



臺北市政府消防局 到院前超音波複訓

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Why
POCUS
?

POCUS for Me



診
斷

Diagnosis

監
測

Monitoring

介
入

Intervention

POCUS

Point-of-Care Ultrasound

“ultrasonography brought to
the patient and performed by
the provider in real time”

Moore, C. L., & Copel, J. A. NEJM 2011



Prehospital US

操作者

EMT-P

超音波

Probe

患者

Patient

Real Time即時救援



到院前超音波

Prehospital ultrasound

要做什麼？

I-AIM掃描目標

Indication (point)適應症



Acquire
擷取影像



Interpret
判讀影像



Make decision
決定治療方向

Shock摸不到脈搏

PEA心臟有在跳嗎？



Acquire
心臟介面



Interpret
搏動有無



Make decision
急救流程



到院前超音波

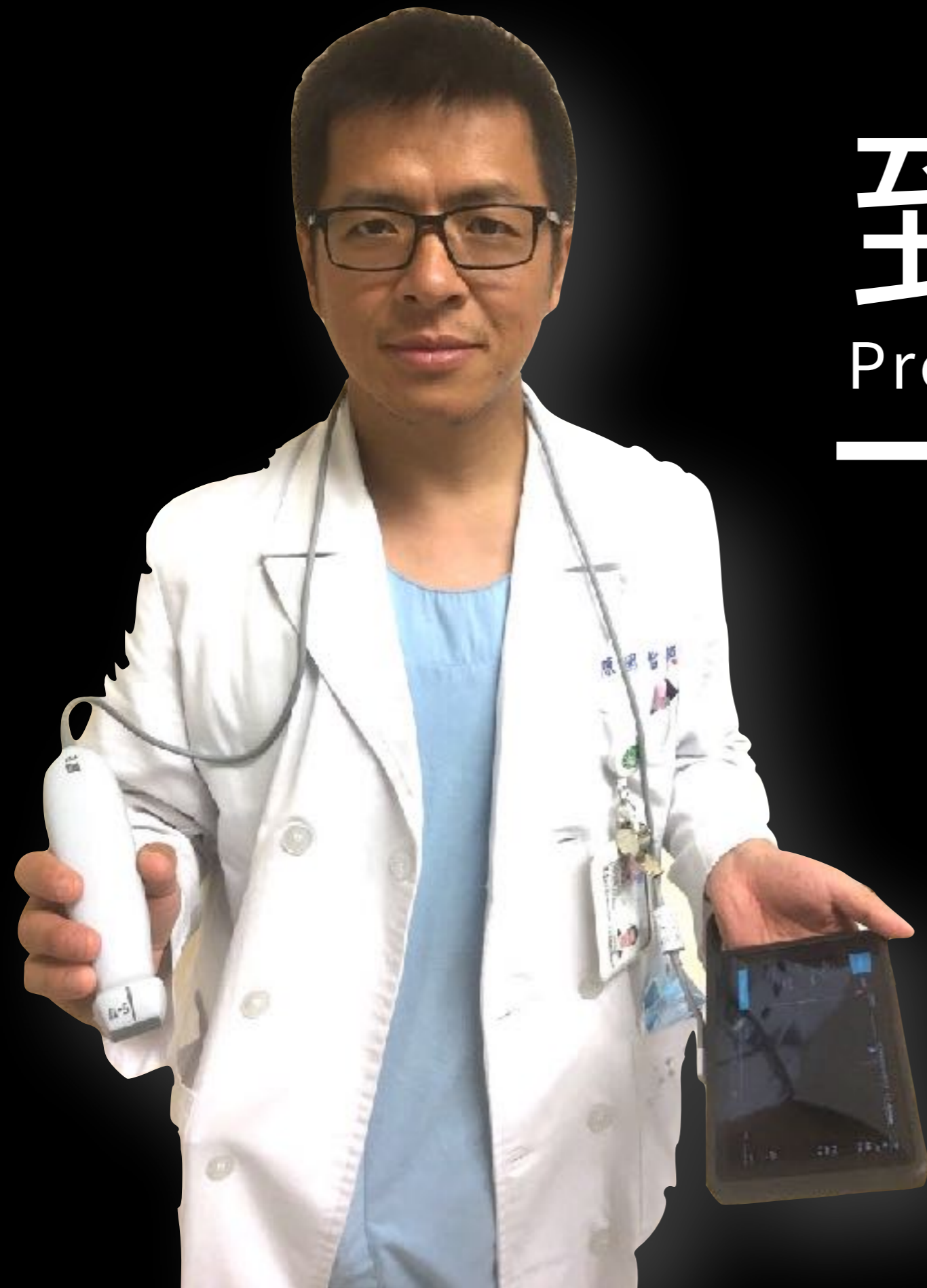
Prehospital ultrasound

氣 (A) Airway

胸 (B) Breathing

心 (C) Circulation

血 (D) Diaphragm



到院前超音波

Prehospital ultrasound

氣 (A) 插管一根管

胸 (B) 滑動與氣胸

心 (C) 心搏與積液

血 (D) 肋膜與血胸

影像優化3大重點

置中

對焦

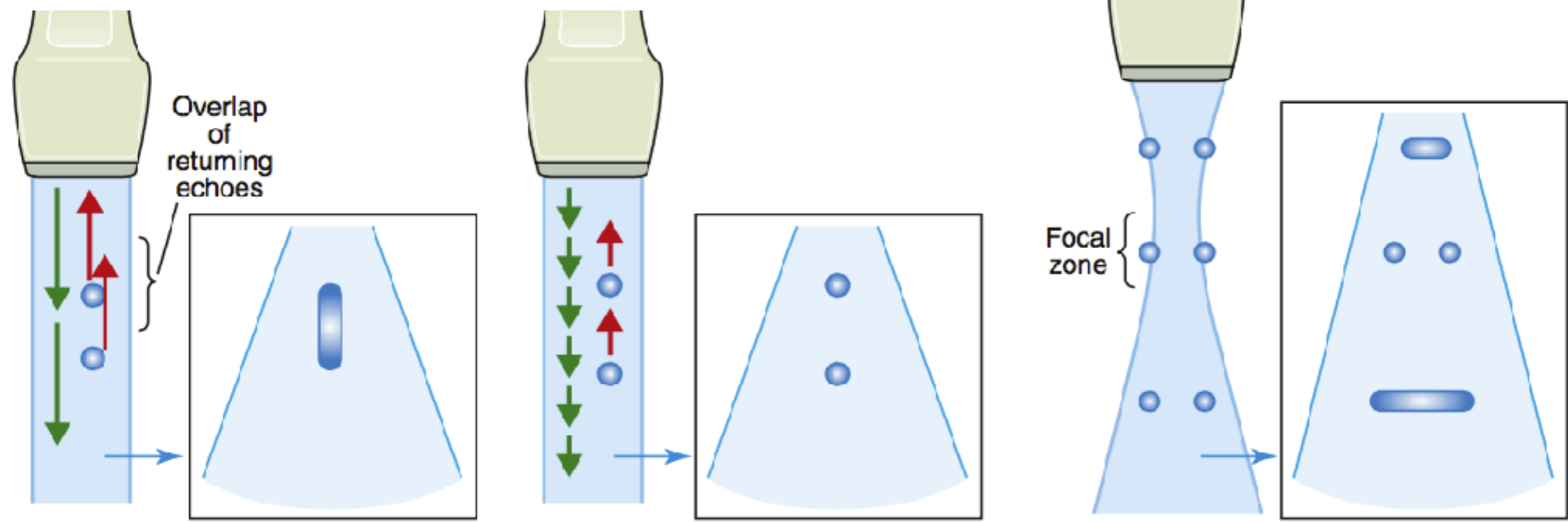
高頻

Axial resolution

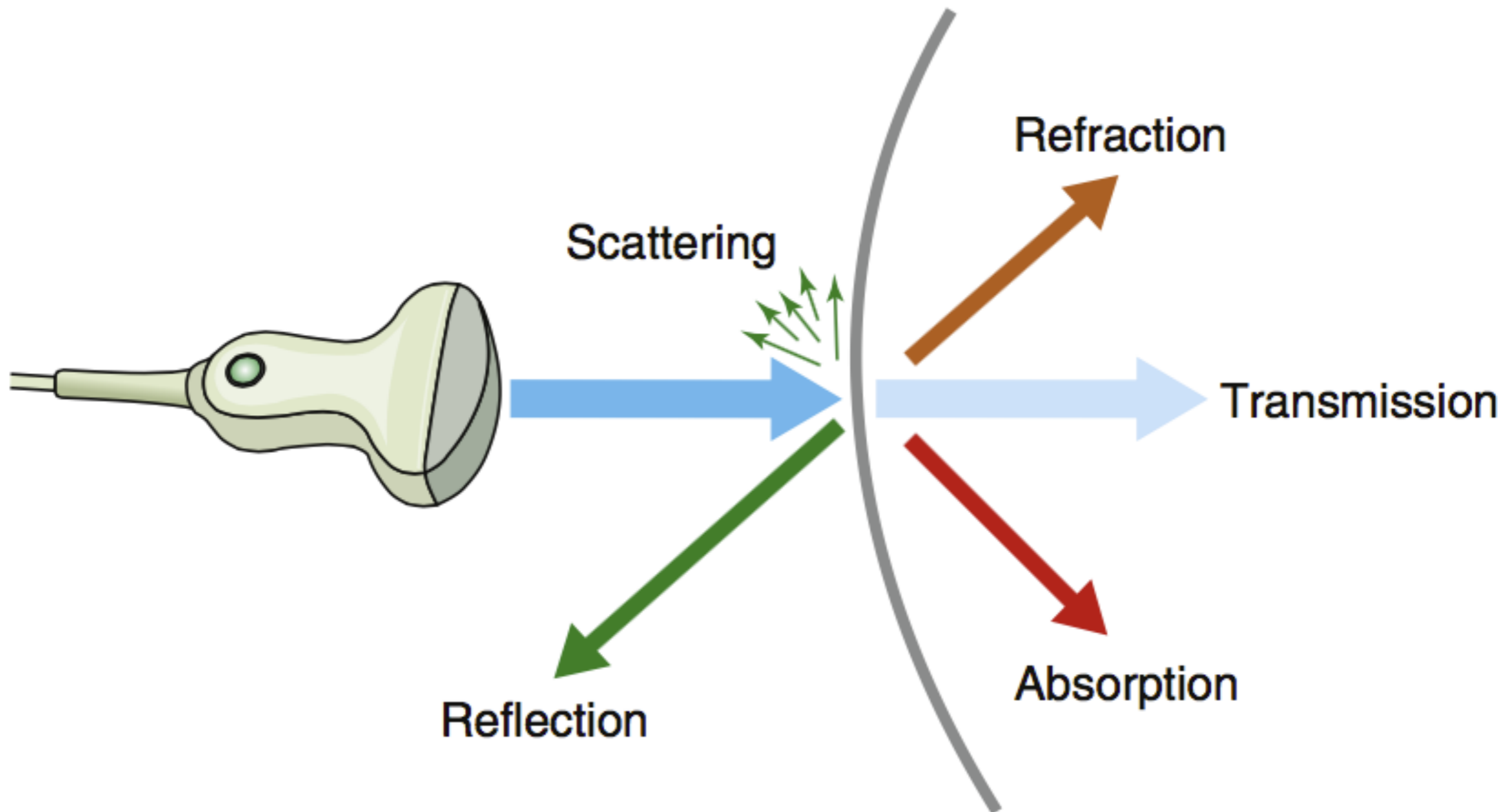
Lateral resolution

Lower frequency

Higher frequency



如何對抗這些【敵人】？





Depth

Gain

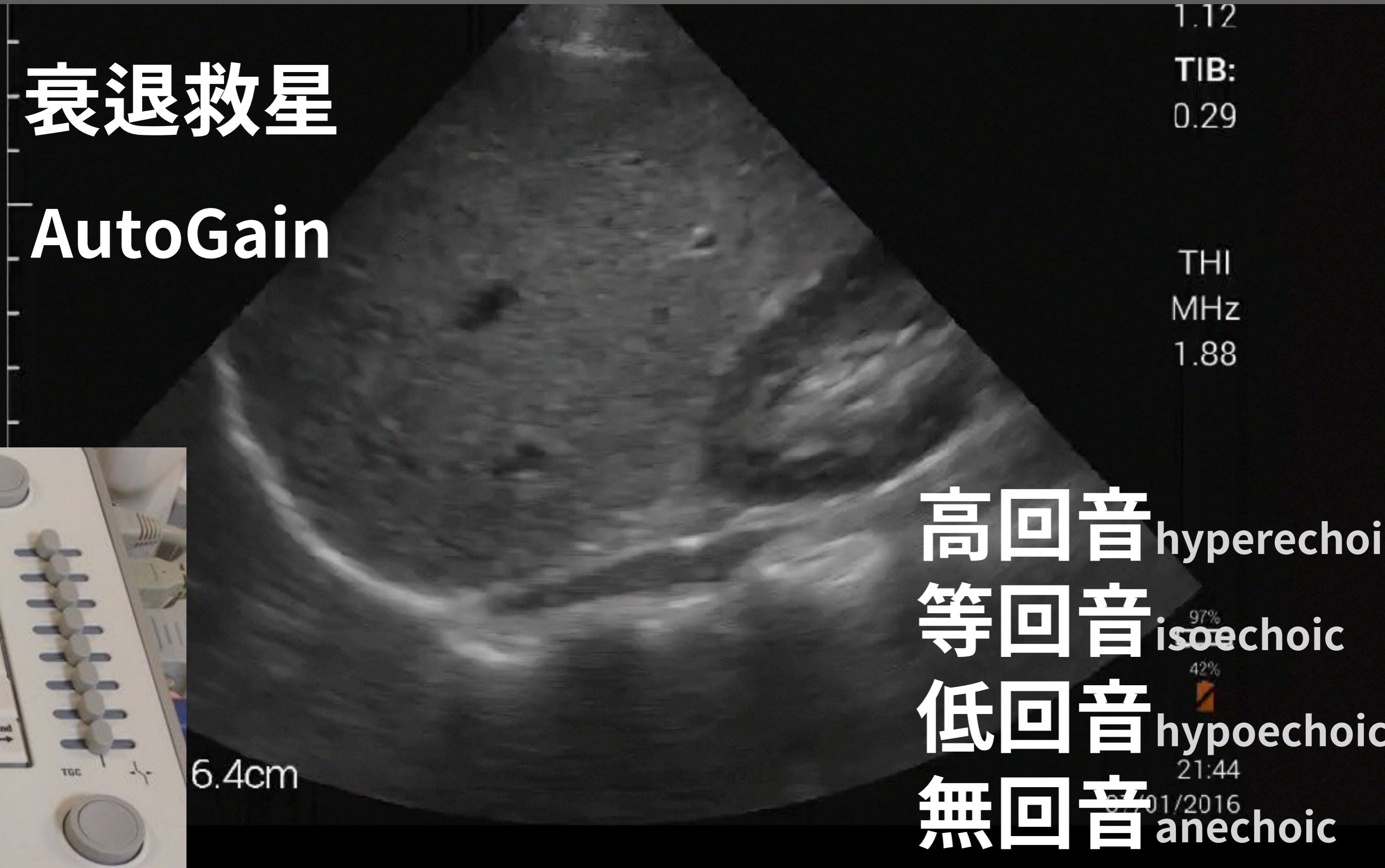
Capture

Record

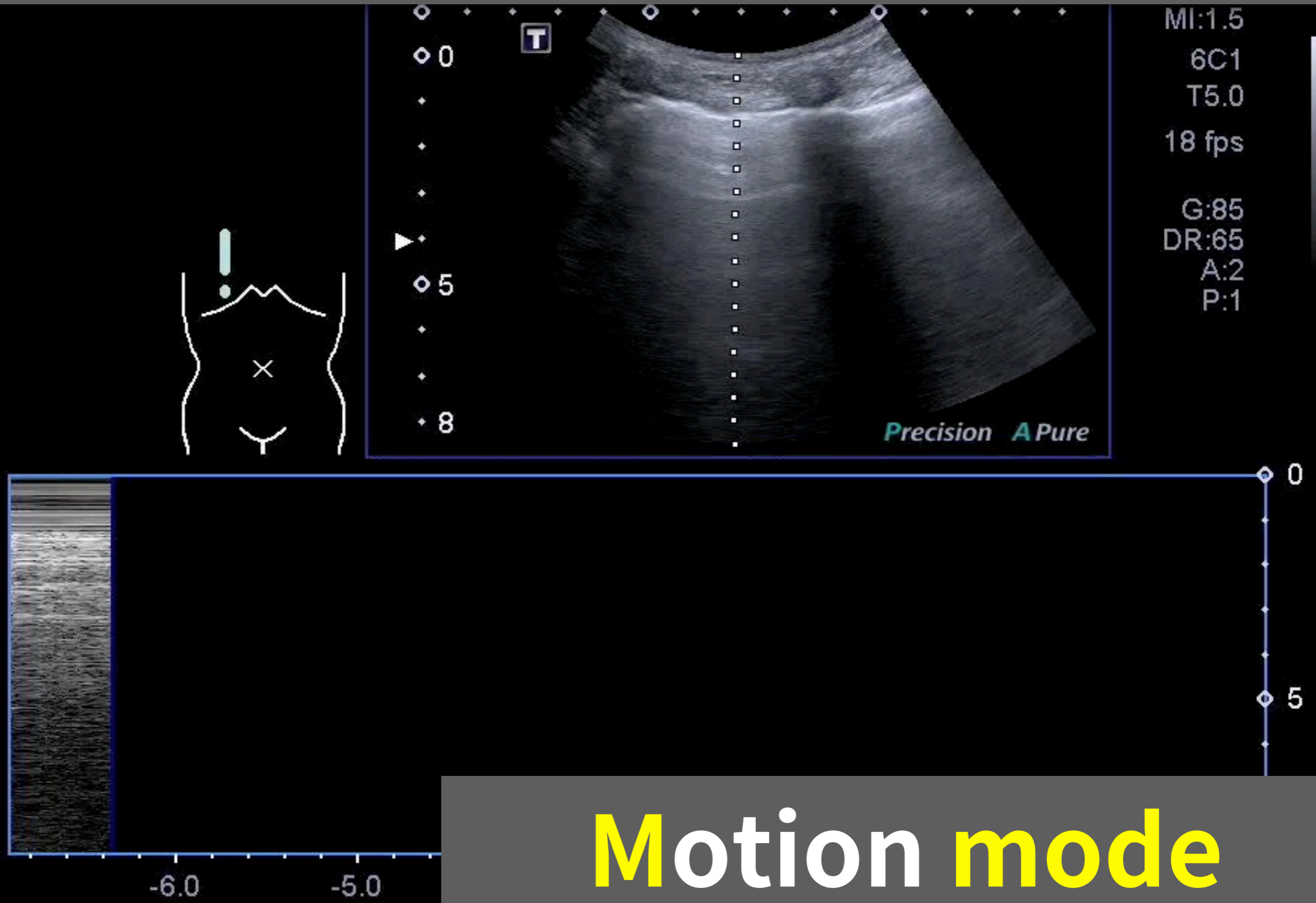
Time Gain Compensation

衰退救星

AutoGain



To record **Motion**

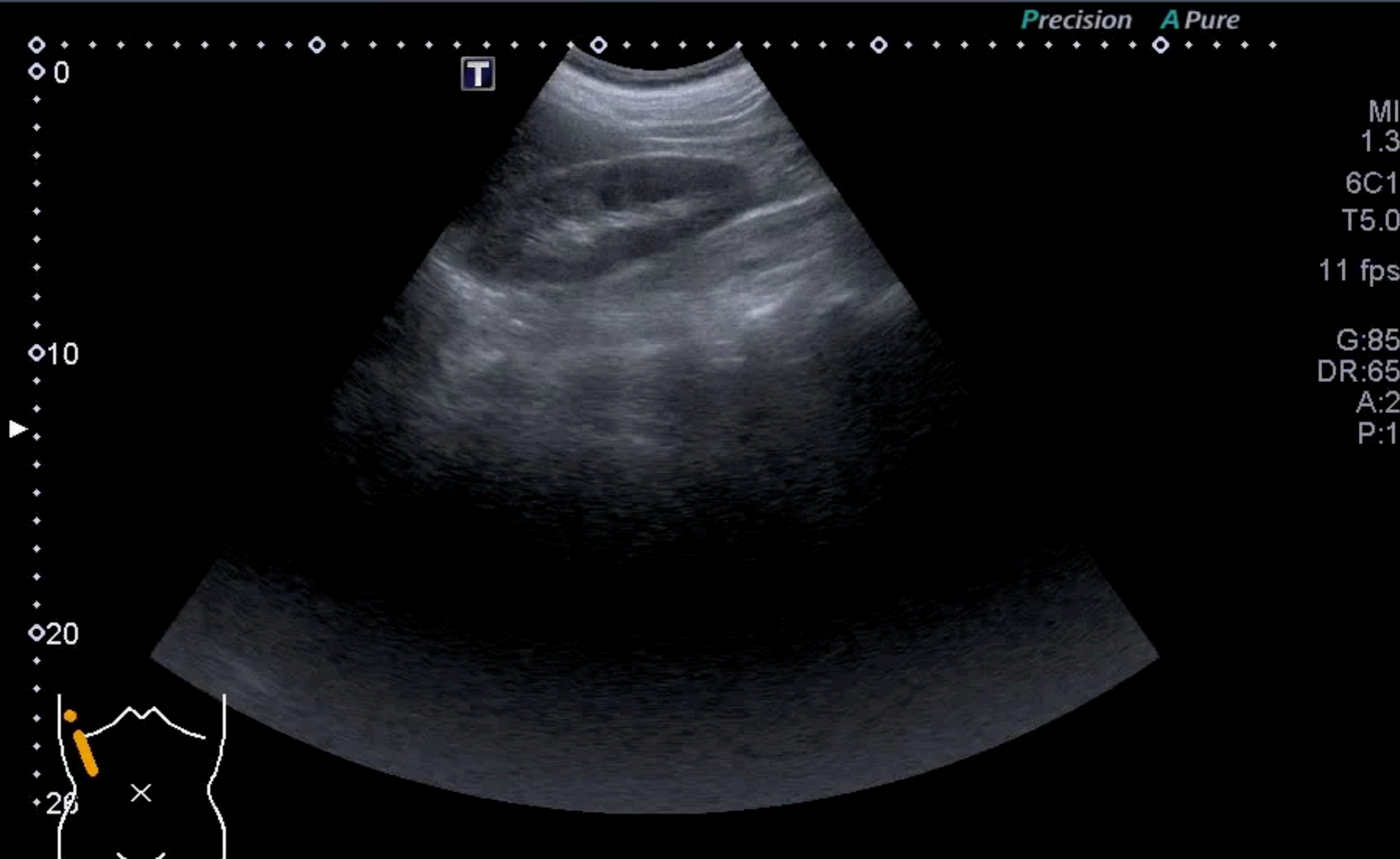


Motion mode

如何改善影像品質？



如何改善影像品質？



影片中做了什麼調整？



POCUS三劍客



弧

表面

目標



線

頻率

介面



扇

深度

視窗

到院前超音波的探頭



表面

頻率

深度

目標

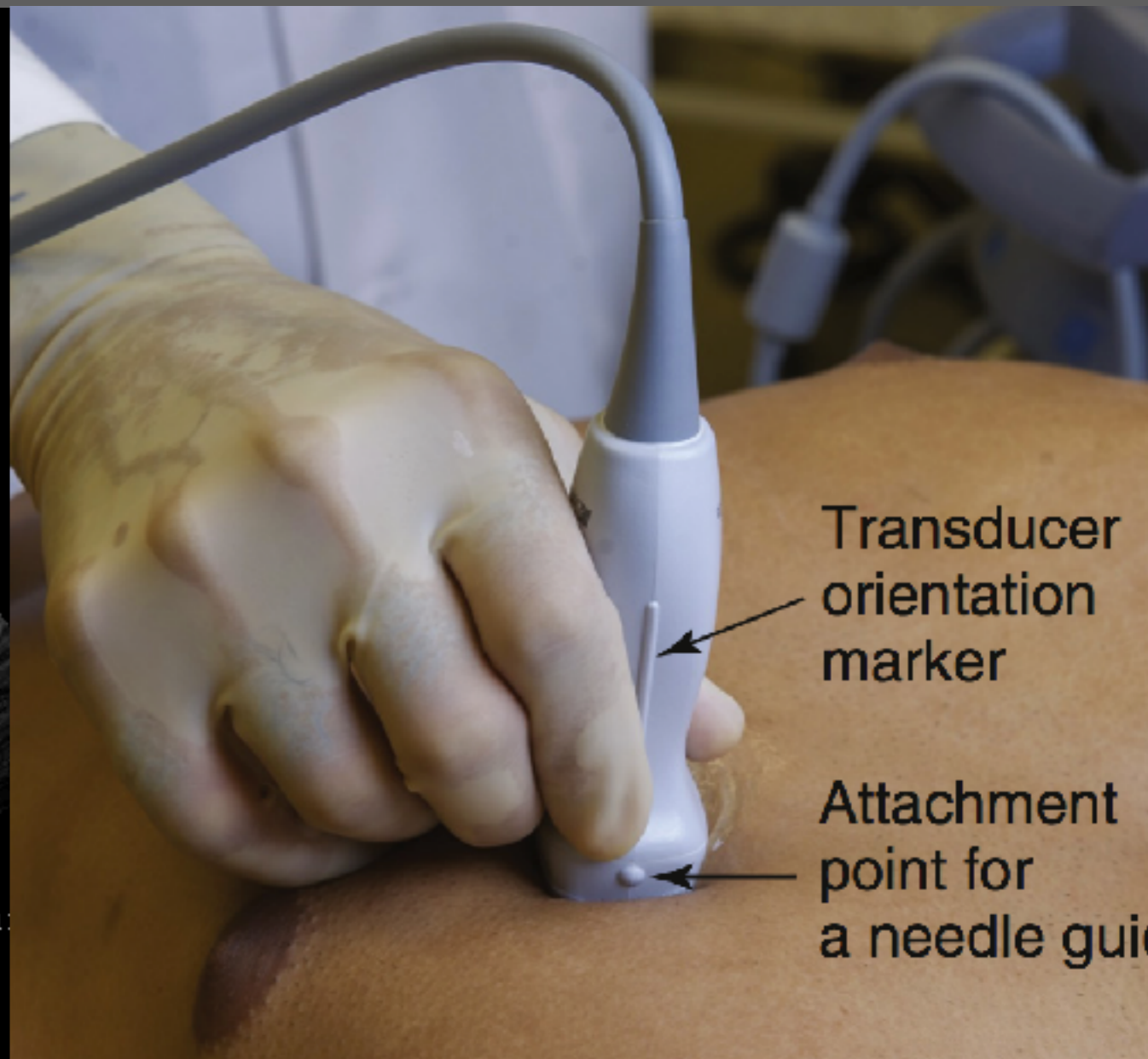
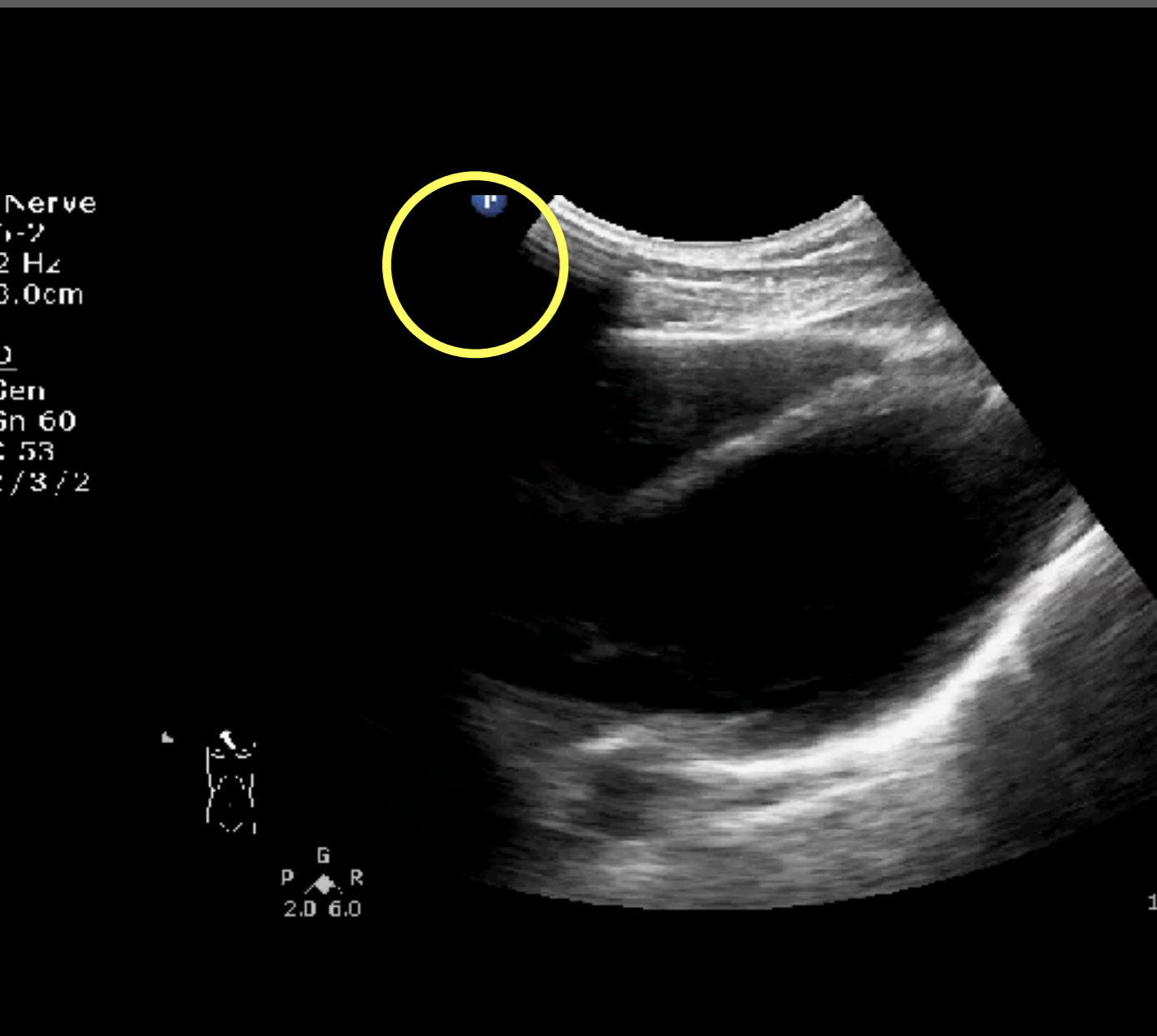
介面

視窗

一次
一動

愈慢
愈快

方向：患者的右側和頭側



WHEEL OFF ●

WHEEL ON ●

STOP ●

WHEEL OFF ●

WHEEL ON ●



● WHEEL OFF

● WHEEL ON

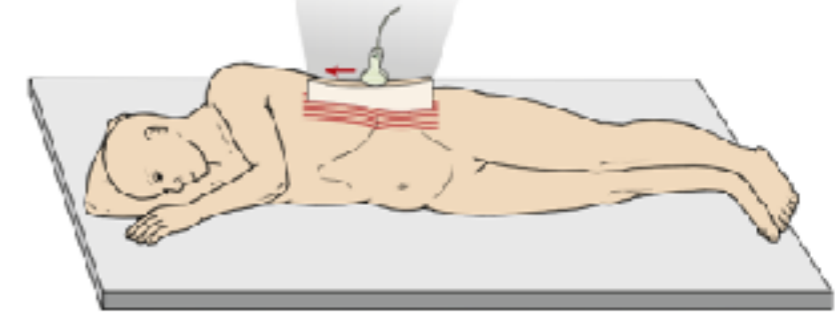
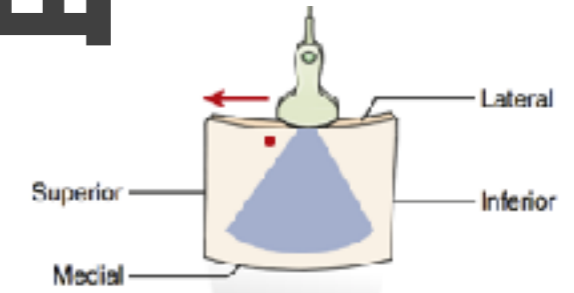
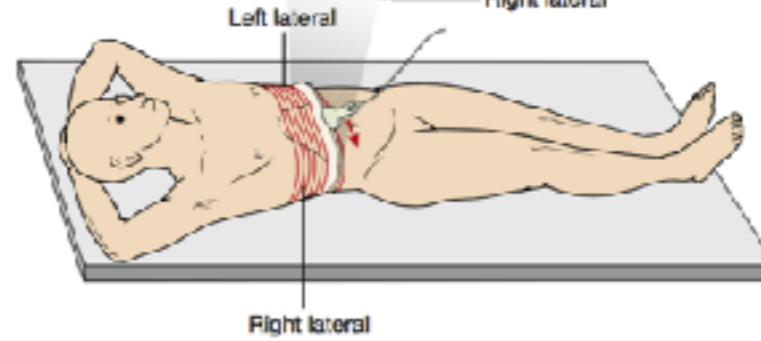
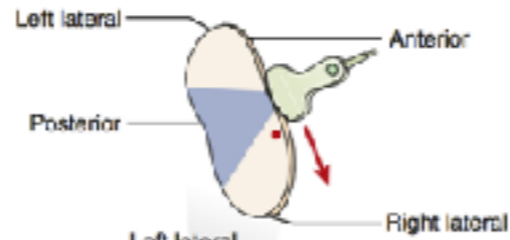
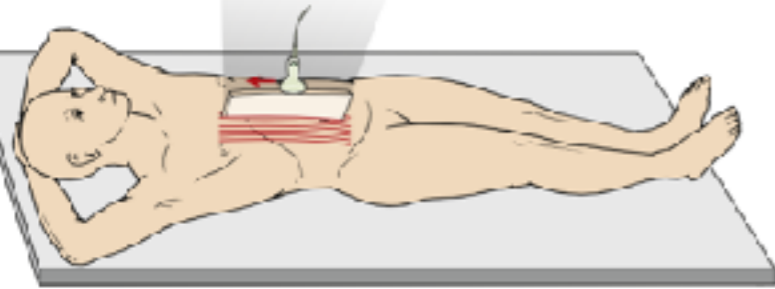
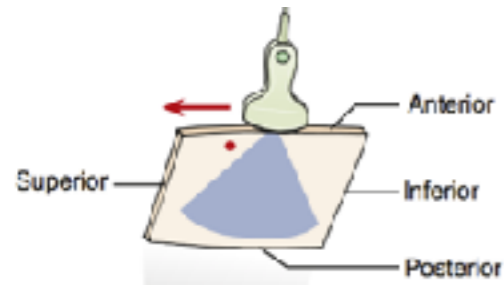
● GO

● WHEEL OFF

● WHEEL ON



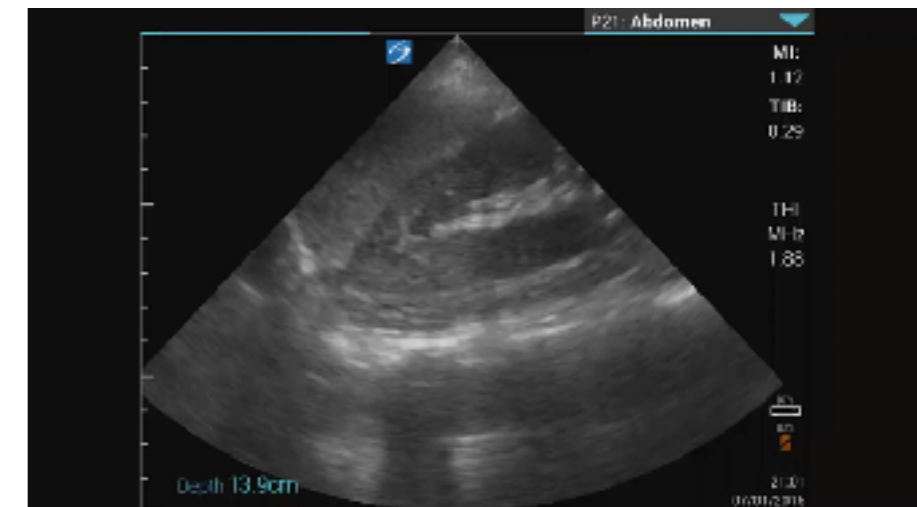
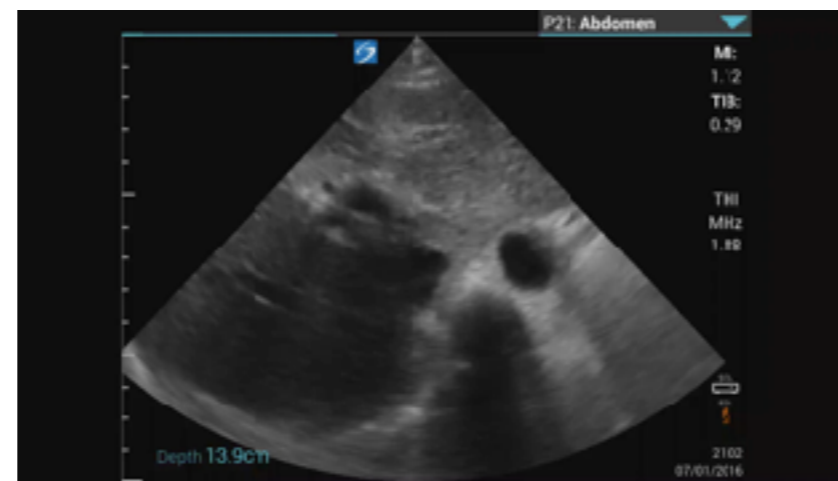
超音波掃描介面



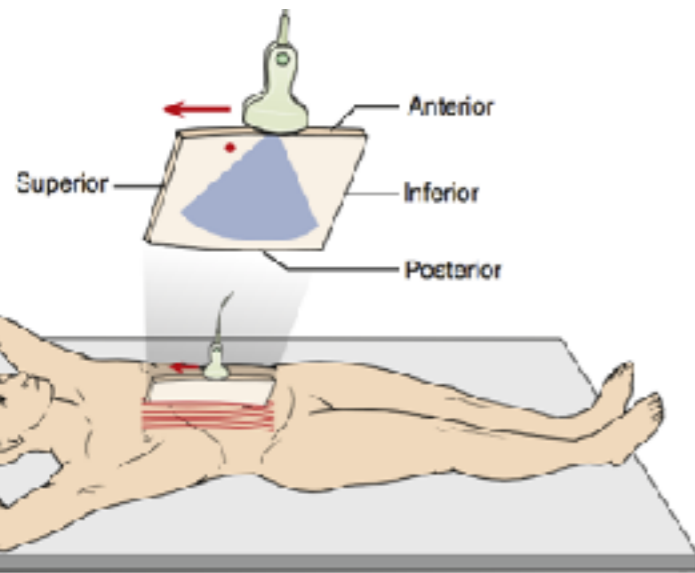
Sagittal 縱

Transverse 橫

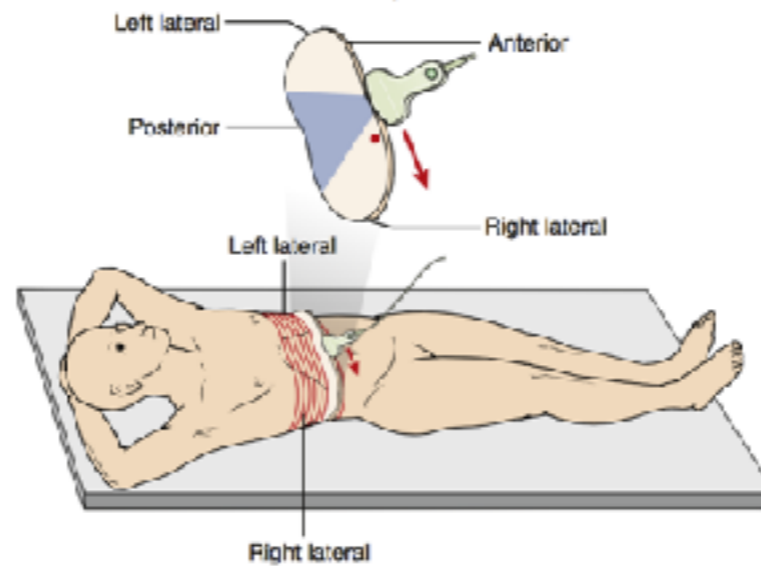
Coronal 側



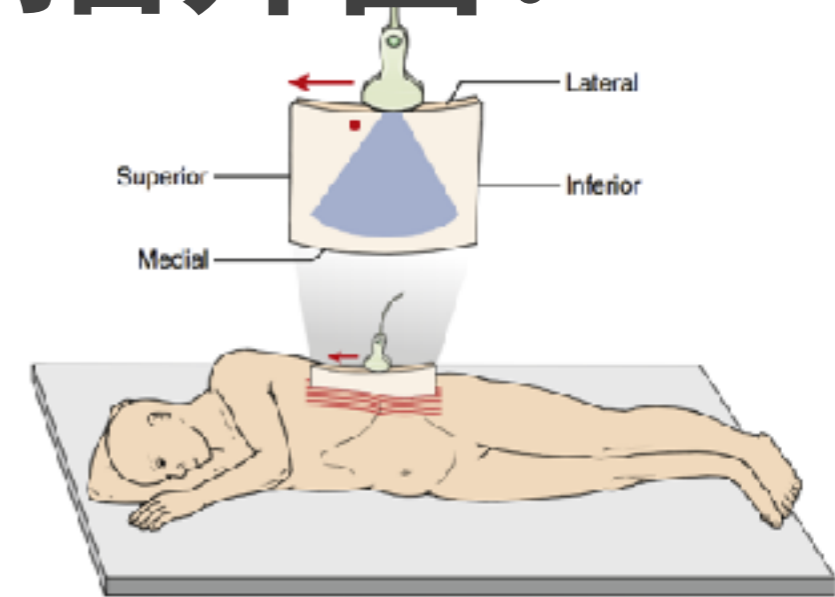
如何選擇ABCD最佳掃描介面？



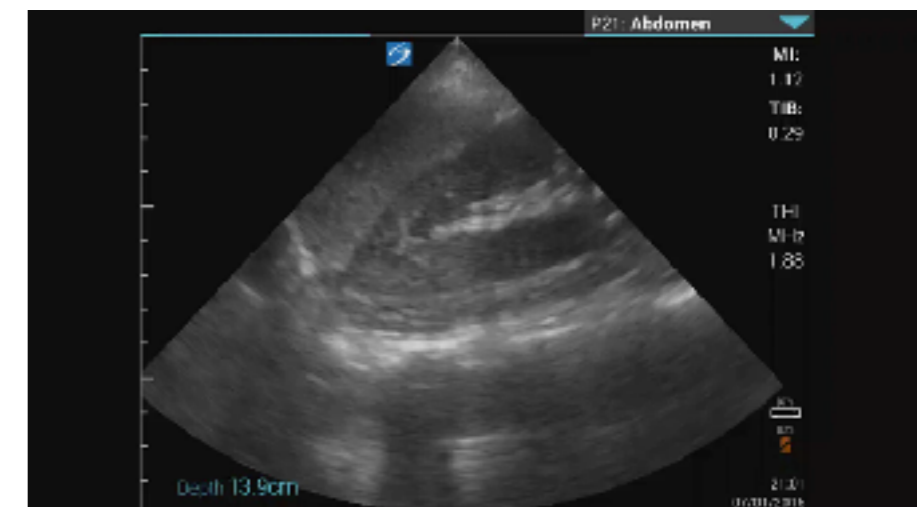
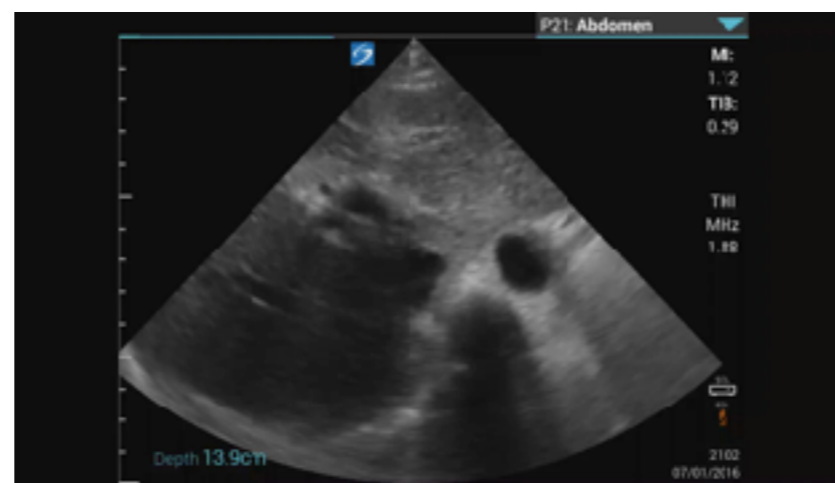
Sagittal 縱



Transverse 橫



Coronal 側





到院前超音波

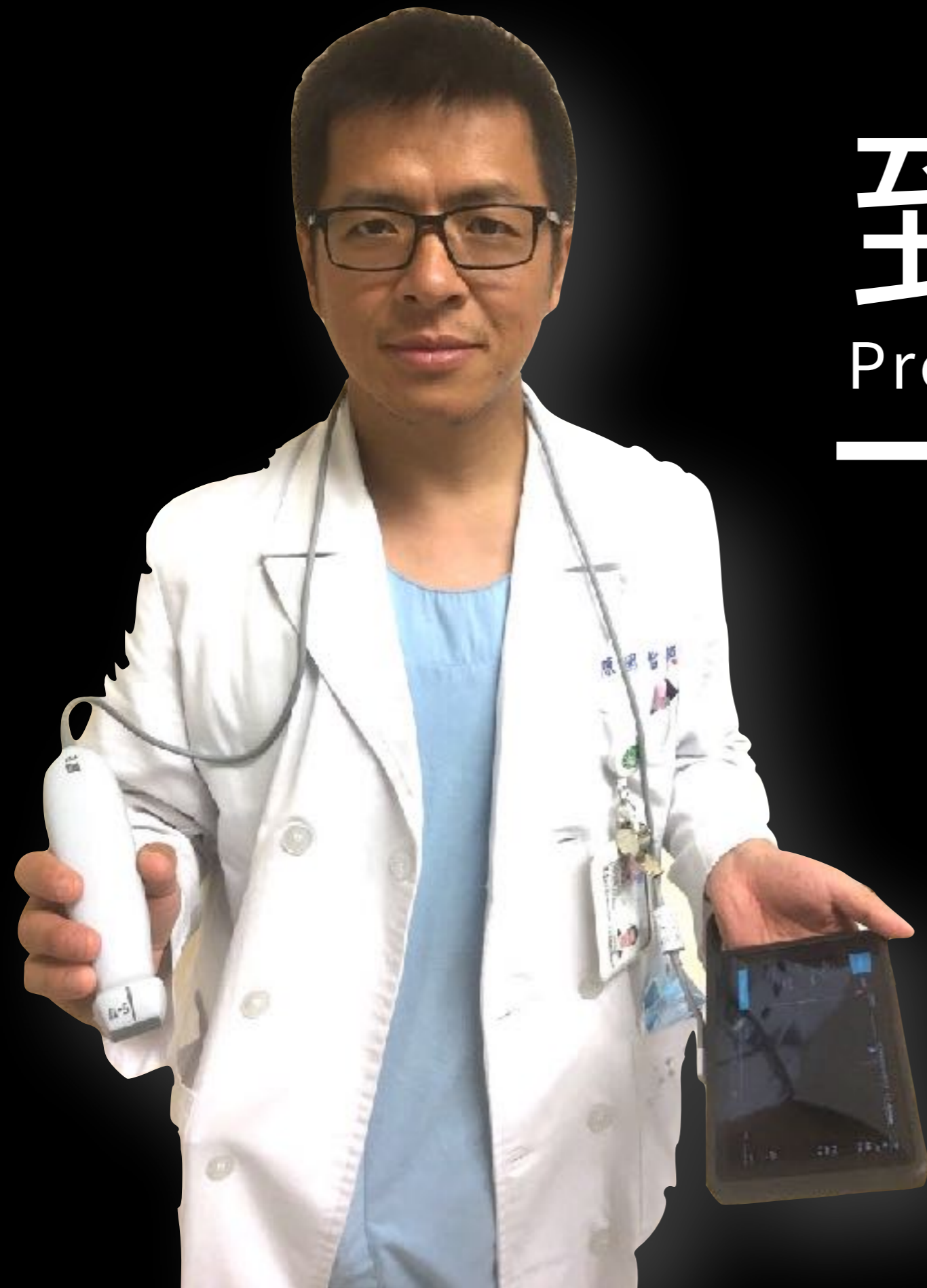
Prehospital ultrasound

氣 (A) Airway

胸 (B) Breathing

心 (C) Circulation

血 (D) Diaphragm



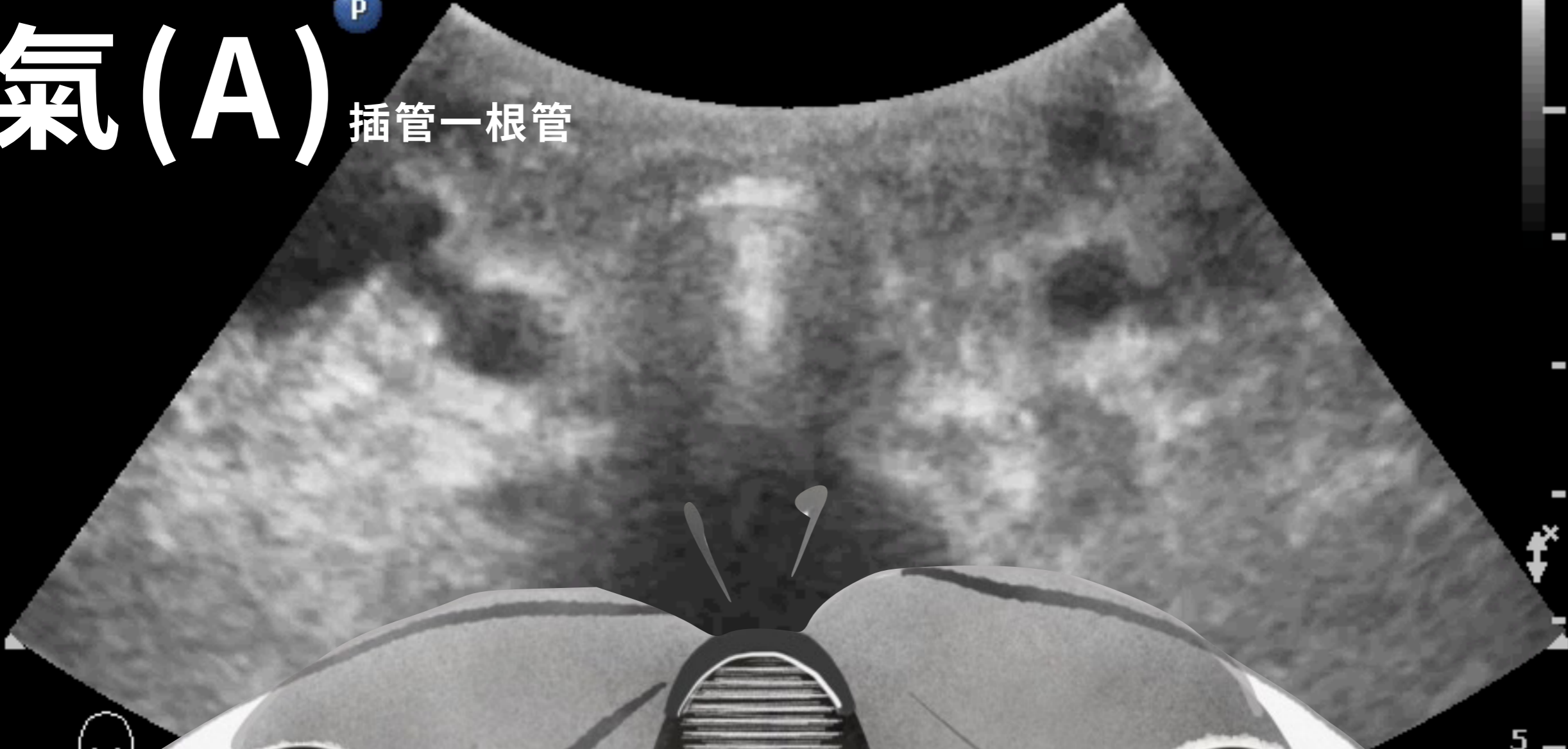
到院前超音波

Prehospital ultrasound

- 氣 (A) 插管一根管
- 胸 (B) 滑動與氣胸
- 心 (C) 心搏與積液
- 血 (D) 肋膜與血胸

氣(A)

插管一根管



P
1.8 3.6

5
6.0cm

One Tract

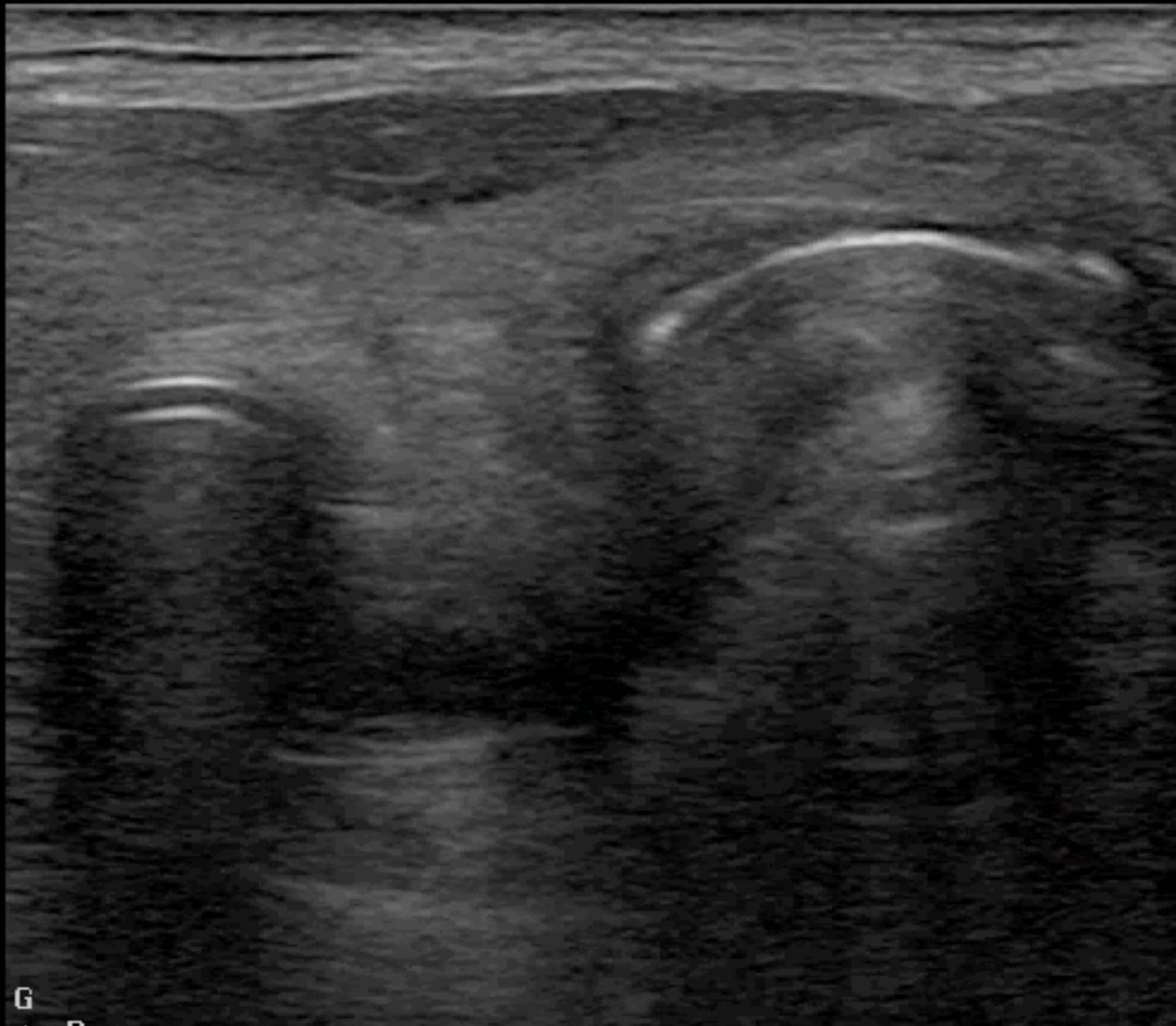


氣 (A) 插管一根管

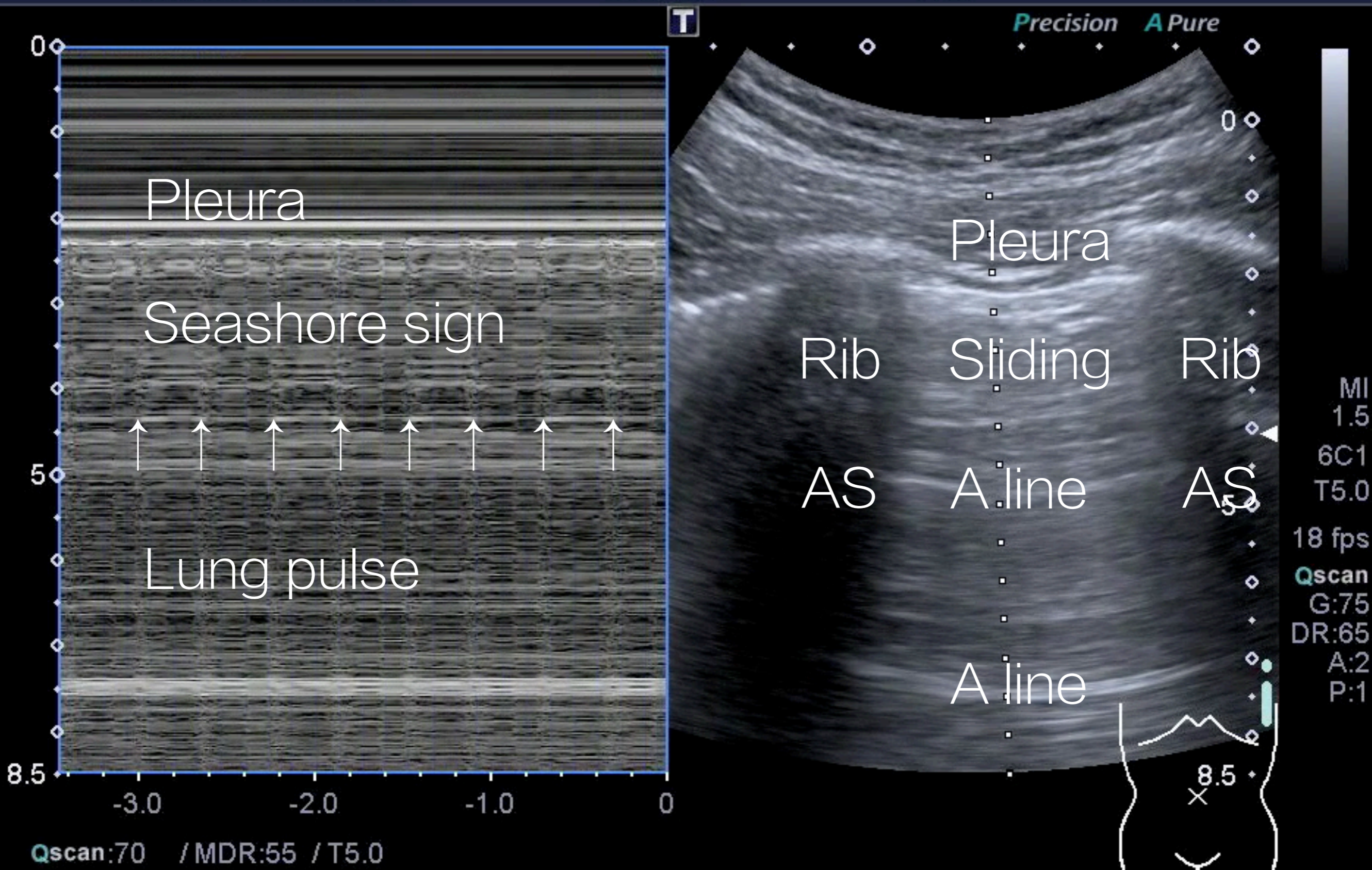
幾個氣柱 (Air tract) ?

Superficial
L12-3
46 Hz
3.5cm

2D
Res
Gn 60
C 56
3 / 2 / 1

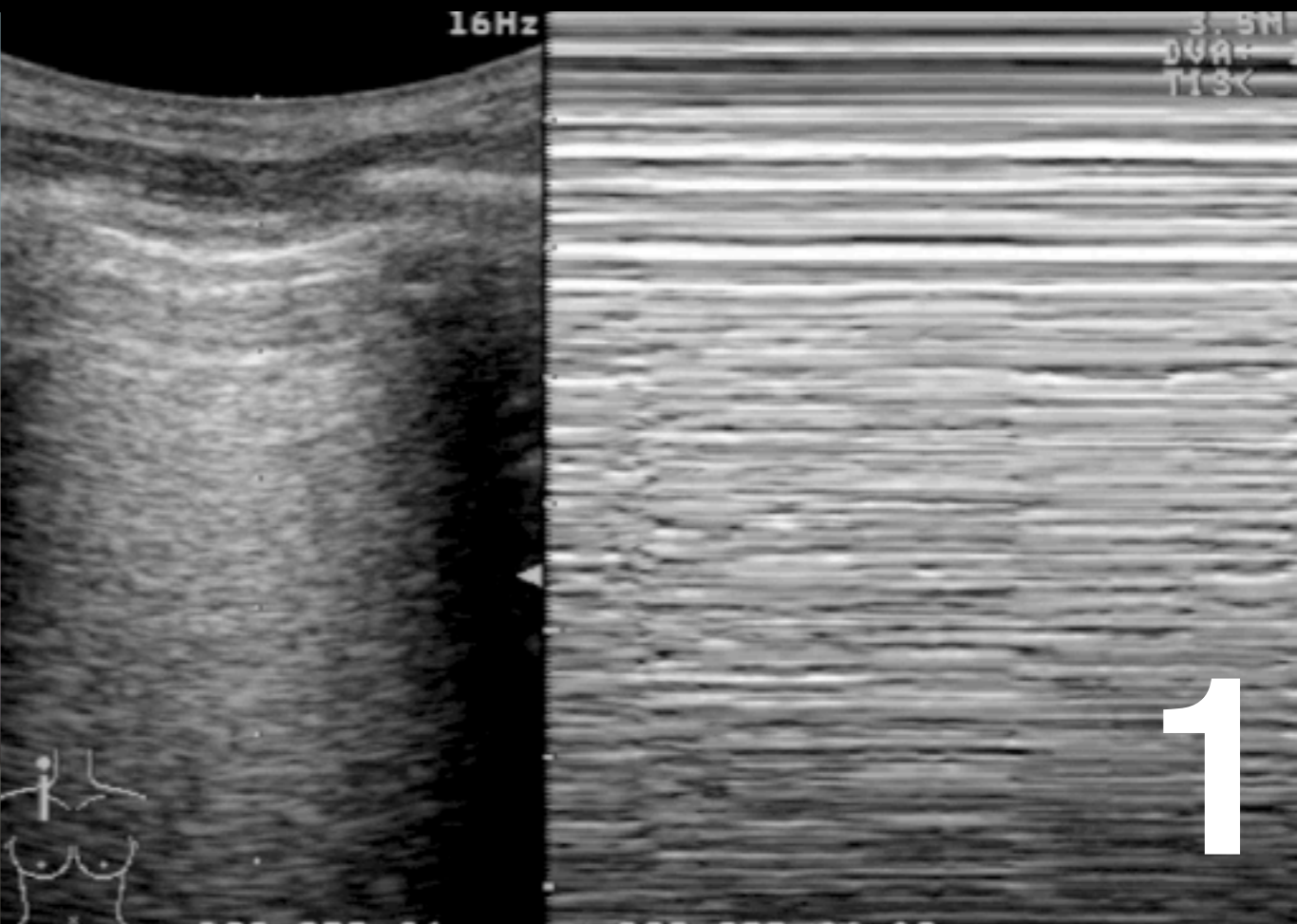


正常肺部的動與靜

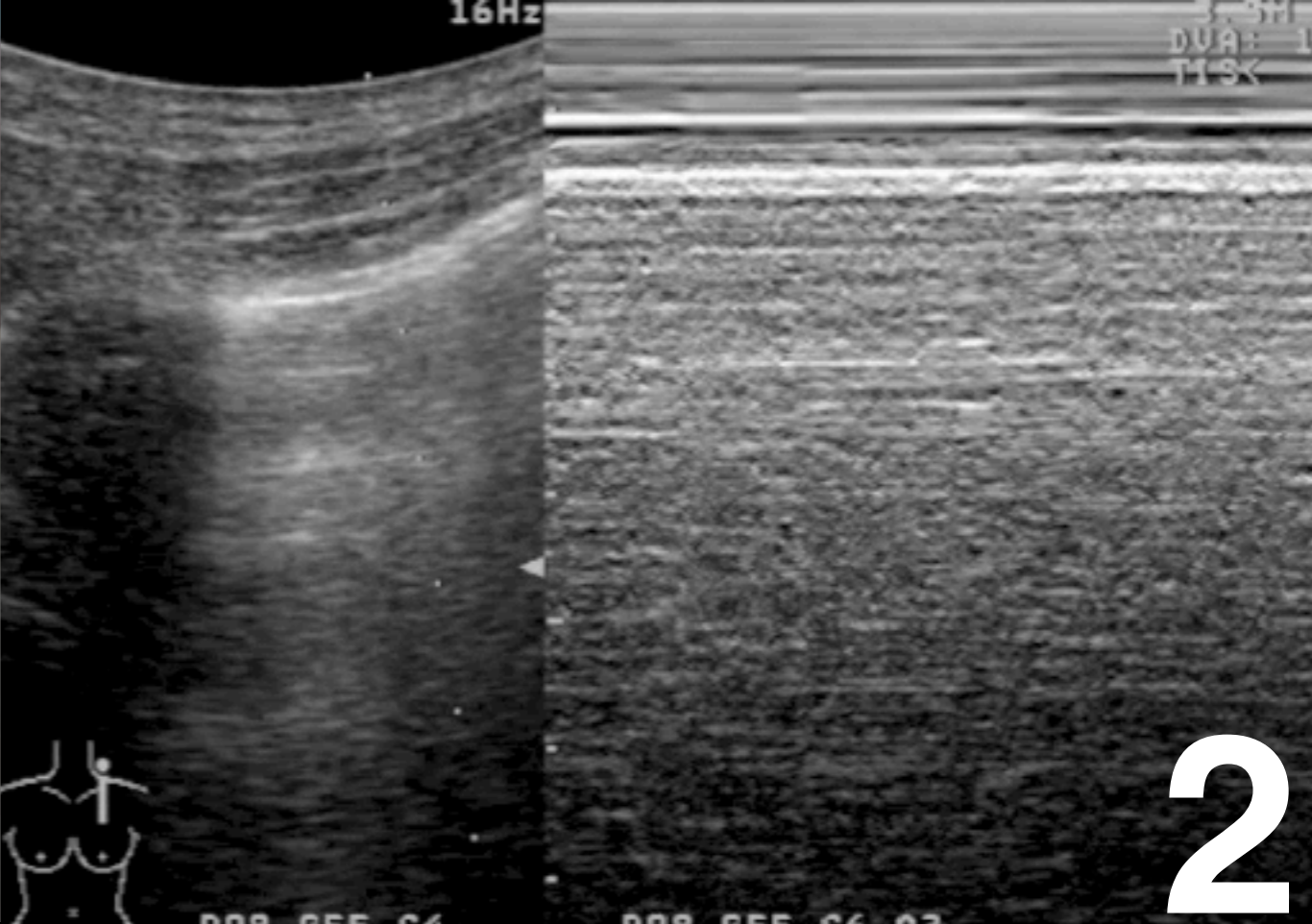


胸(B)

滑動與氣胸



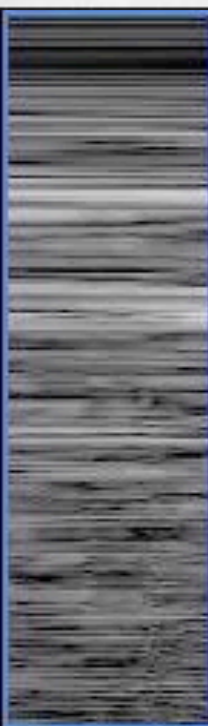
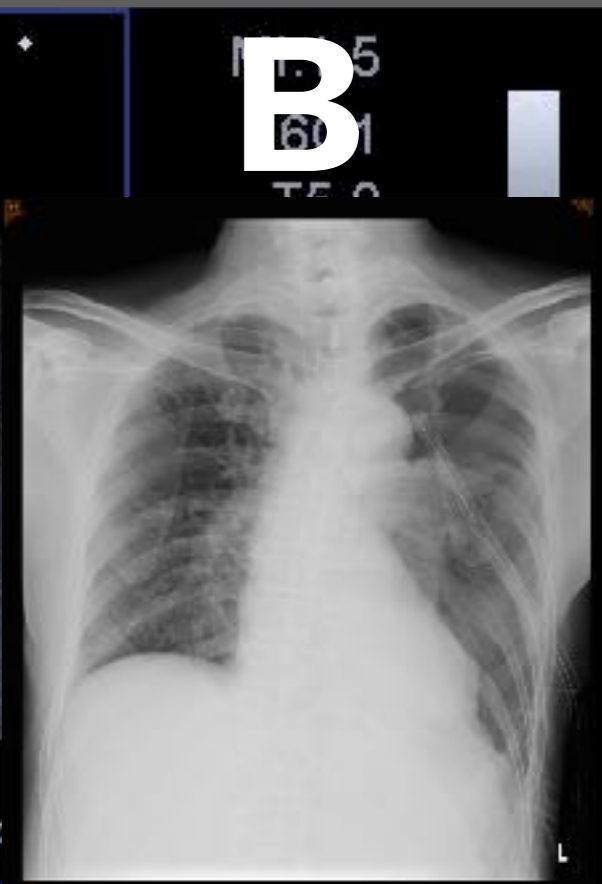
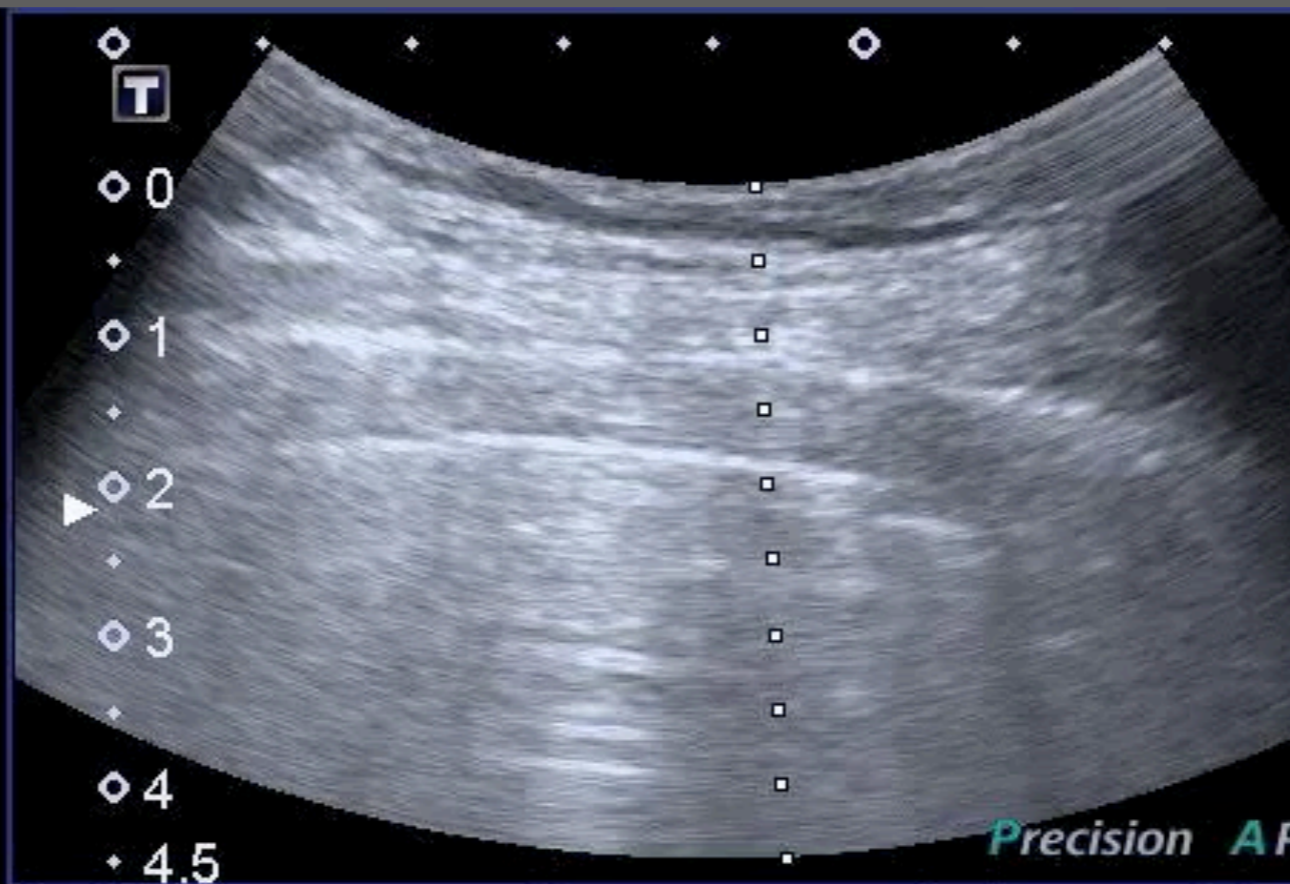
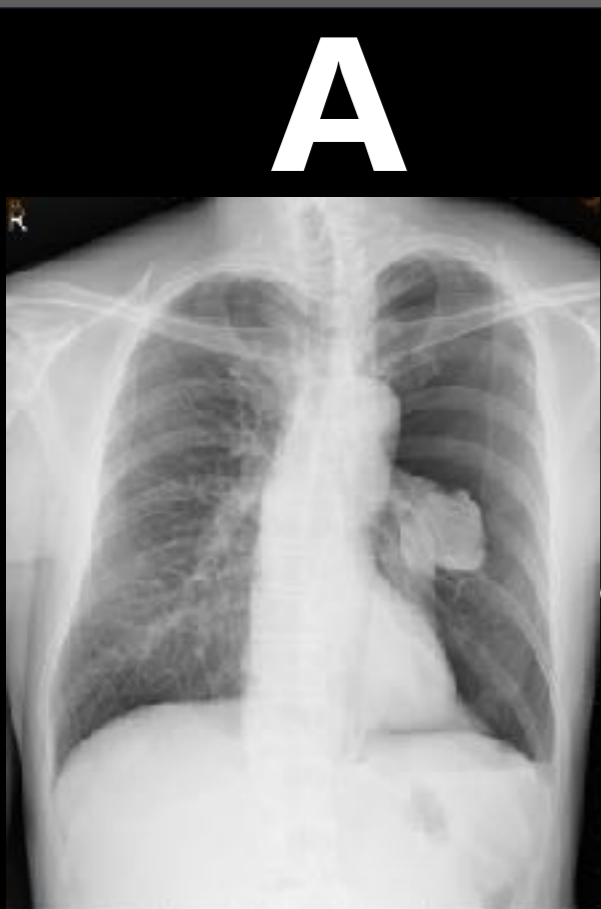
1



2

胸(B) 滑動與氣胸

Lung point



心(C) 心搏與積液



FAST
C5-1
26 Hz
22.0cm

2D
Gen
Gn 76
C 56
1 / 3 / 3



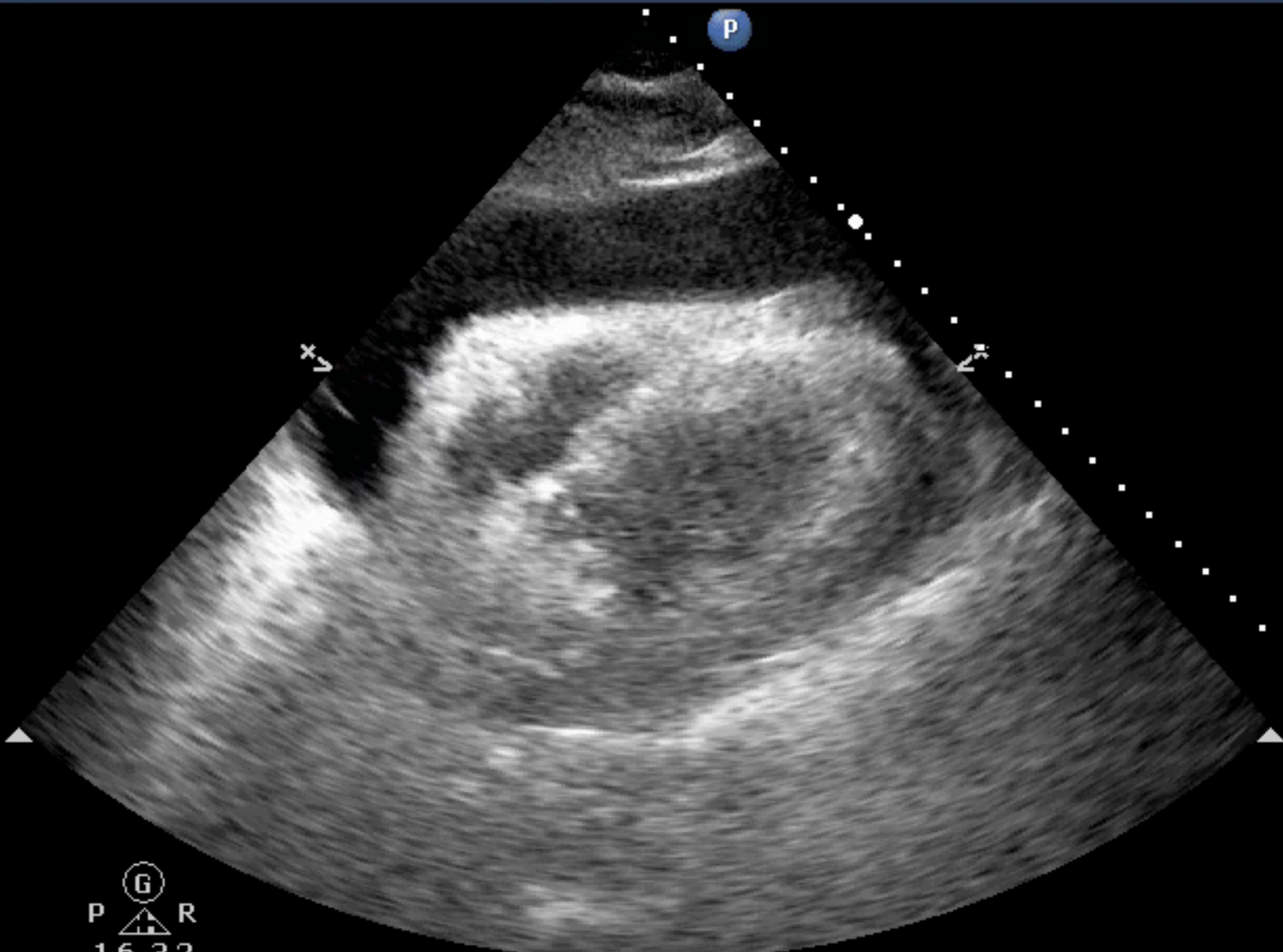
心(C) 心搏與積液

有心包膜積液嗎？

Adult Echo2
S5-1
24 Hz
24.0cm

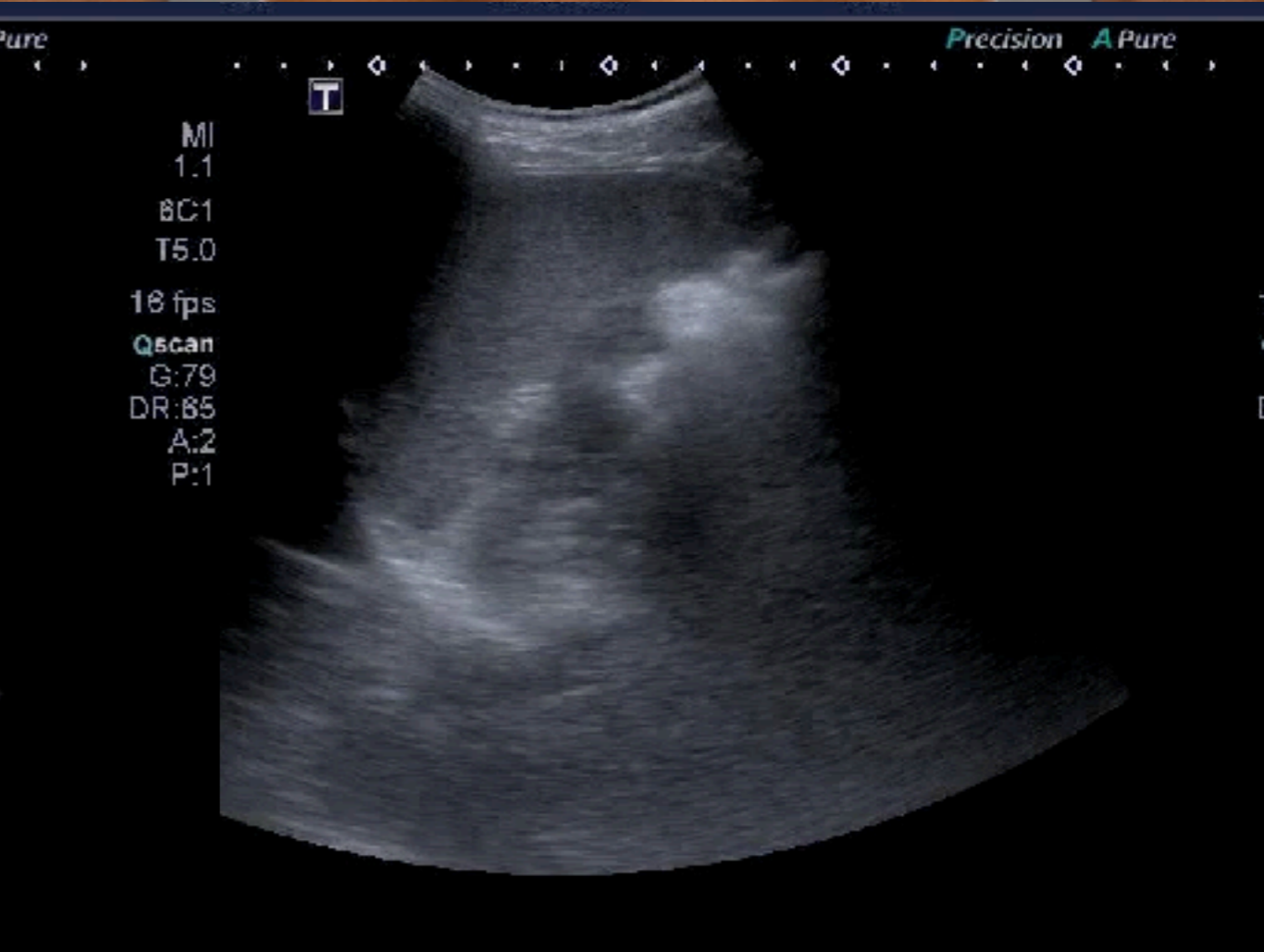
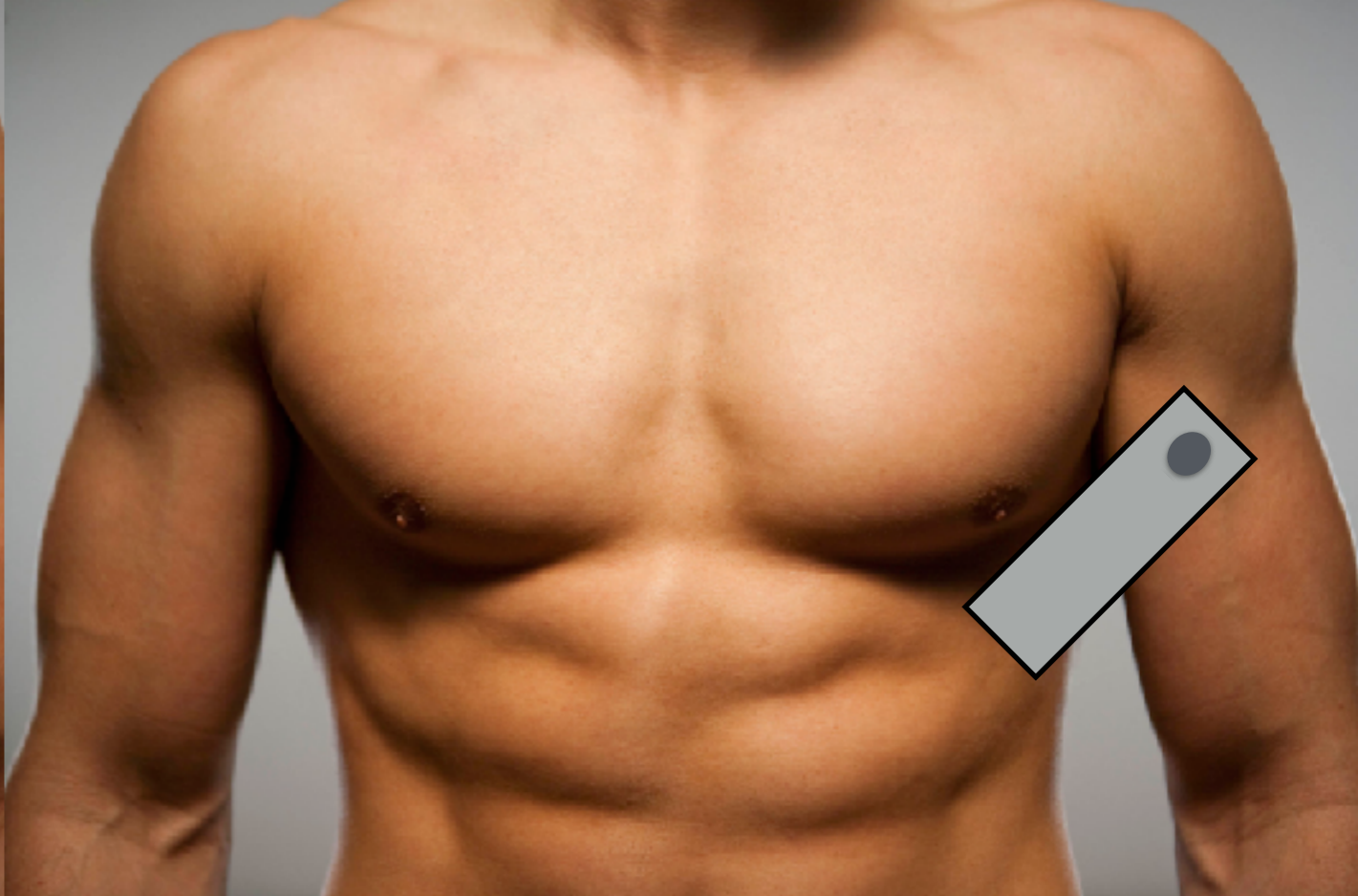
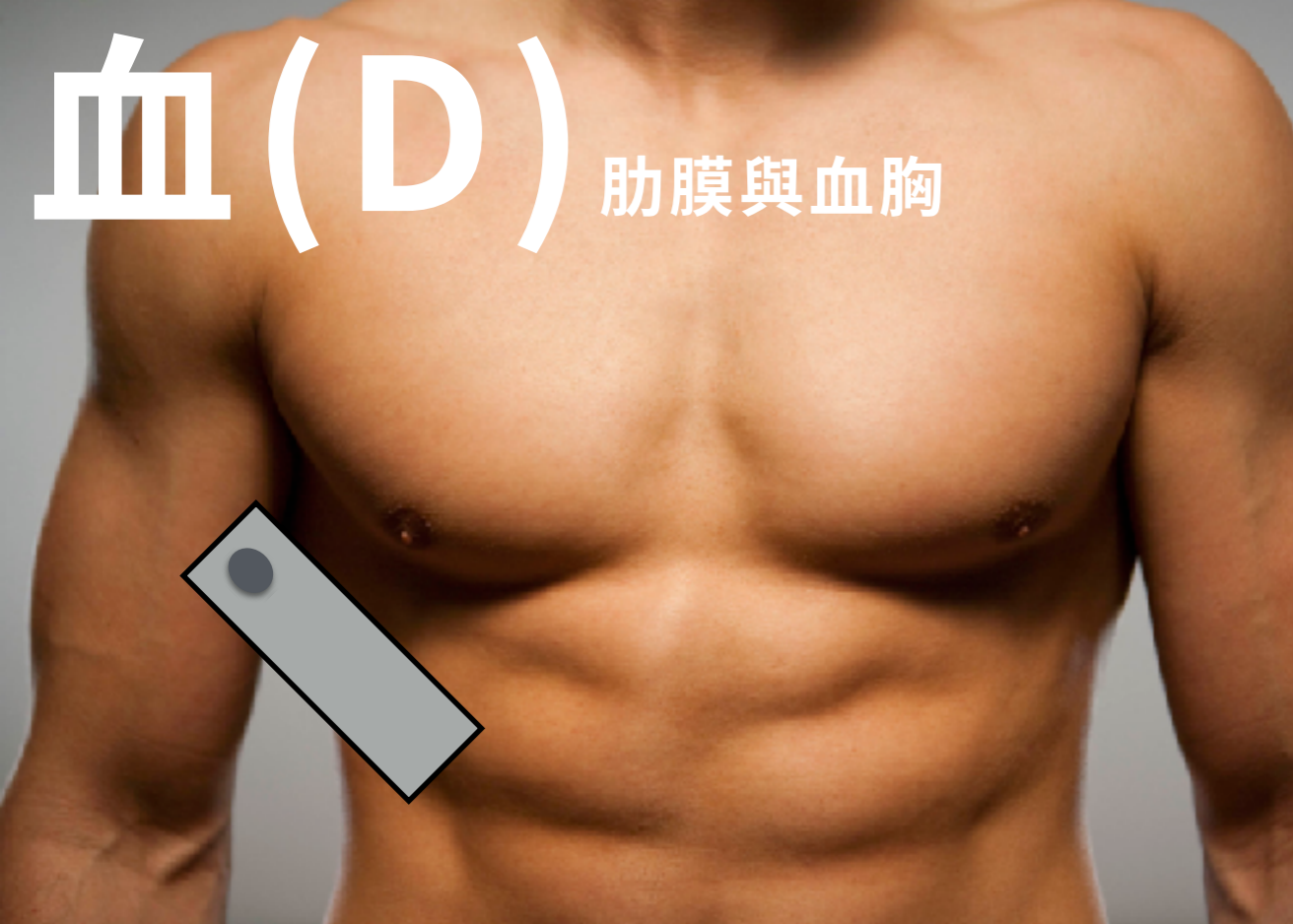
2D

HGen
Gn 50
C 50
3/2/0



G
P R
1 6 2 2

血 (D) 肋膜與血胸

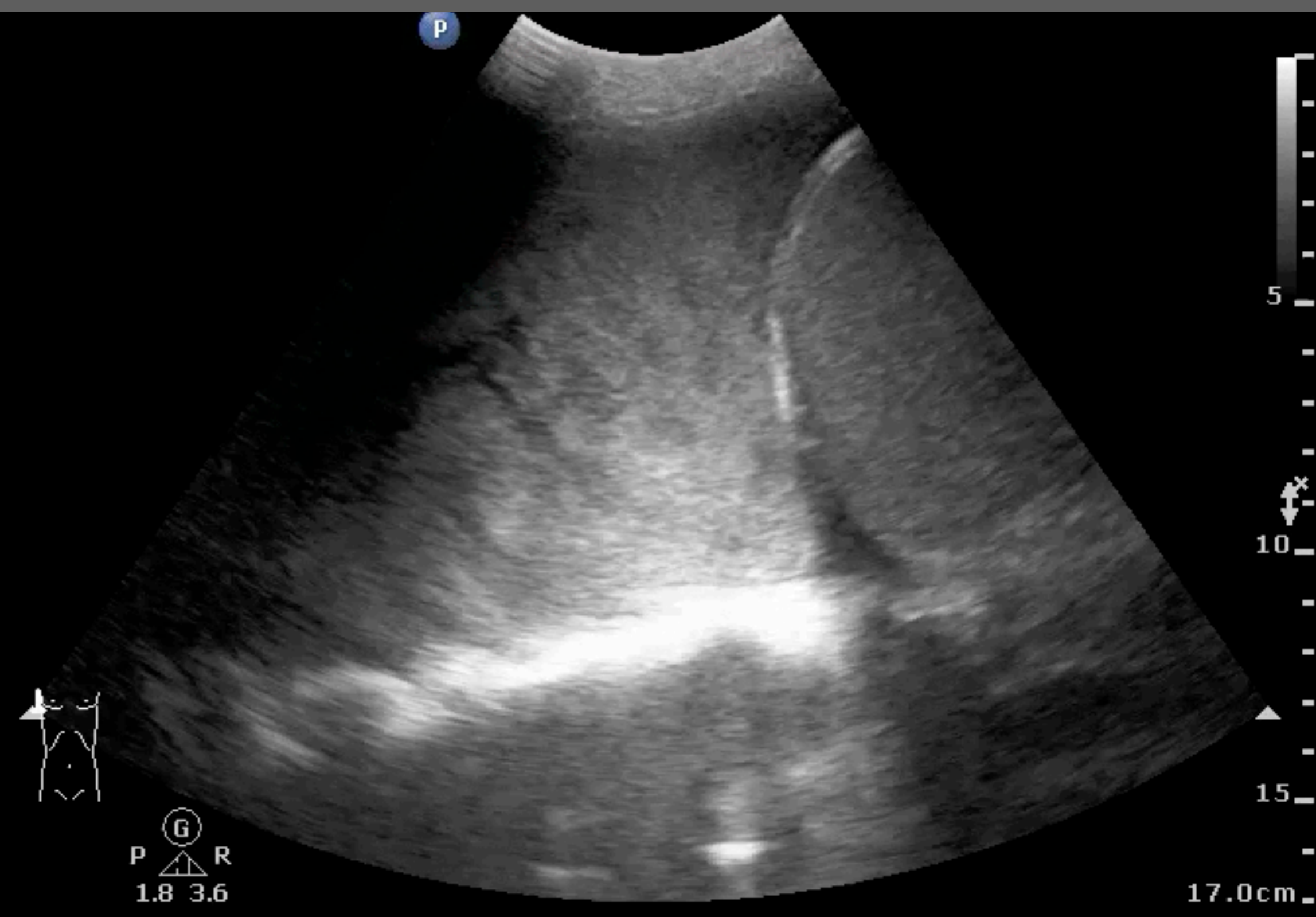


血(D) 肋膜與血胸

有大量血胸嗎？

Abd Gen
C5-1
31 Hz
17.0cm

2D
HGen
Gn 90
C 56
3/3/3



到院前超音波

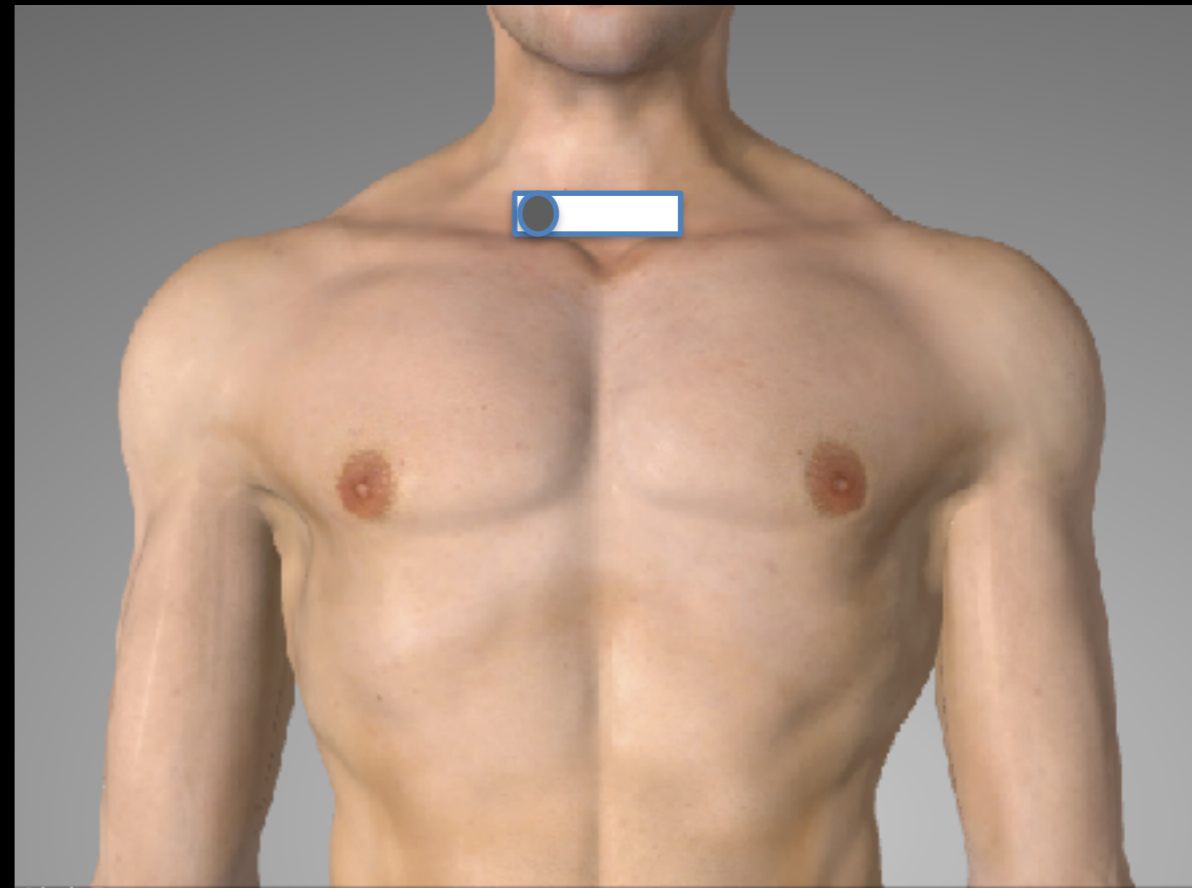
Prehospital ultrasound

氣 (A) Airway / 插管一根管

胸 (B) Breathing / 滑動與氣胸

心 (C) Circulation / 心搏與積液

血 (D) Diaphragm / 肋膜與血胸



Abd Gen
C5-1
58 Hz
6.0cm

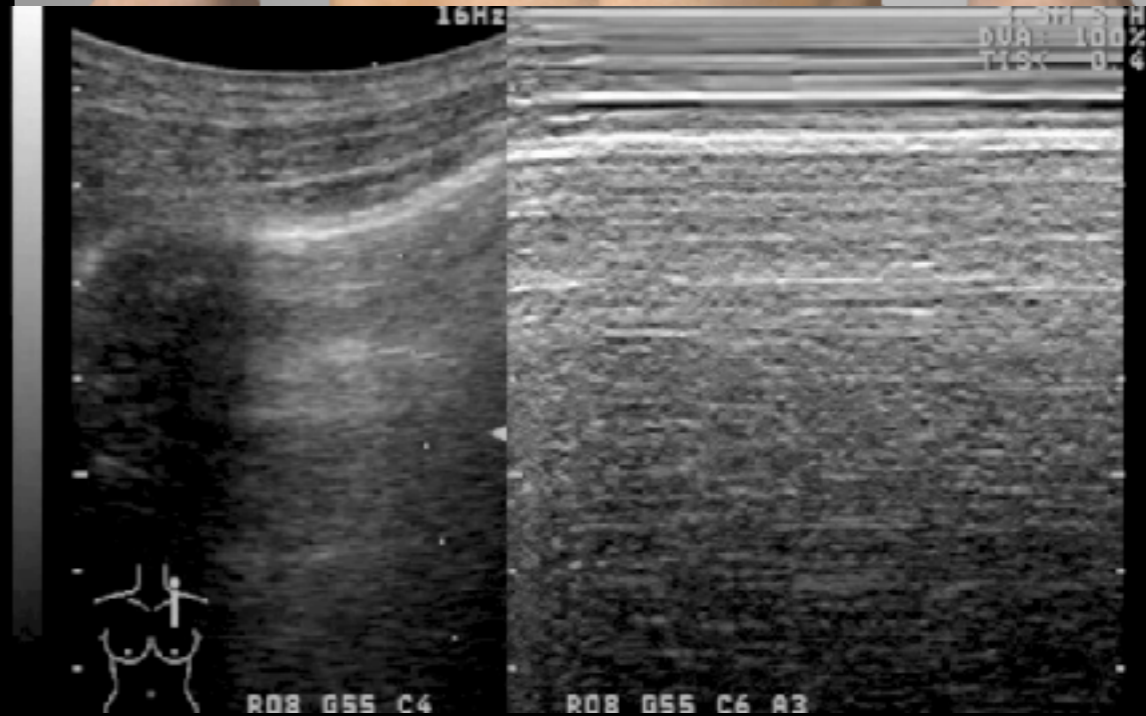
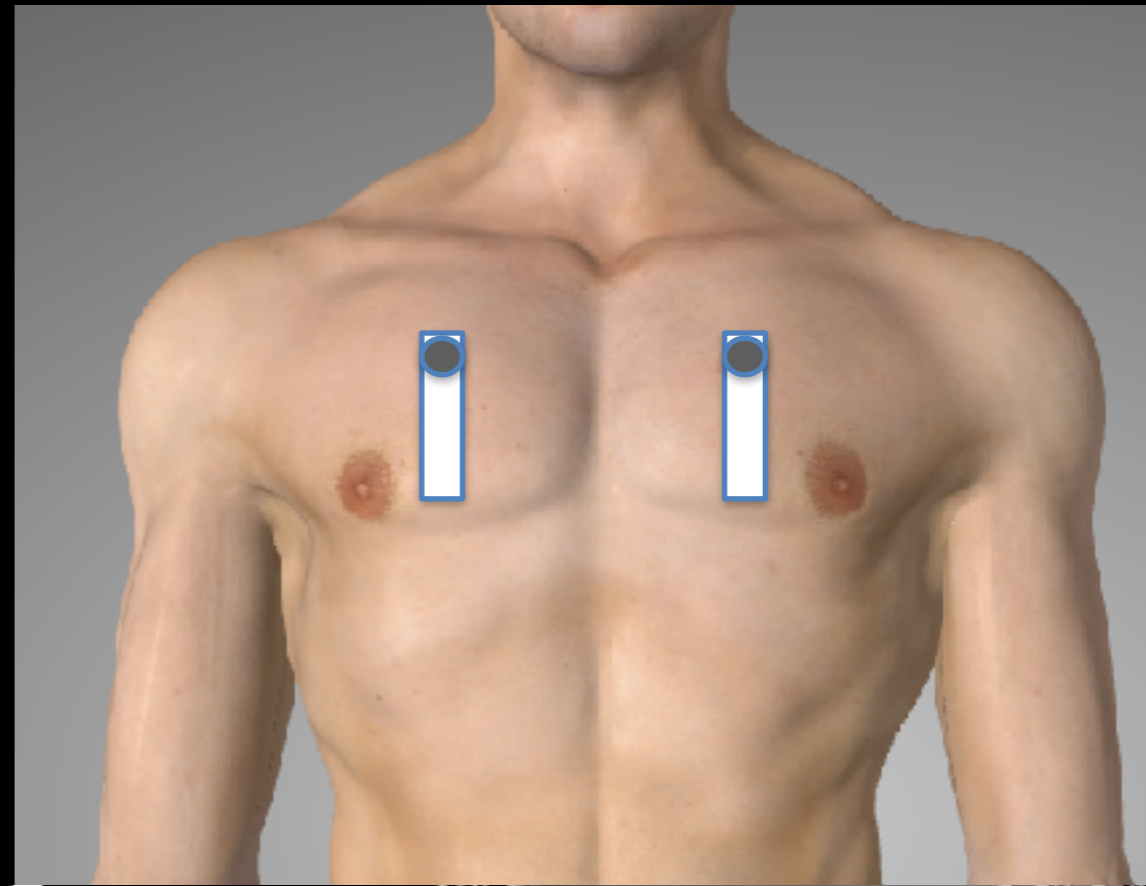
2D
HGen
Gn 100
C 56
3/3/3



到院前超音波

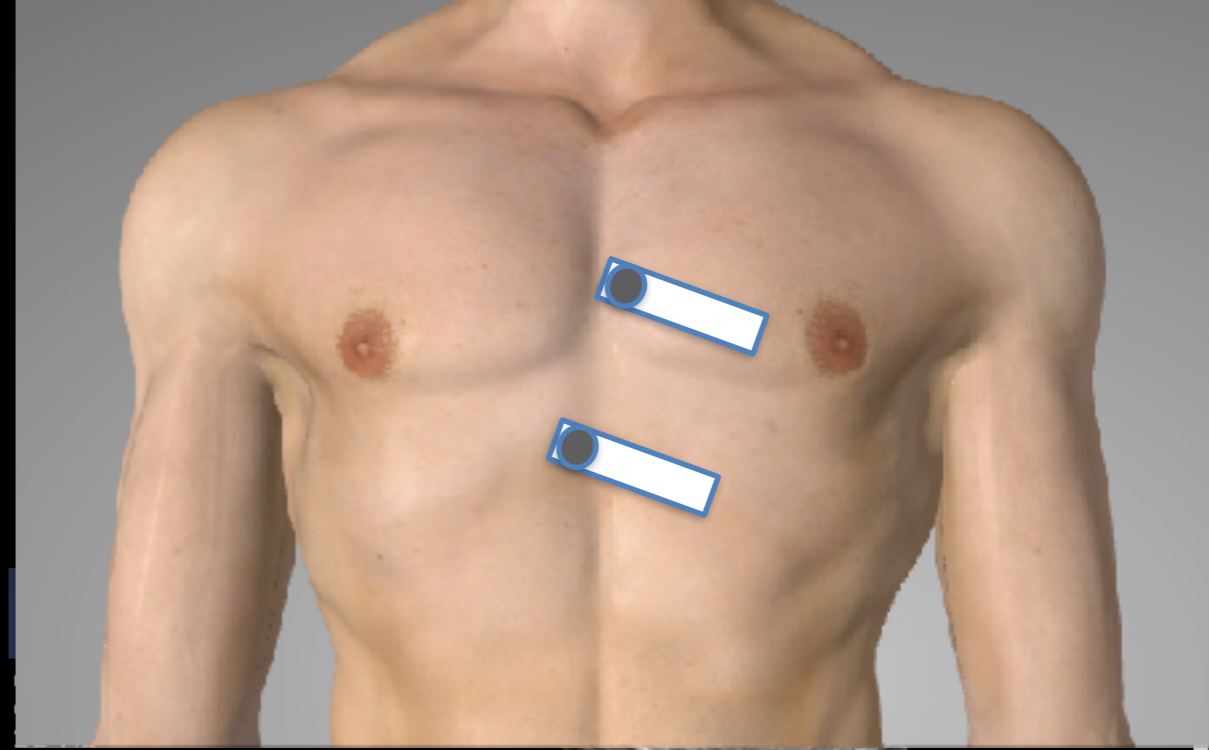
Prehospital ultrasound

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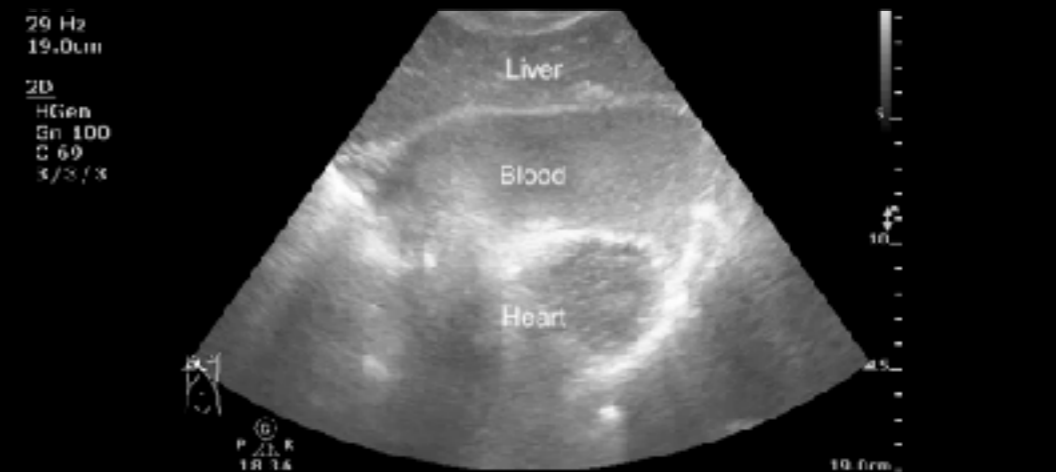


到院前超音波

Prehospital ultrasound

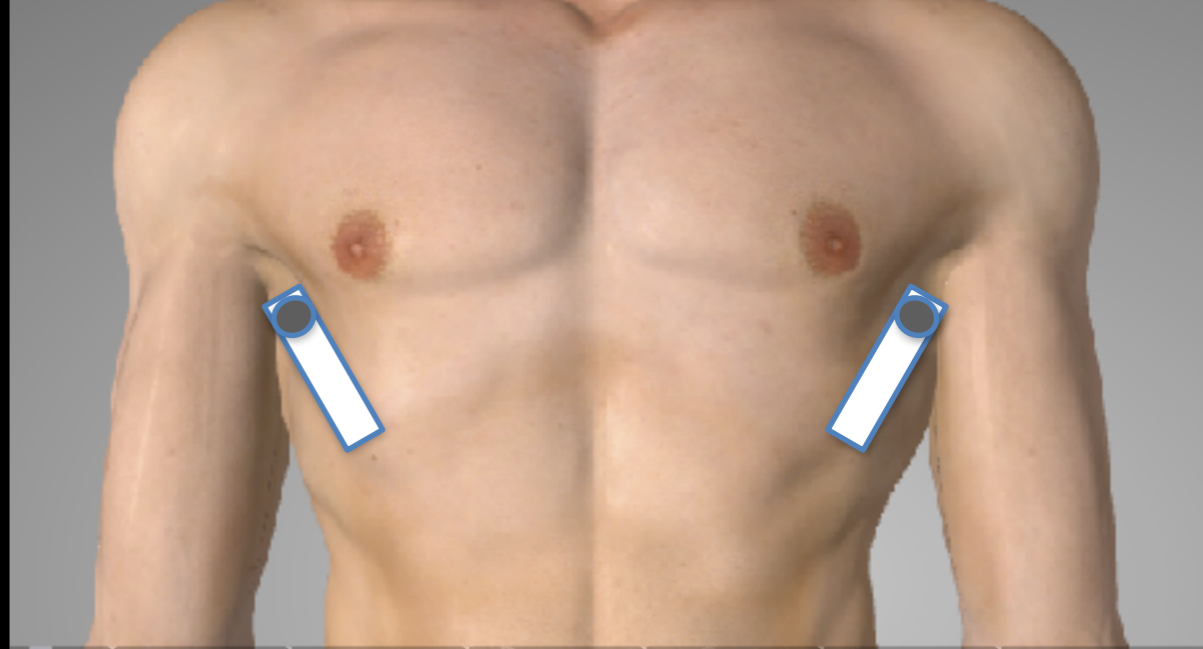


- 氣 (A)** Airway / 插管一根管
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到院前超音波

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