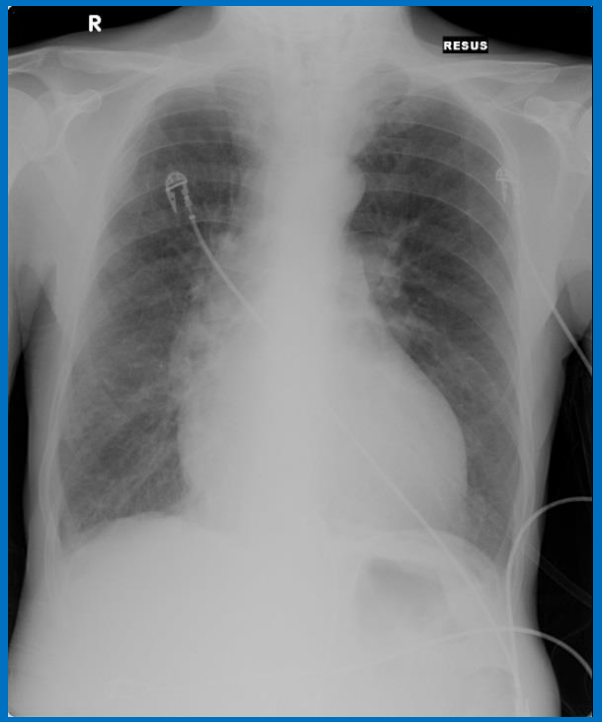




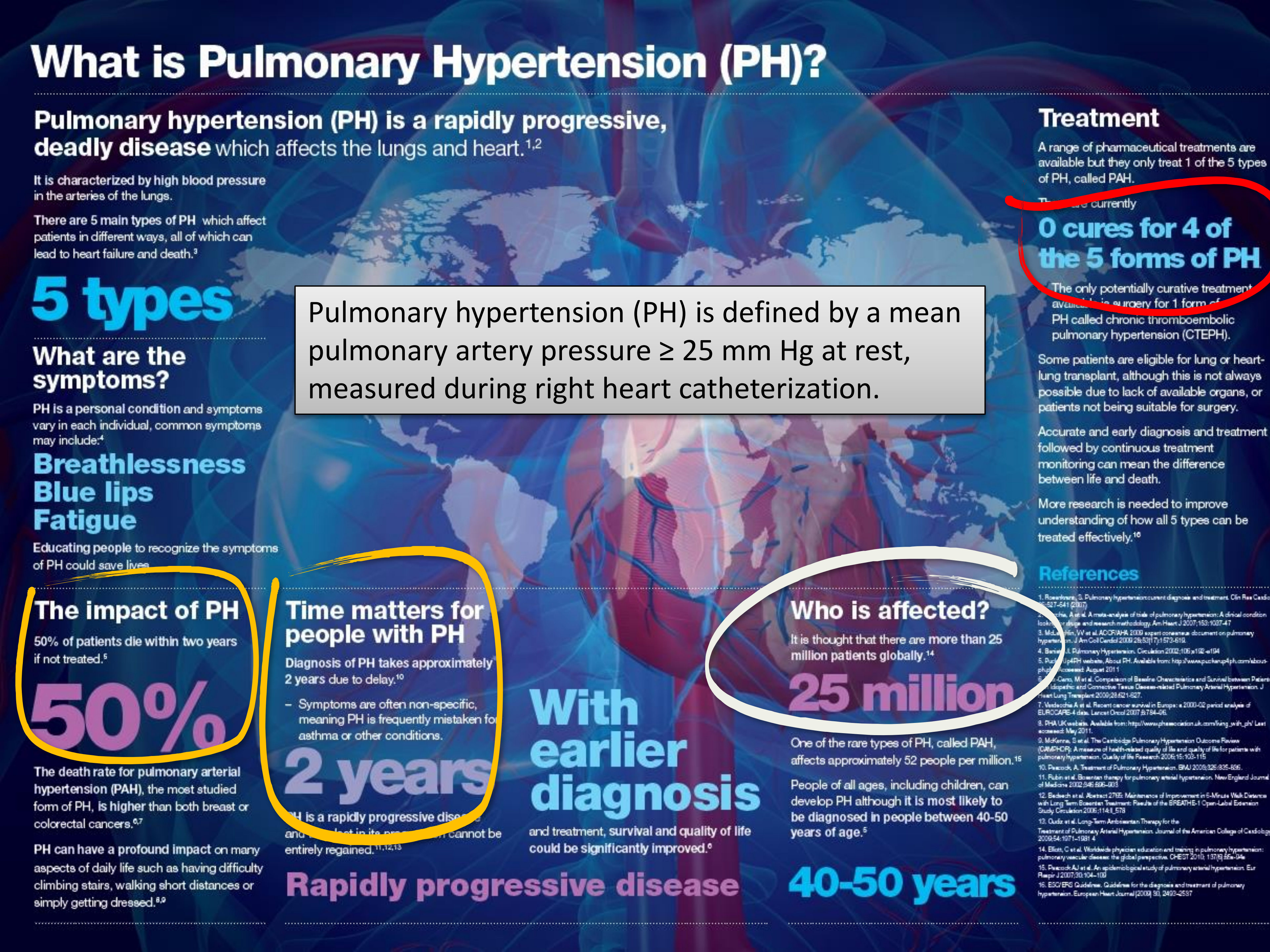
T- 38.4°C	SpO_2- 84% RA	pH-7.28
HR-113	GCS-15	Lactate- 4.8
BP- 130/70	RR-30	ECG- S Tachy

64yr
Febrile
with ↑SOB
and cough





Pulmonary hypertension (PH) is defined by a mean pulmonary artery pressure ≥ 25 mm Hg at rest, measured during right heart catheterization.



Setting of Acute illness in chronic PH

- RV failure [49%]
- Progressive Respiratory failure [18%]
- Sudden Cardiac death [17%]
- Cardiopulmonary resuscitation is rarely successful
- Hospital Mortality
  - 28% in Mild PH
  - 67% in moderate PH
  - 80% in Severe PH

Critical Care and Resuscitation 103-109 Volume 15 Number 2 June 2013

The sexy Stuff

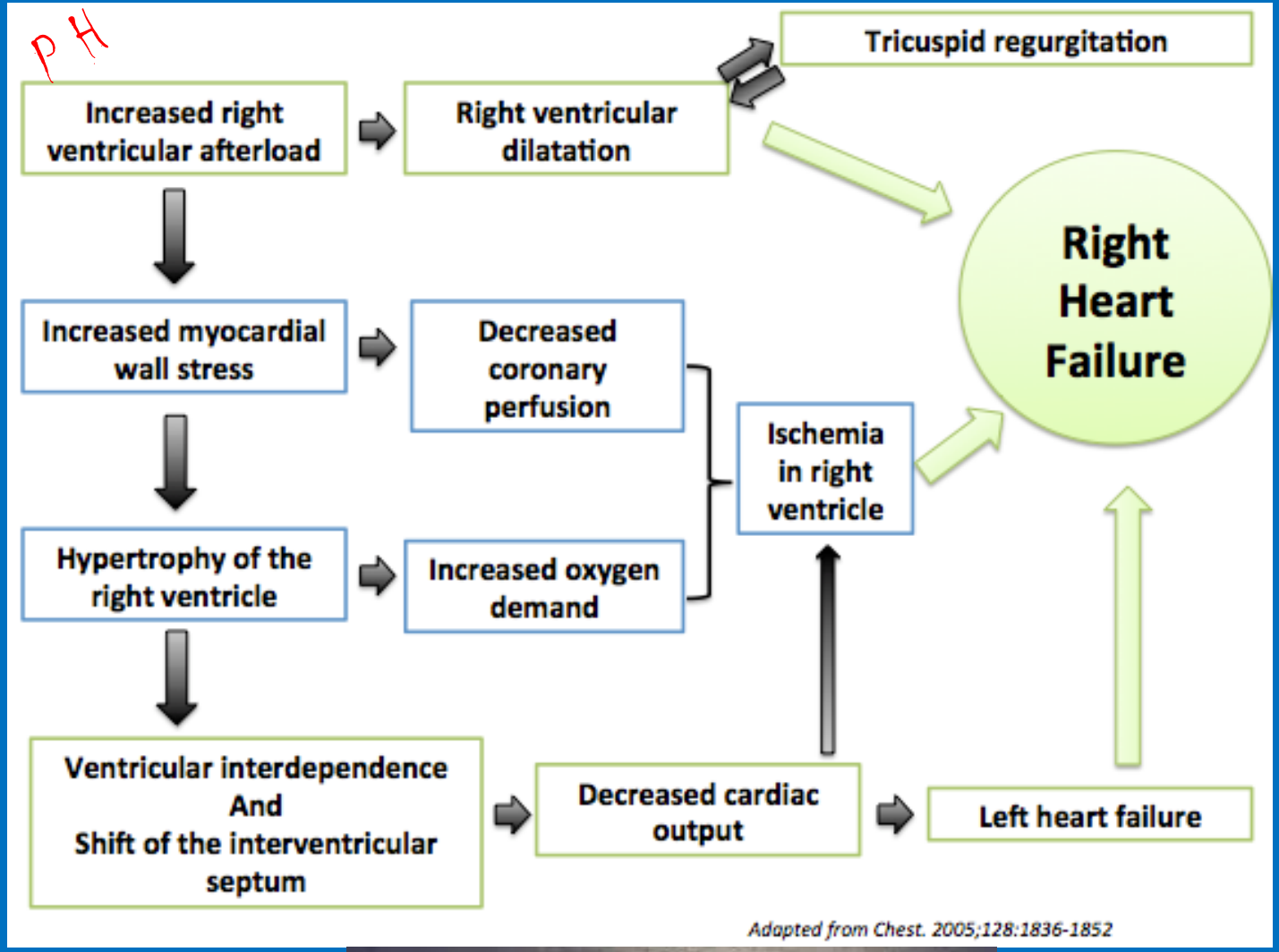
- Systemic circulation
- Left heart
- Systolic function

SOME STATISTICS:

100% of men didn't notice King Kong is on the picture

The not so sexy Stuff

- Pulmonary circulation
- Right heart
- Diastolic function


PH
Tricuspid regurgitation
Increased right ventricular afterload
Right ventricular dilatation
Right Heart Failure
Increased myocardial wall stress
Decreased coronary perfusion
Ischemia in right ventricle
Hypertrophy of the right ventricle
Increased oxygen demand
Ventricular interdependence And Shift of the interventricular septum
Decreased cardiac output
Left heart failure
Adapted from Chest. 2005;128:1836-1852

ECG

R in V1, RAD, RAE, RBBB and TWI

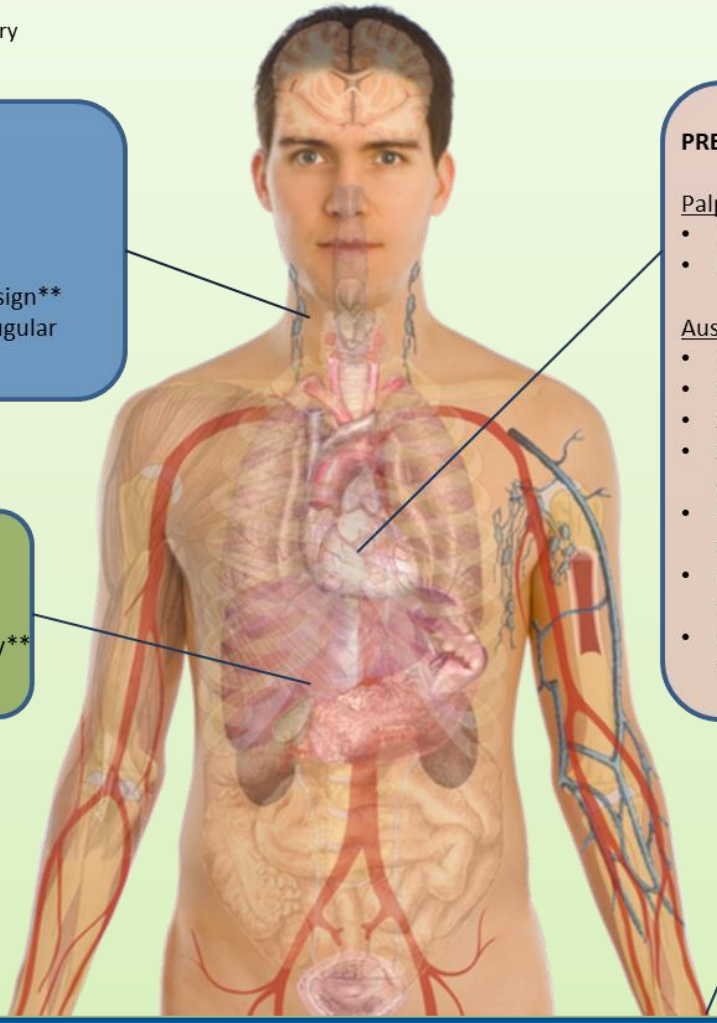
CXR

Prominent PA, peripheral pruning in PAH, and cardiomegaly

Pulmonary hypertension

Physical Examination

**These are later findings associated with the development of right heart failure secondary to pulmonary hypertension.



JVP

- Prominent 'a' wave
- Prominent 'v' wave
- Elevated JVP**
- Positive Kussmaul's sign**
- Positive Abdominojugular reflex**

PRECORDIUM

Palpation:
- Parasternal heave
- Palpable p2

Ausculation:
- Loud P2
- Narrowed/widening of S2
- S4, S3**
- Systolic pulmonary ejection click
- Ejection midsystolic pulmonic murmur
- Diastolic pulmonary regurgitation murmur
- Pansystolic tricuspid regurgitation murmur**

ABDOMEN

- Ascites**
- Painful hepatomegaly**
- Pulsatile liver**

LEGS

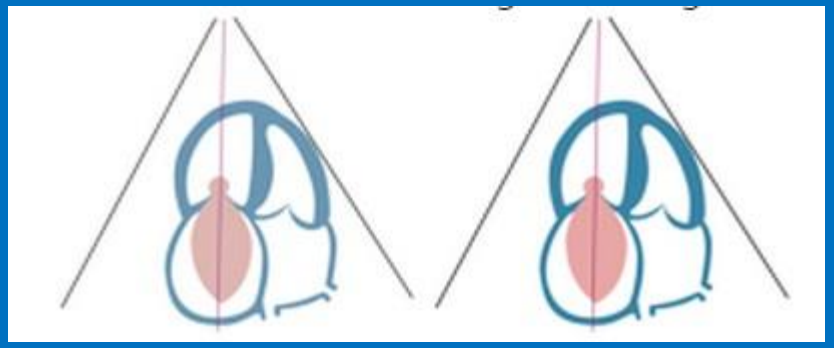
- Edema**

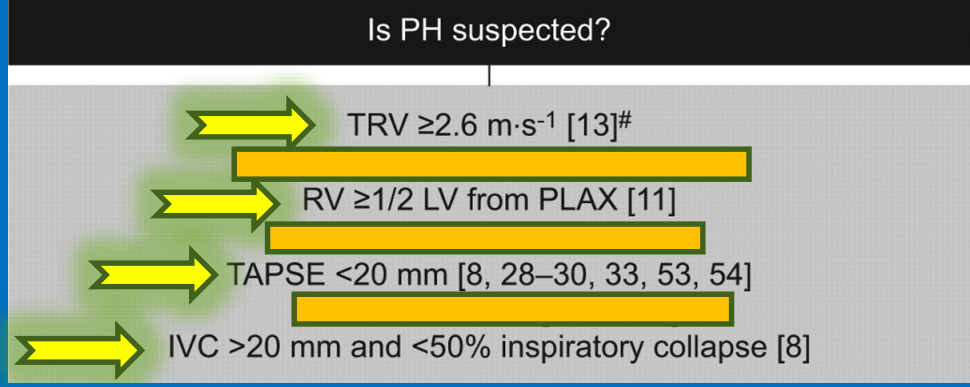
PULSE

- Diminished**

2D Echocardiogram

$PASP = RVSP = 4 \times [TR\ V_{max}]^2 + RAP$





IVC (diameter)	Inspiration	RA pressure
small (	Collapsing	0— 5 mmHg
normal (1.5- 2.5cm)	> 50% diameter reduction	5— 10 mmHg
dilated (>2.5cm)		10— 15 mmHg
IVC + liver veins dilated	no diameter change	> 20 mmHg

Infection, anemia, arrythmia, hypoxia, hypercarbia, acidosis

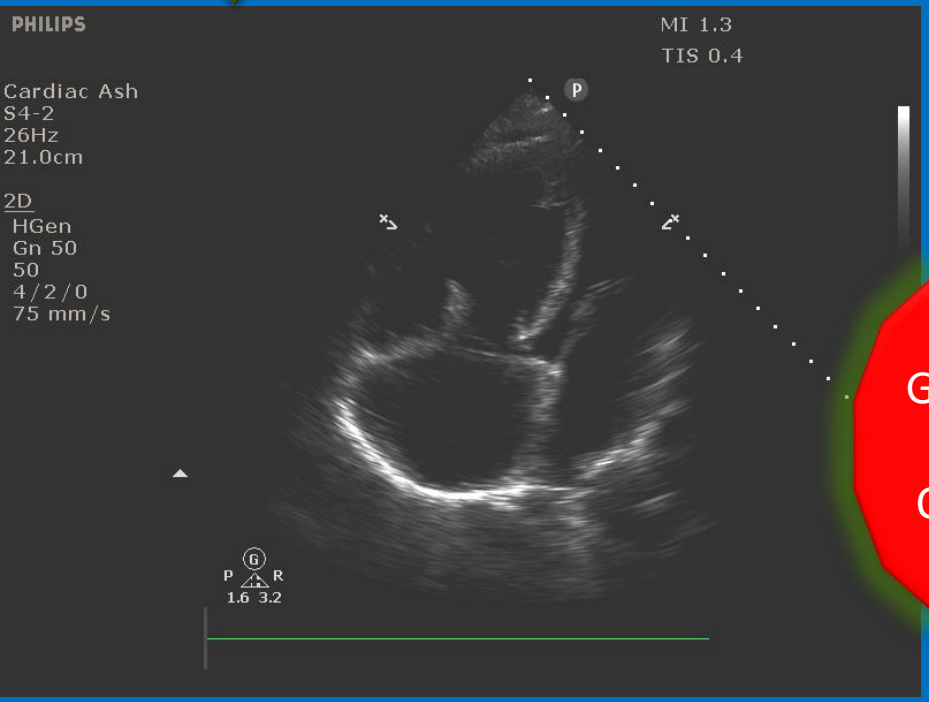
Treat trigger

Cautious IV fluids
Diuretics/filtration

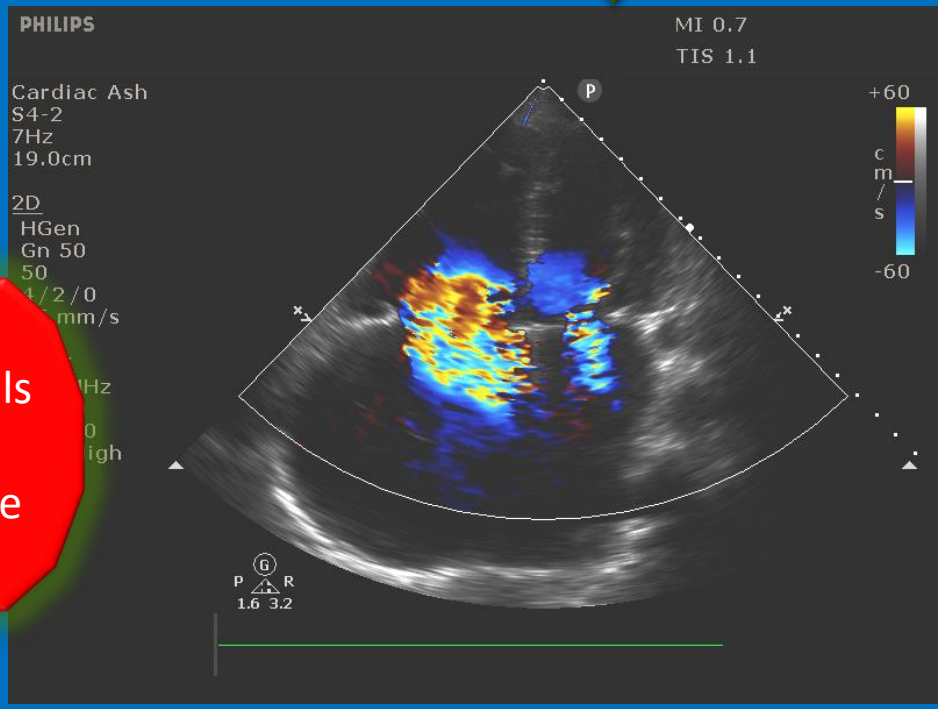
Fluid balance

Noradrenaline
Vasopressin

Perfusion pressure



Goals of Care



Cardiac Output

Dobutamine, Milrinone, Levosimendan

RV Afterload

NO, Prostacyclins..

Bridge to Definitive therapy

ECMO, Transplant

Hypertensive Hypotension

Systolic BP < 90 or MAP <65

Call expert help! Complete assessment of shock

LV and Lungs
+
TR V_{max}
TAPSE
RVD
IVC

Echo looking for LV & RV function

Suggestion of Pulmonary hypertension

PE or RV infarct

Treat accordingly

Fluid
200ml boluses

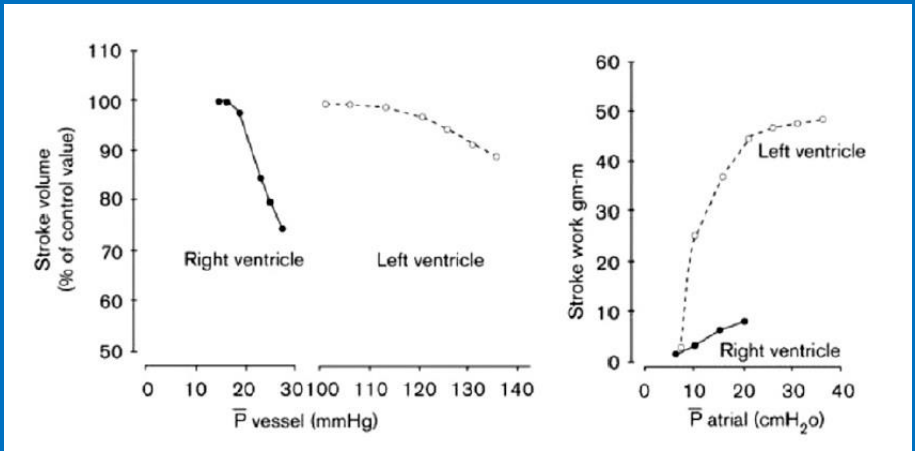
Dobutamine
Infusion

Norad
infusion

Milrinone

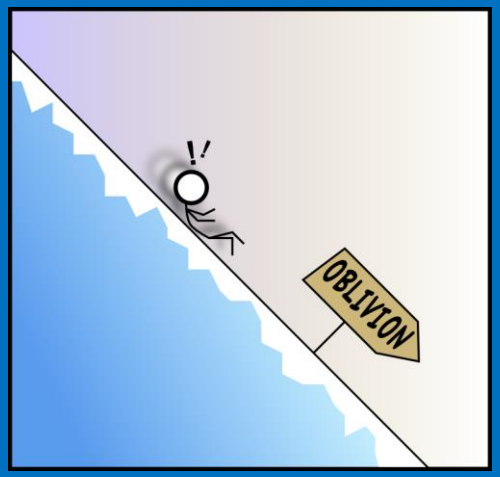
Levosimendan

Treat Trigger
Discuss Goals of Care
Arterial line
Central Line



Nitric Oxide
Prostacyclins

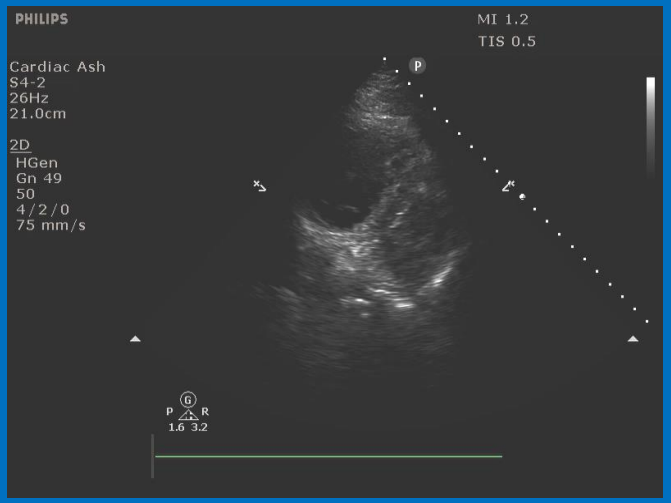
You have decided to Intubate

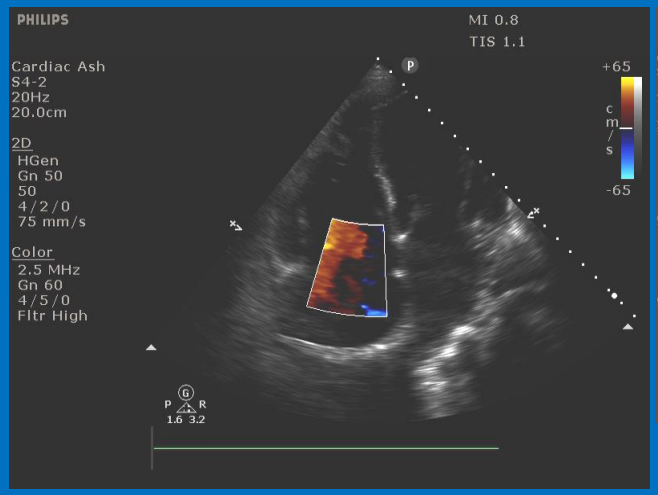


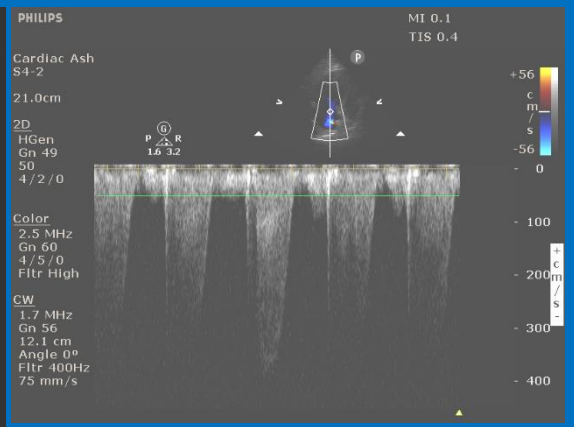
Preparation	Induction	Paralysing	Ventilation
• Pre-oxygenation • Invasive monitoring • Vasoactive	• Fentanyl • Propofol • Ketamine • Ketofol	• Suxamethonium • Rocuronium • Apnoea	• PEEP • TV

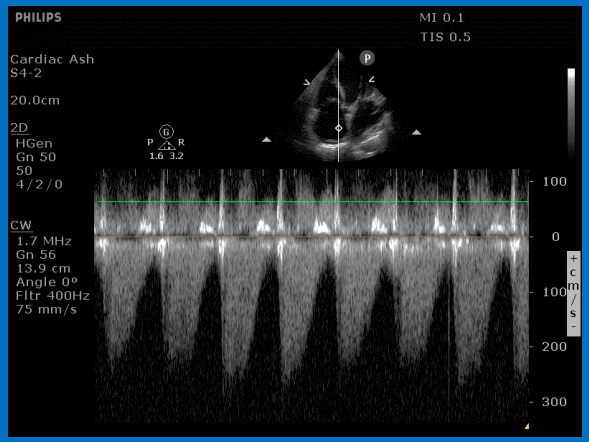
Conclusion

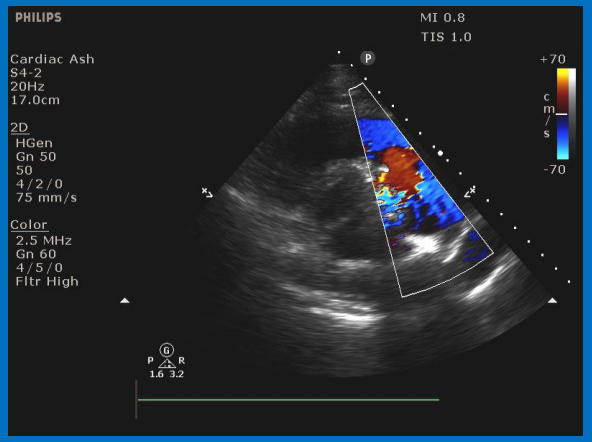
- Pulr
- Righ t
- Ech nd ther
- Goa

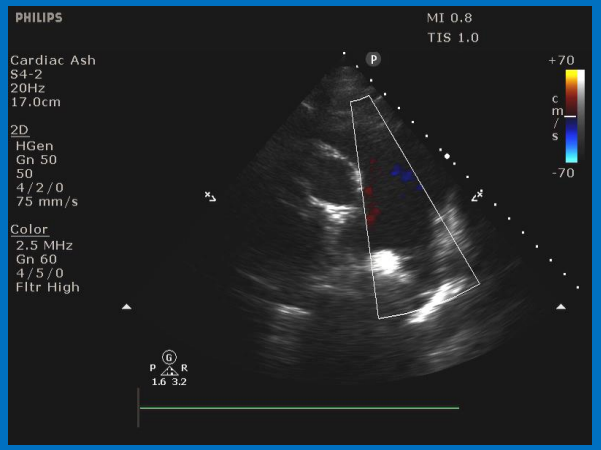

PHILIPS
MI 1.2
TIS 0.5
Cardiac Ash
S4-2
26Hz
21.0cm
2D
HGen
Gn 49
50
4/2/0
75 mm/s


PHILIPS
MI 0.8
TIS 1.1
Cardiac Ash
S4-2
20Hz
20.0cm
2D
HGen
Gn 50
50
4/2/0
75 mm/s
Color
2.5 MHz
Gn 60
4/5/0
Fltr High
+65
cm/s
-65


PHILIPS
MI 0.1
TIS 0.4
Cardiac Ash
S4-2
21.0cm
2D
HGen
Gn 49
50
4/2/0
Color
2.5 MHz
Gn 60
4/5/0
Fltr High
CW
1.7 MHz
Gn 56
12.1 cm
Angle 0°
Fltr 400Hz
75 mm/s
+56
-56
0
100
200
300
400


PHILIPS
MI 0.1
TIS 0.5
Cardiac Ash
S4-2
20.0cm
2D
HGen
Gn 50
50
4/2/0
CW
1.7 MHz
Gn 56
13.9 cm
Angle 0°
Fltr 400Hz
75 mm/s
100
0
100
200
300


PHILIPS
MI 0.8
TIS 1.0
Cardiac Ash
S4-2
20Hz
17.0cm
2D
HGen
Gn 50
50
4/2/0
75 mm/s
Color
2.5 MHz
Gn 60
4/5/0
Fltr High
+70
cm/s
-70


PHILIPS
MI 0.8
TIS 1.0
Cardiac Ash
S4-2
20Hz
17.0cm
2D
HGen
Gn 50
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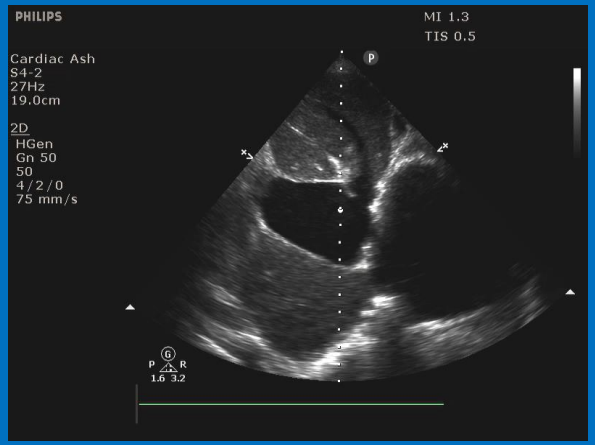
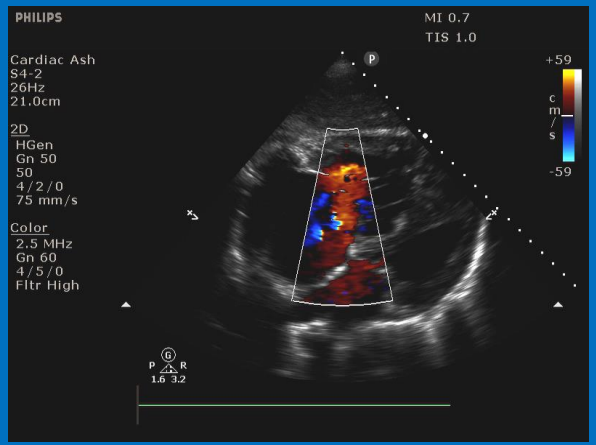
4/2/0
75 mm/s
Color
2.5 MHz
Gn 60
4/5/0
Fltr High
+70
cm/s
-70


PHILIPS
MI 1.3
TIS 0.5
Cardiac Ash
S4-2
27Hz
19.0cm
2D
HGen
Gn 50
50
4/2/0
75 mm/s


PHILIPS
MI 0.7
TIS 1.0
Cardiac Ash
S4-2
26Hz
21.0cm
2D
HGen
Gn 50
50
4/2/0
75 mm/s
Color
2.5 MHz
Gn 60
4/5/0
Fltr High
+59
cm/s
-59

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