羊水栓塞案例分享

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新竹台大醫院婦產部

2022/09/18

台大醫院 新竹分院

Case 1

Present Illness

39 歲
雙胞胎妊娠 34週
前置胎盤合併產前出血及胎位不正
接受緊急剖腹手術

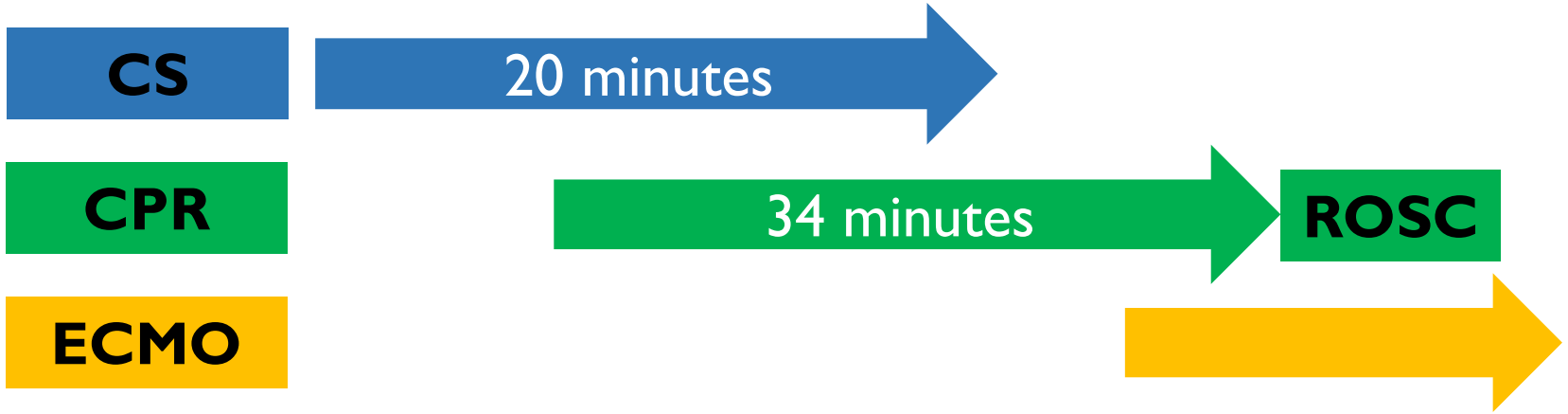
09:36 ~ 09:38

- 兩新生兒娩出
  - 出生體重分別為: 1670/1876 公克
  - Apgar score: 7 → 9 / 6 → 8

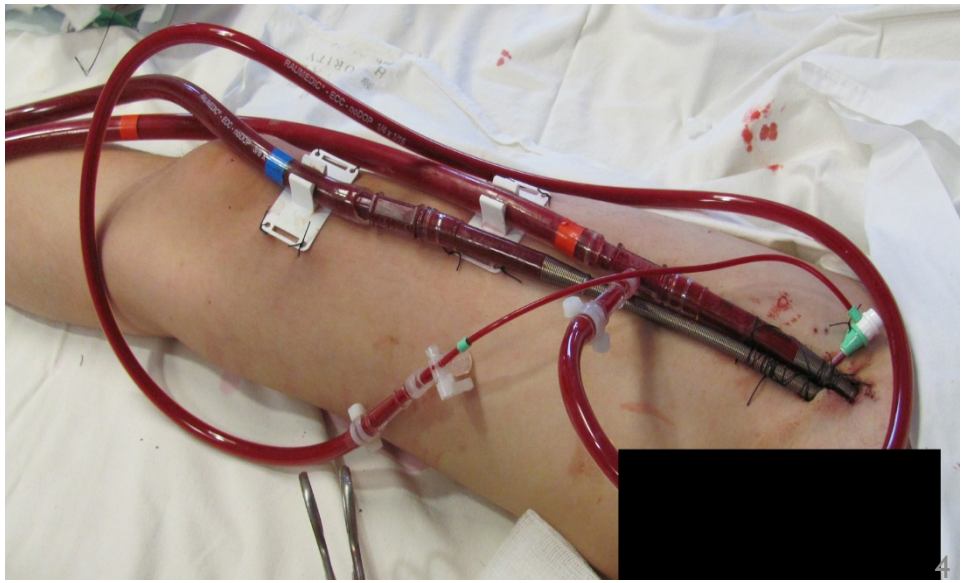
09:39

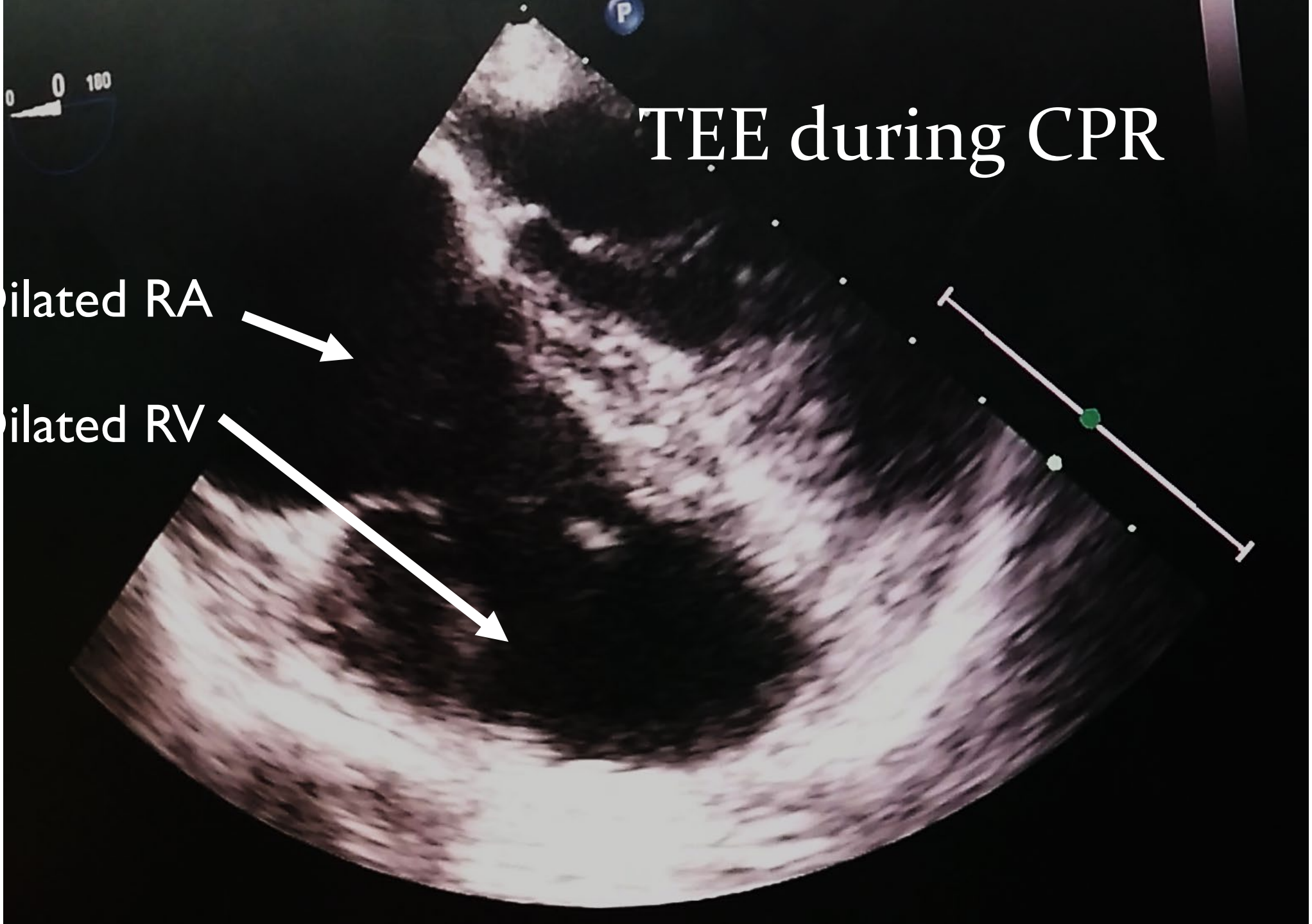
意識喪失, 心搏減速及 心跳停止

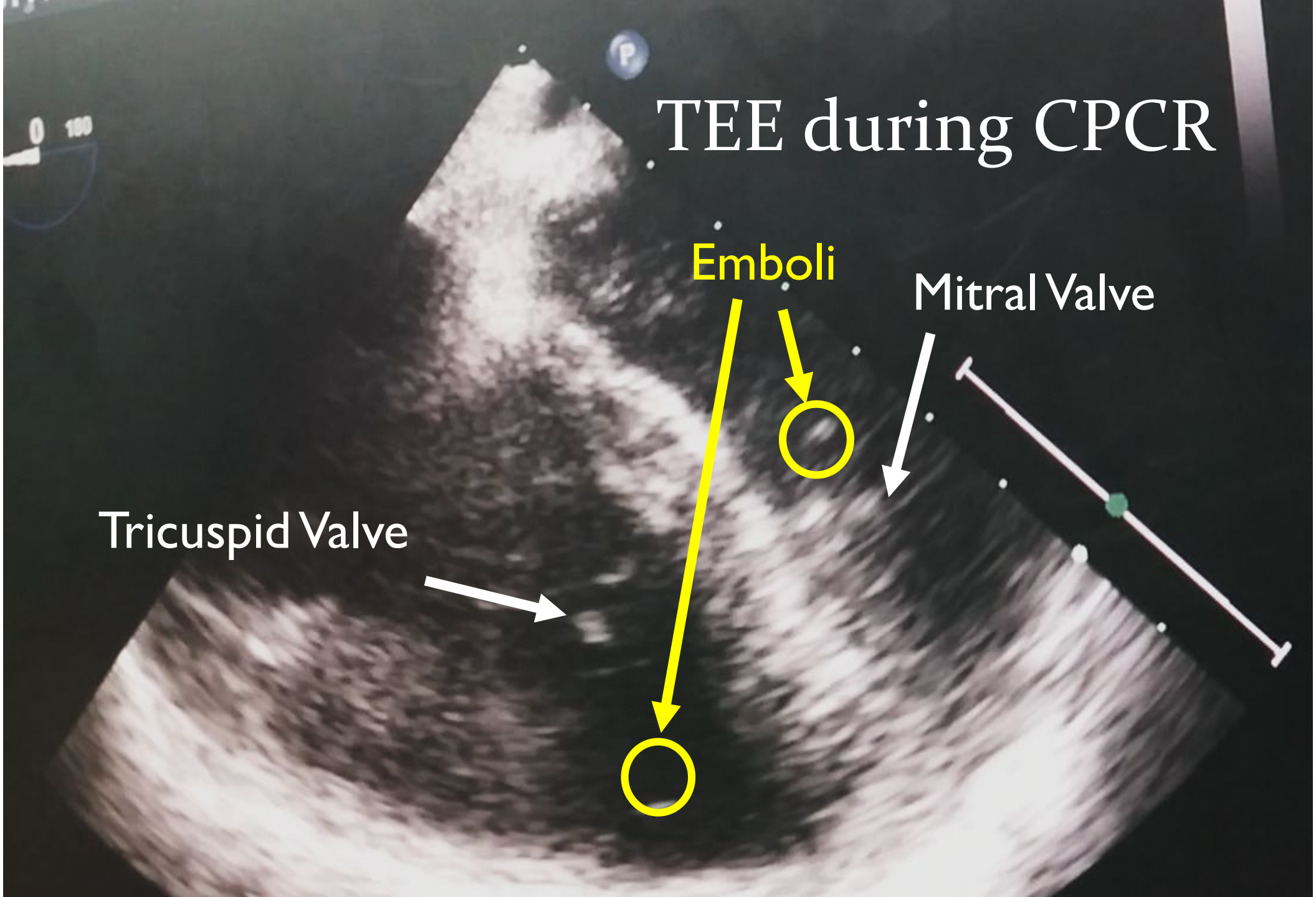
臨床治療過程



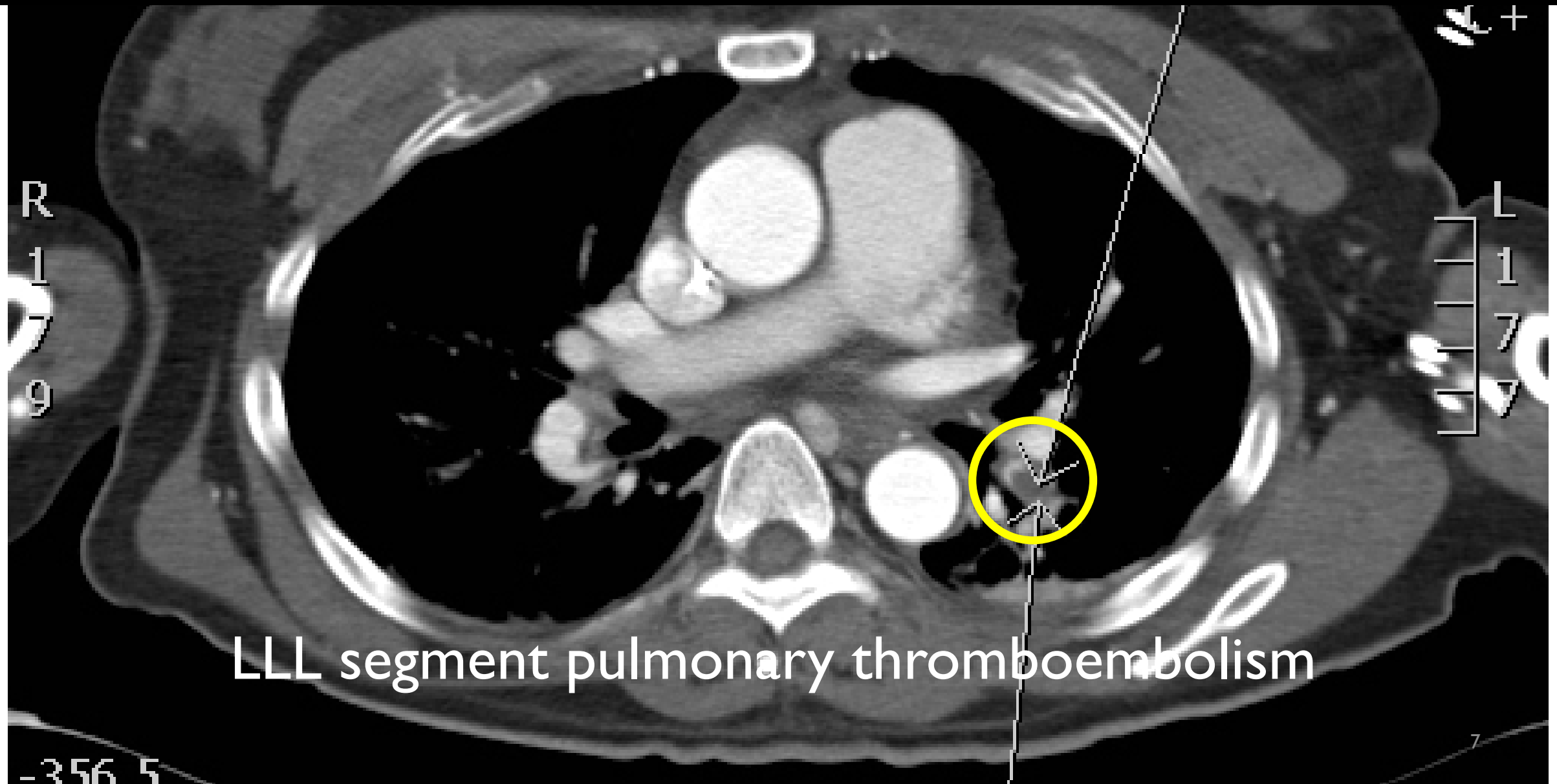
- 於CPR中使用經食道超音波檢查(TEE)
- 恢復循環後接受全身電腦斷層掃描
- 轉送加護病房



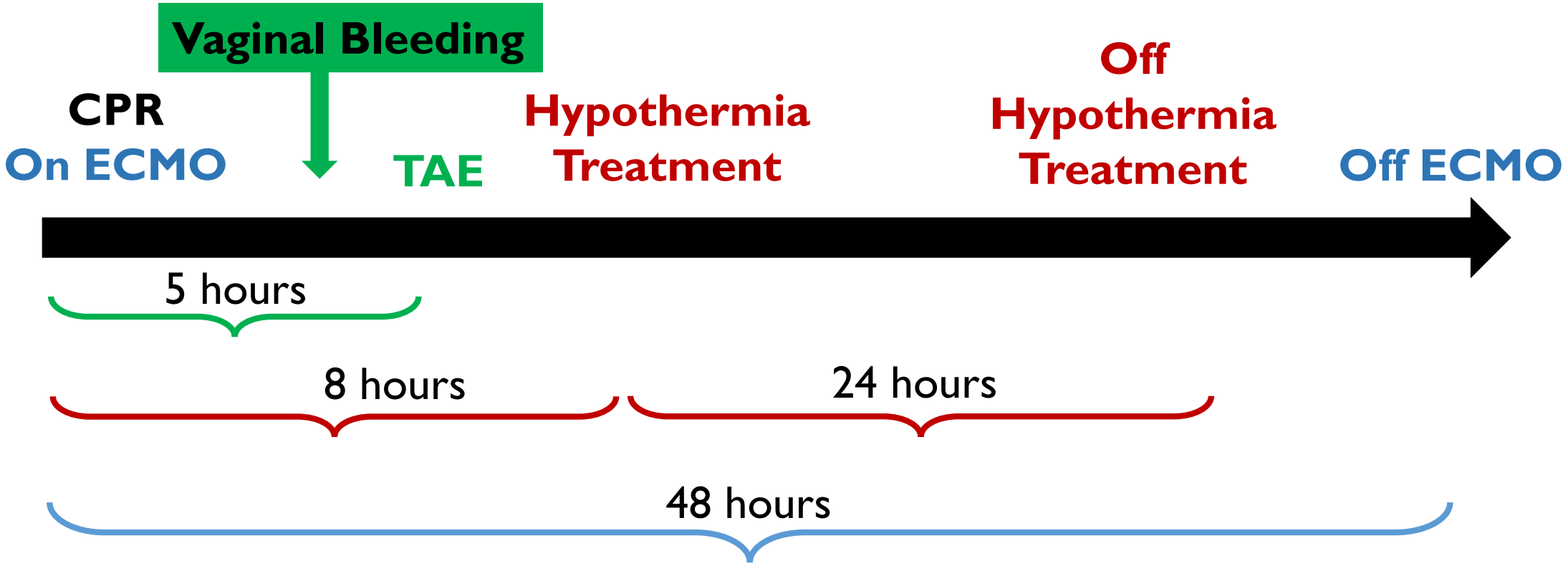

TEE during CPR
ilated RA
ilated RV


TEE during CPCR
Emboli
Mitral Valve
Tricuspid Valve

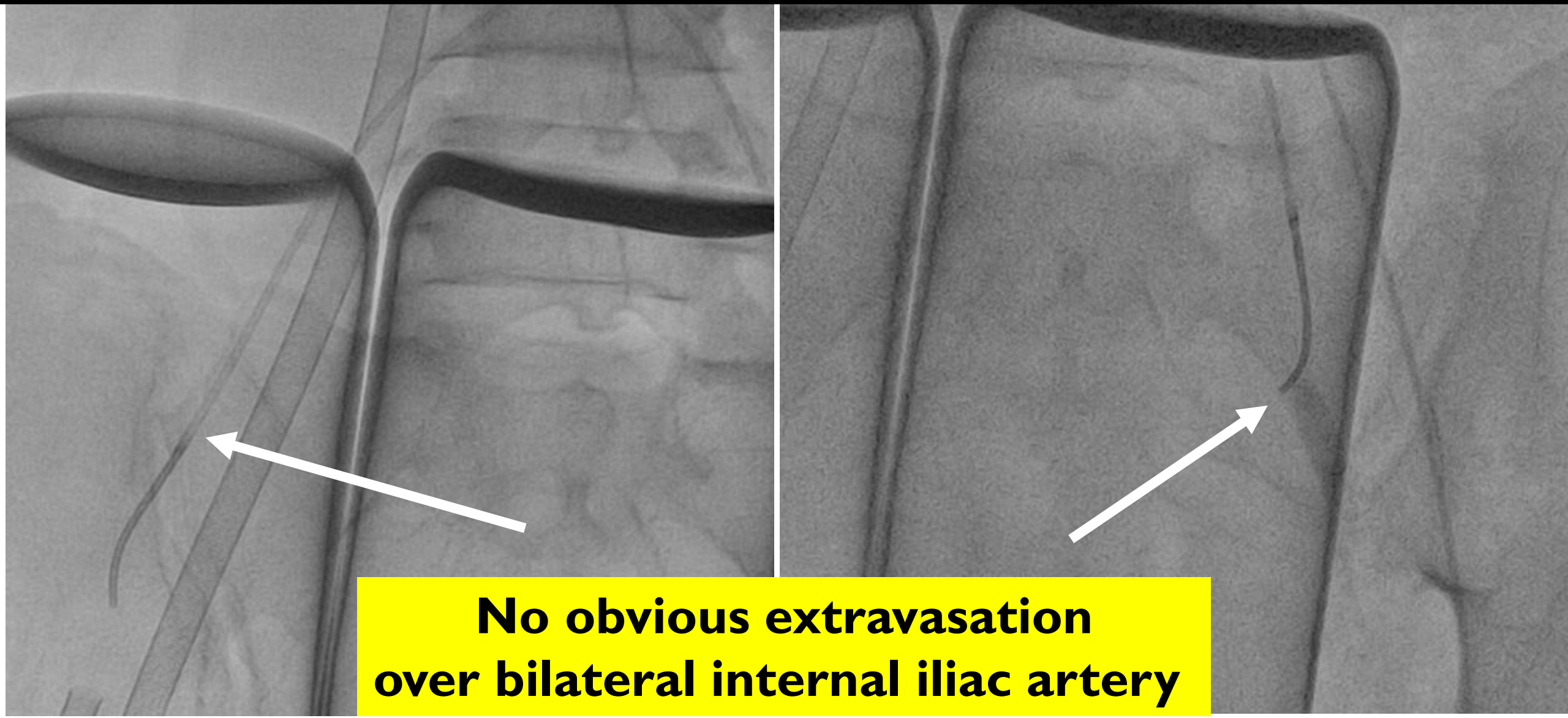
CT after ROSC



治療過程

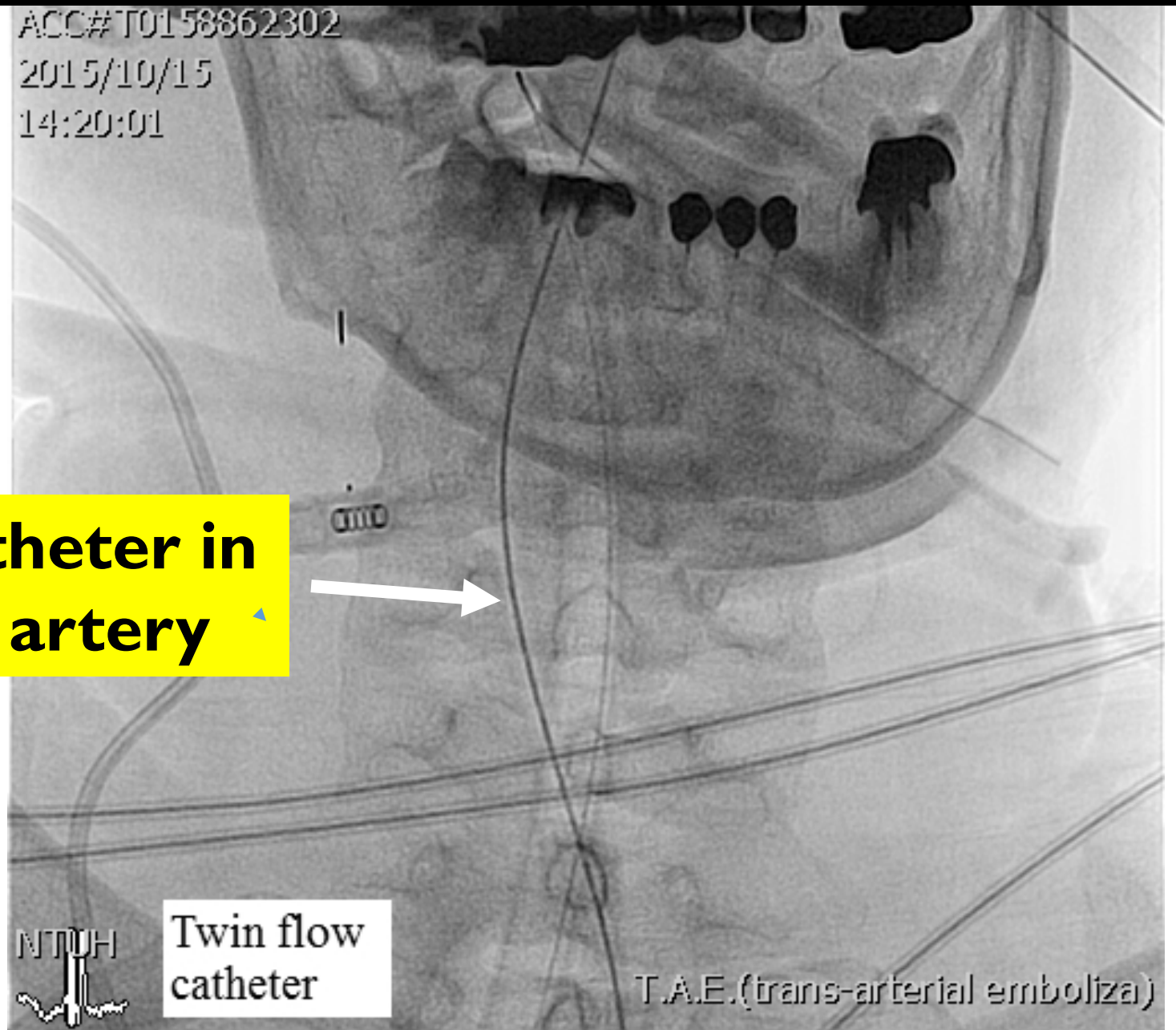

Vaginal Bleeding
CPR
On ECMO
TAE
Hypothermia
Treatment
Off
Hypothermia
Treatment
Off ECMO
5 hours
8 hours
24 hours
48 hours

經動脈栓塞術



No obvious extravasation over bilateral internal iliac artery

低溫療法之導管放置



Twin flow catheter in right carotid artery

預後

- 追蹤電腦斷層
  - 已無可見肺部栓塞

- 病患及兩新生兒
  - 於三個月後追蹤，*無神經學後遺症*

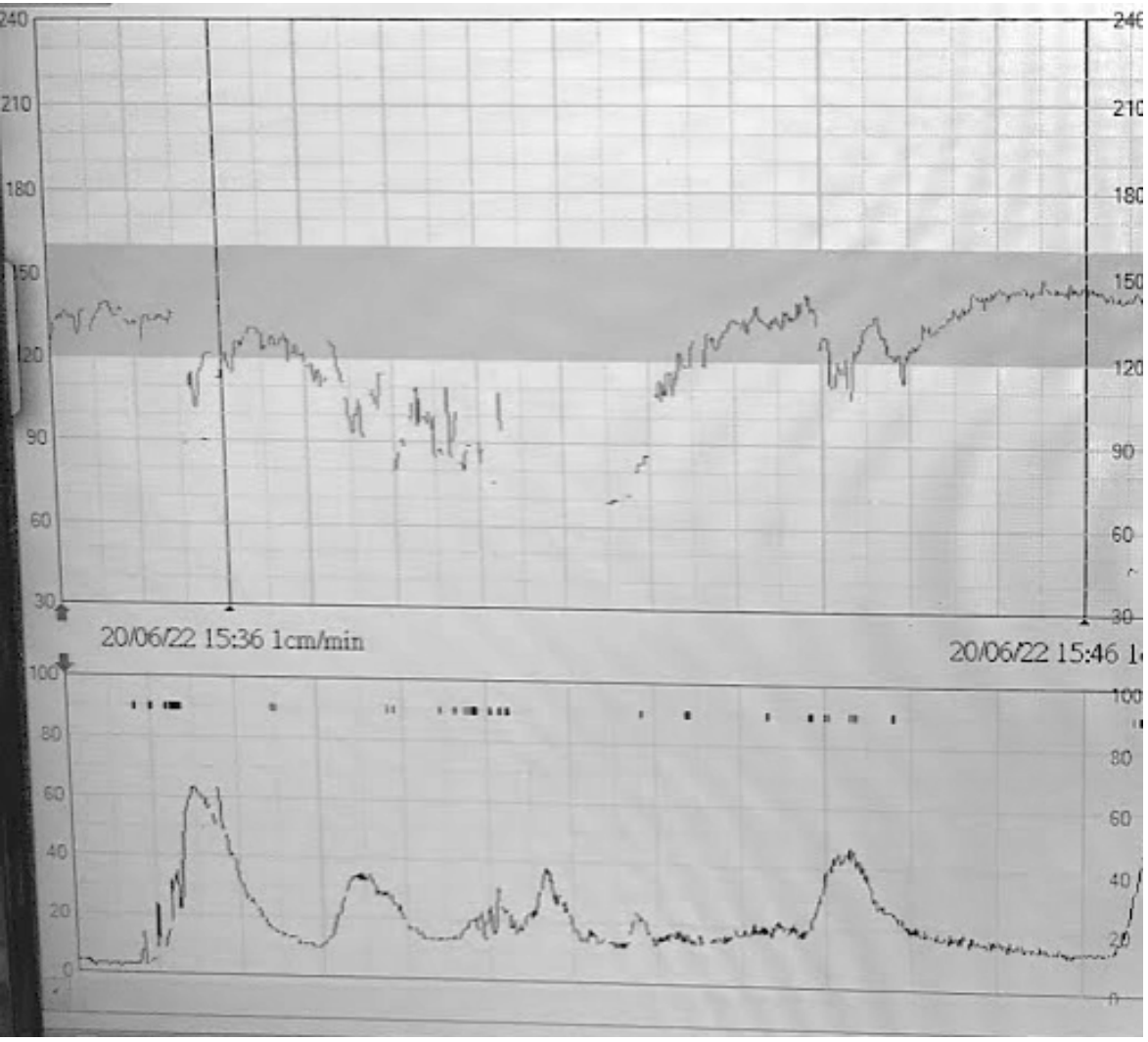
Case 2

Brief history

- 35 year-old women, G1P0
- Prenatal examination: GDM with good control
- Pregnancy for 39+3 weeks with full term, for induction

Present Illness

NST

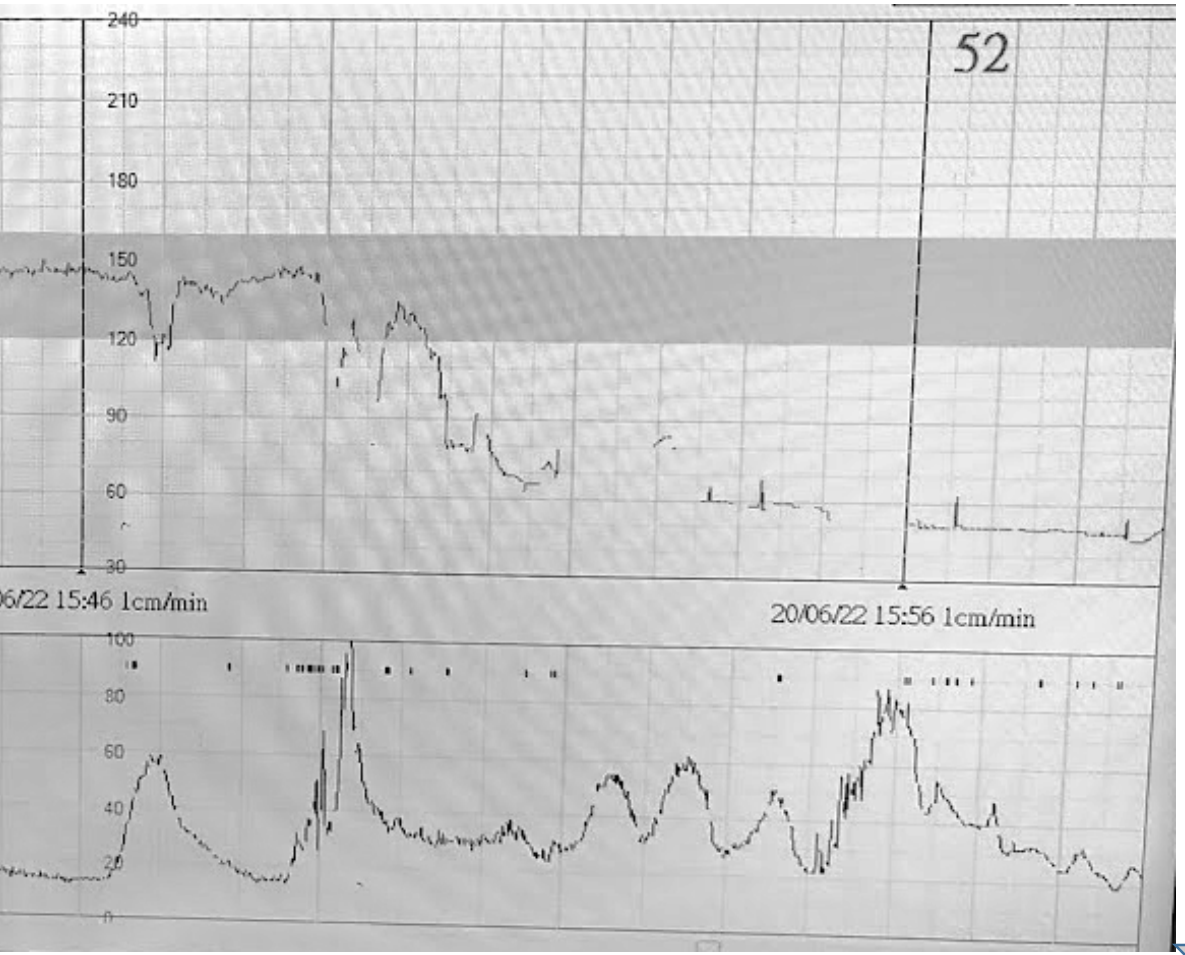


6/22 15:36

FHB deceleration to around 70/min for 5 min

PV: os 5cm

OFF Oxytocin , O2 supply



6/22 15:49

FHB 60-70/min

Cyanosis SpO2:76-78%, BP=124/68 mmHg

Conscious clear

PV: os 9cm, station 0

Tx: O2 supply 10L/min, SpO2:76%

Present Illness

6/22 15:55

Conscious loss, seizure like movement, BP undetectable!

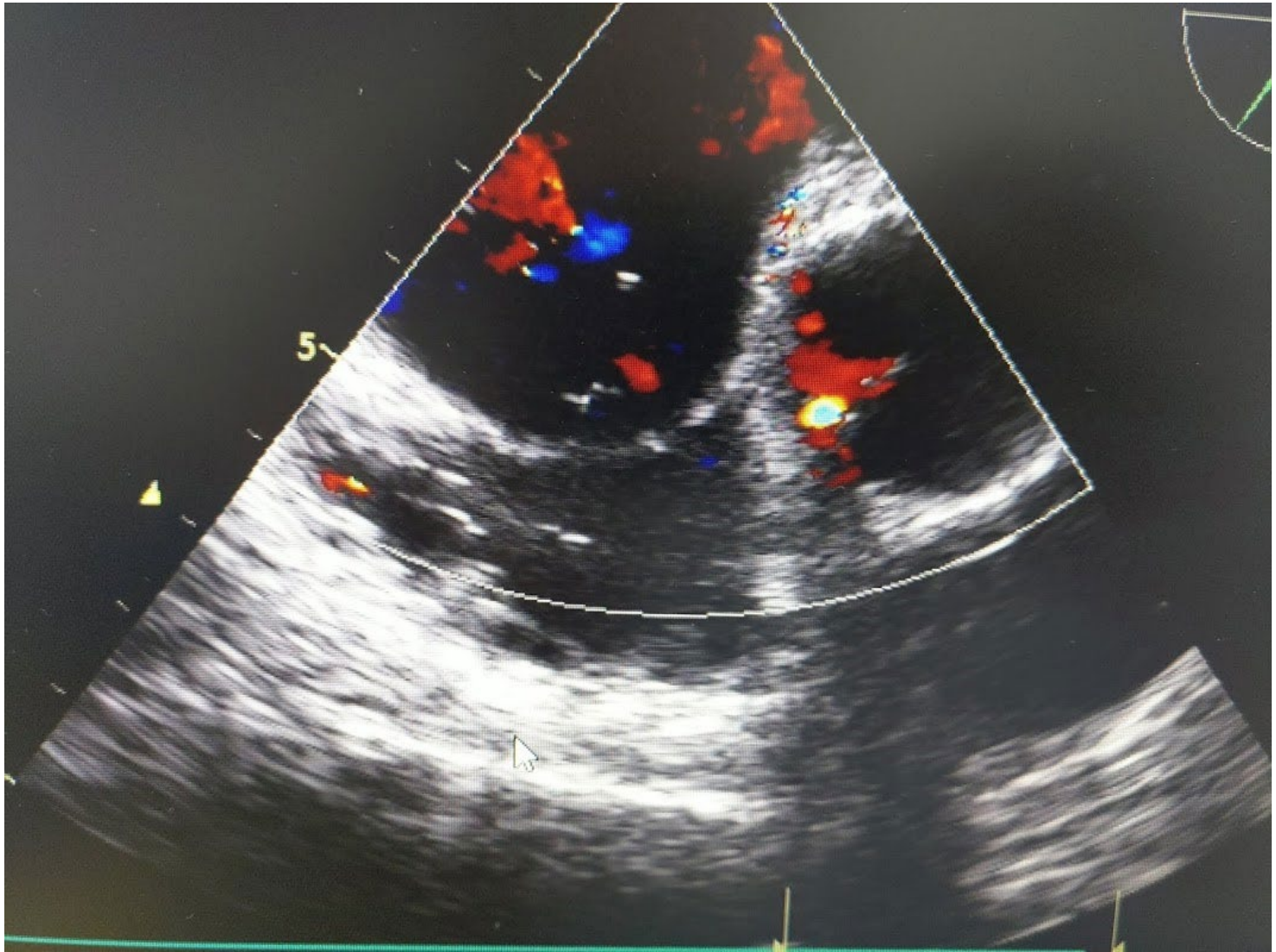
FHB 50-60/min

Ambu bagging + CPR

6/22 16:12 Perimortem C-section

- Apgar Score: 0 to 3 to 7 BBW=3490gm
- On table VA-ECMO setup
- TEE: dilated RV with debris
- Bilateral uterine artery ligation, ligation of left ovarian artery vessels EBL: 3500ml

Trans-esophageal echocardiography



Present Illness

6/23 Unstable BP under inotropic agent. Poor ECMO function with 1000ml blood from abdominal drain tube
TAE: bilateral internal iliac artery gelform + coil embolization.

6/26 10:28 Remove ECMO.

7/2 Slug speech, EEG: intermittent generalized epileptiform discharges -> Levetiracetam added

7/9 Discharge with minimal sequalae

Tentative diagnosis

1.Pregnancy for 39+3 weeks, with amniotic fluid embolism , status post perimortem cesarean section & VA- ECMO insertion

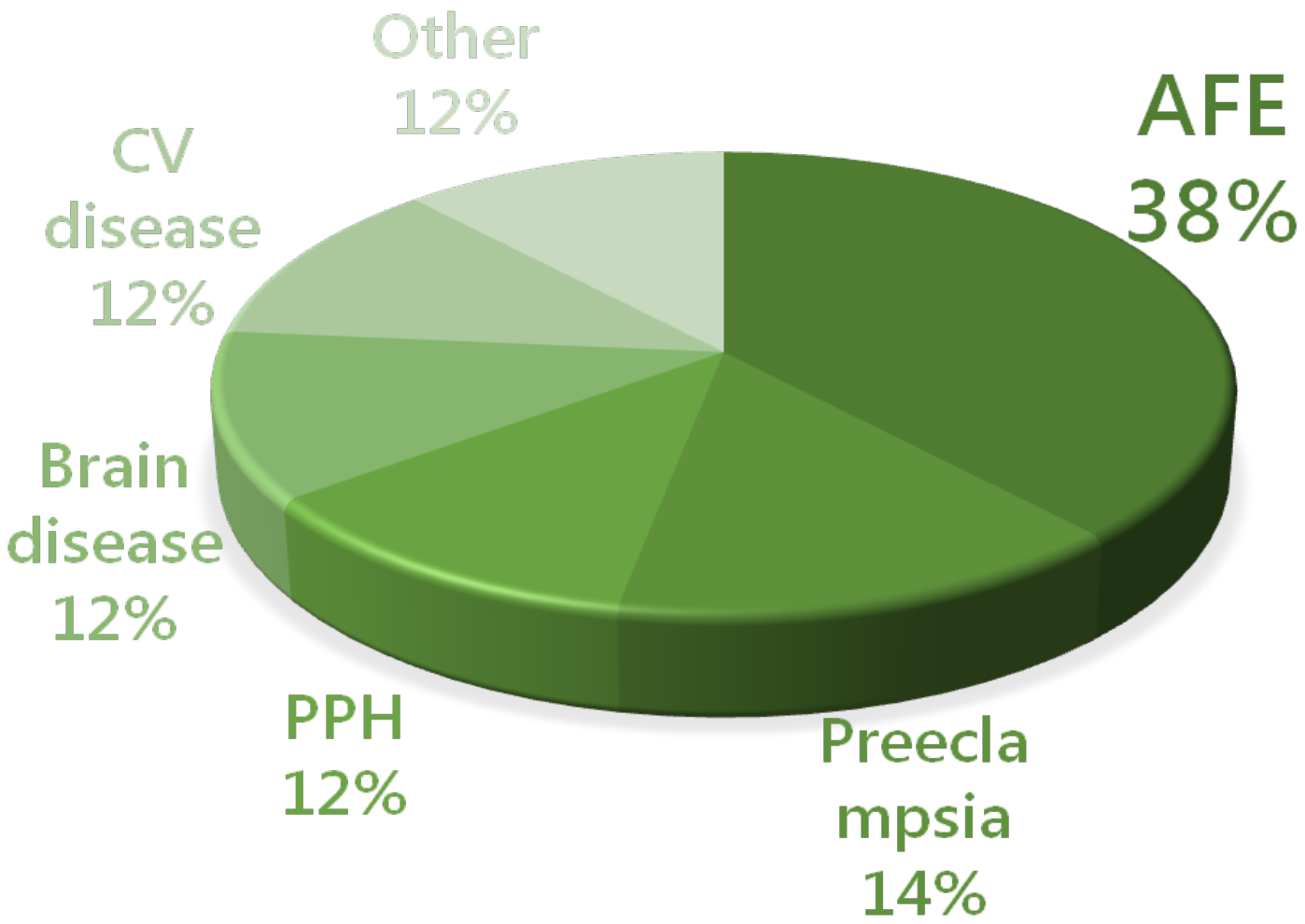
2.DIC and postpartum hemorrhage, status post bilateral internal iliac artery embolization

Discussion

羊水栓塞

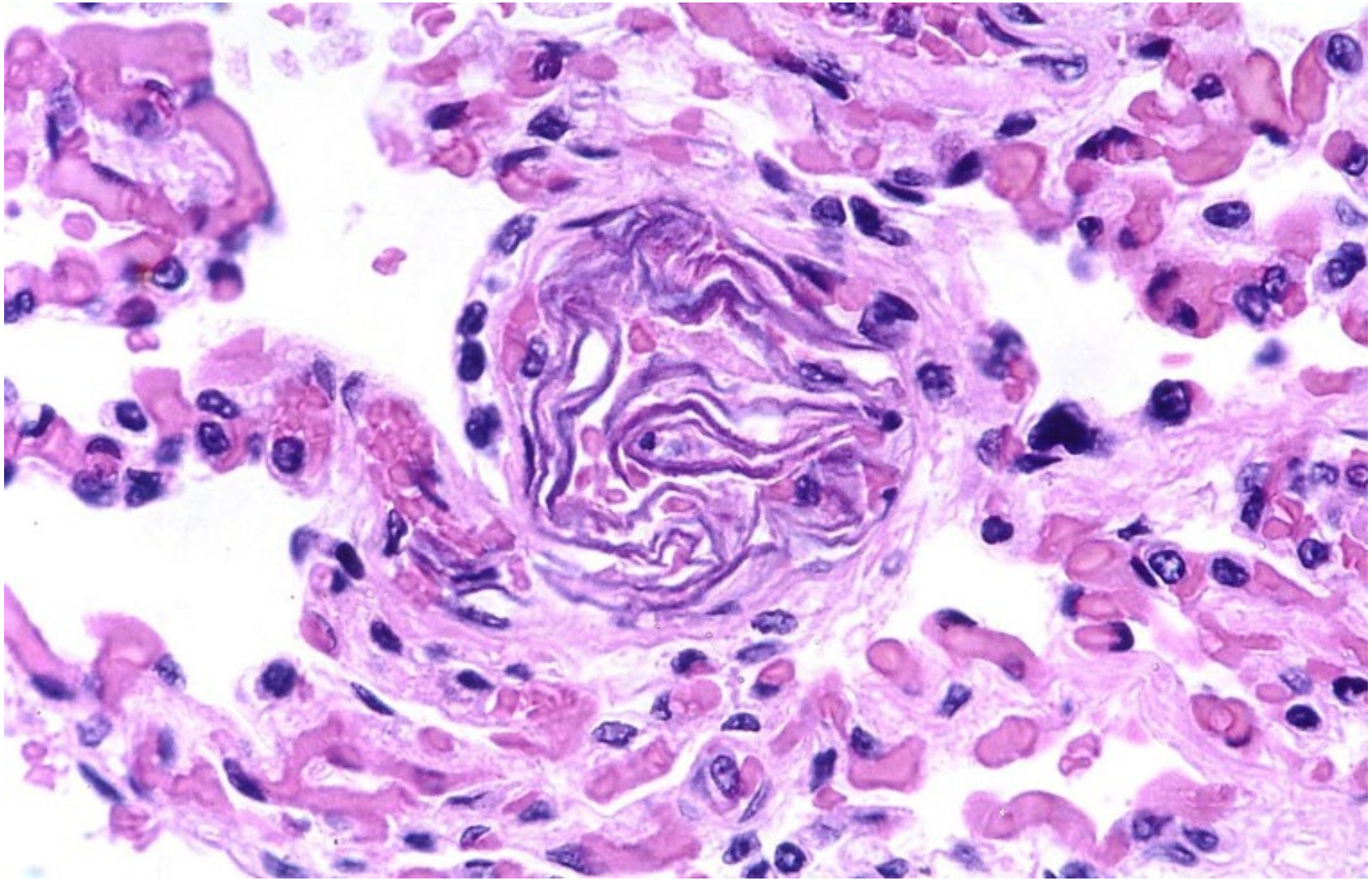
- 發生率: 1 in 16,000 to 50,000, 常見於待產中/剛分娩後
- 死亡率: 20~60%
  - 死亡的患者之中有一半發生在第一小時快速致命！
- 60%的存活者有神經學後遺症

TAIWAN



TJOG 54 (2015) 705e708

Diagnosis



病理診斷：

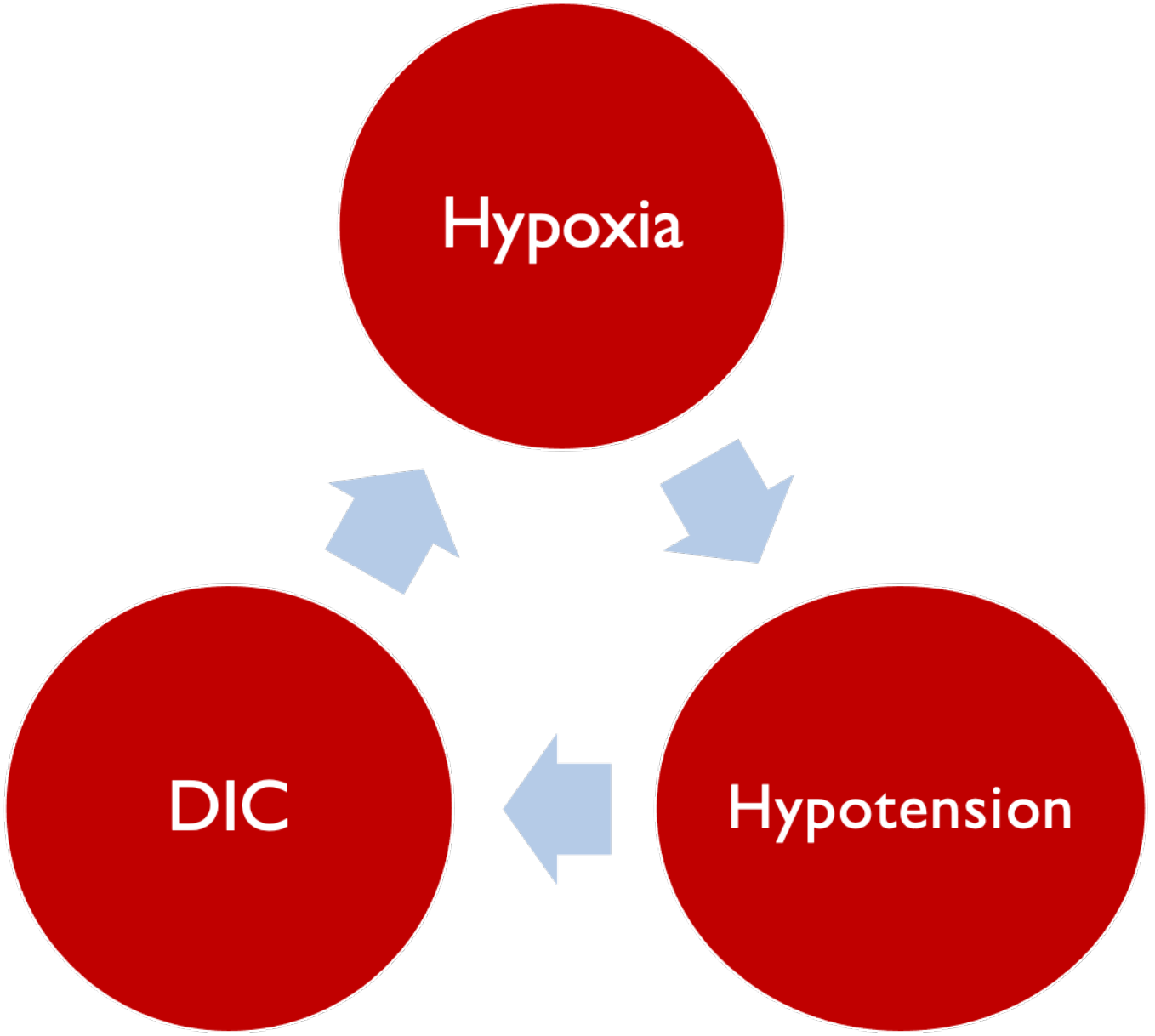
肺部血管內有羊膜/胎脂填塞

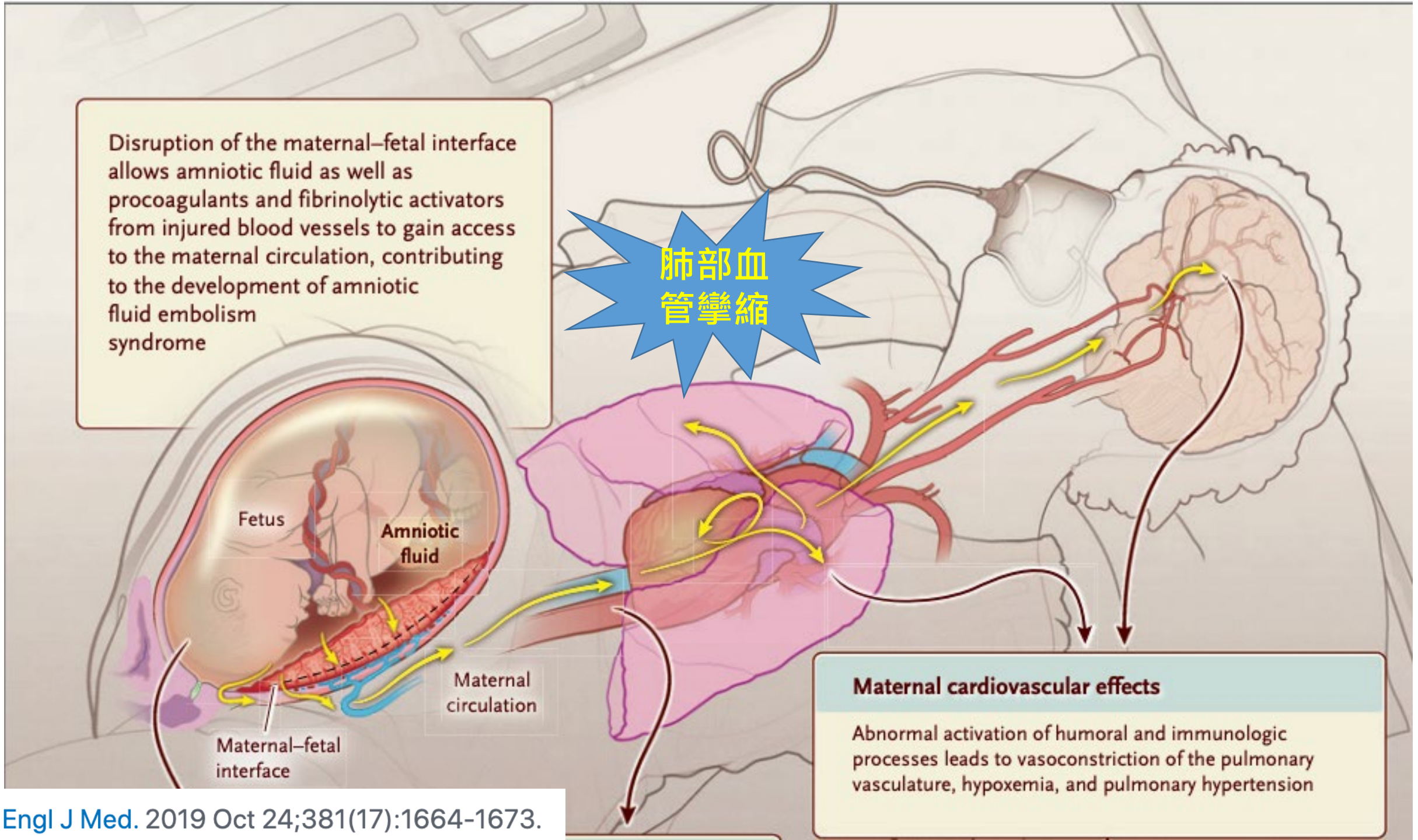
臨床診斷：

不明原因

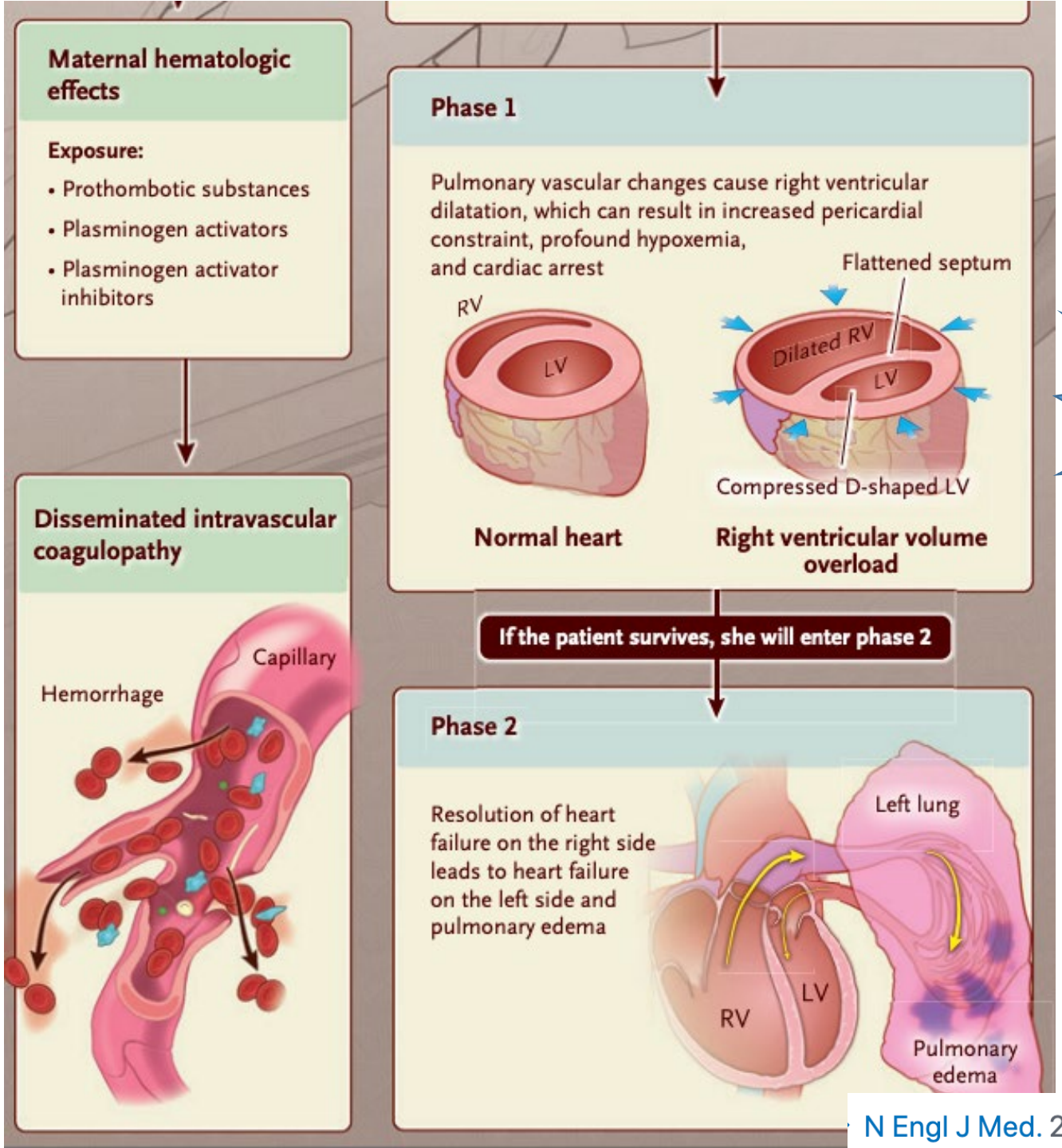
急性心肺衰竭

Death Triad





N Engl J Med. 2019 Oct 24;381(17):1664-1673.



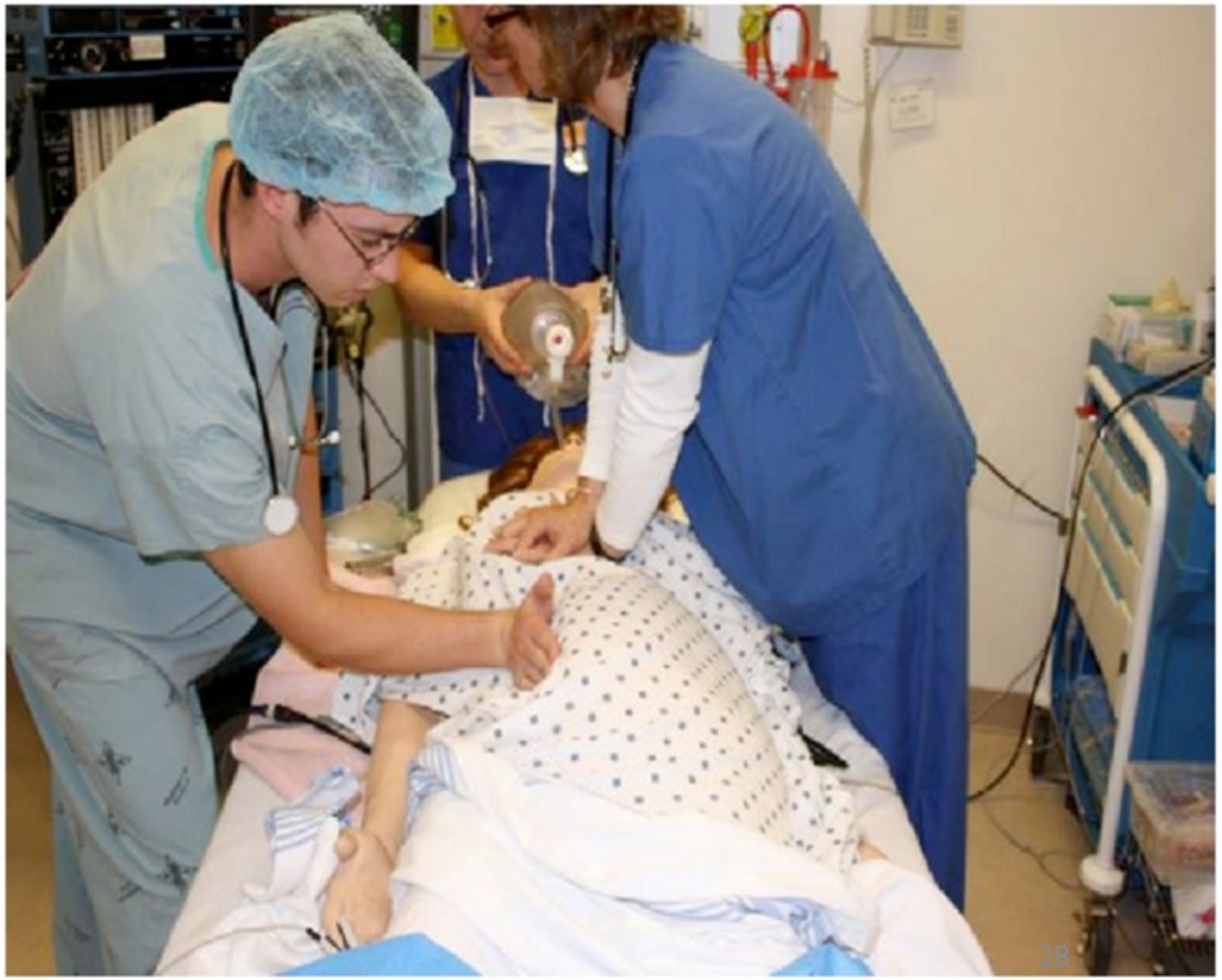
DIC

急性心衰竭

N Engl J Med. 2019 Oct 24;381(17):1664-1673.

處置 - 心肺衰竭

- 高品質CPR
- 子宮往左推
- 移除胎心音監測器
- 緊急剖腹產（if 4min CPR無效）
- 若無法回復自主血液循環：ECMO

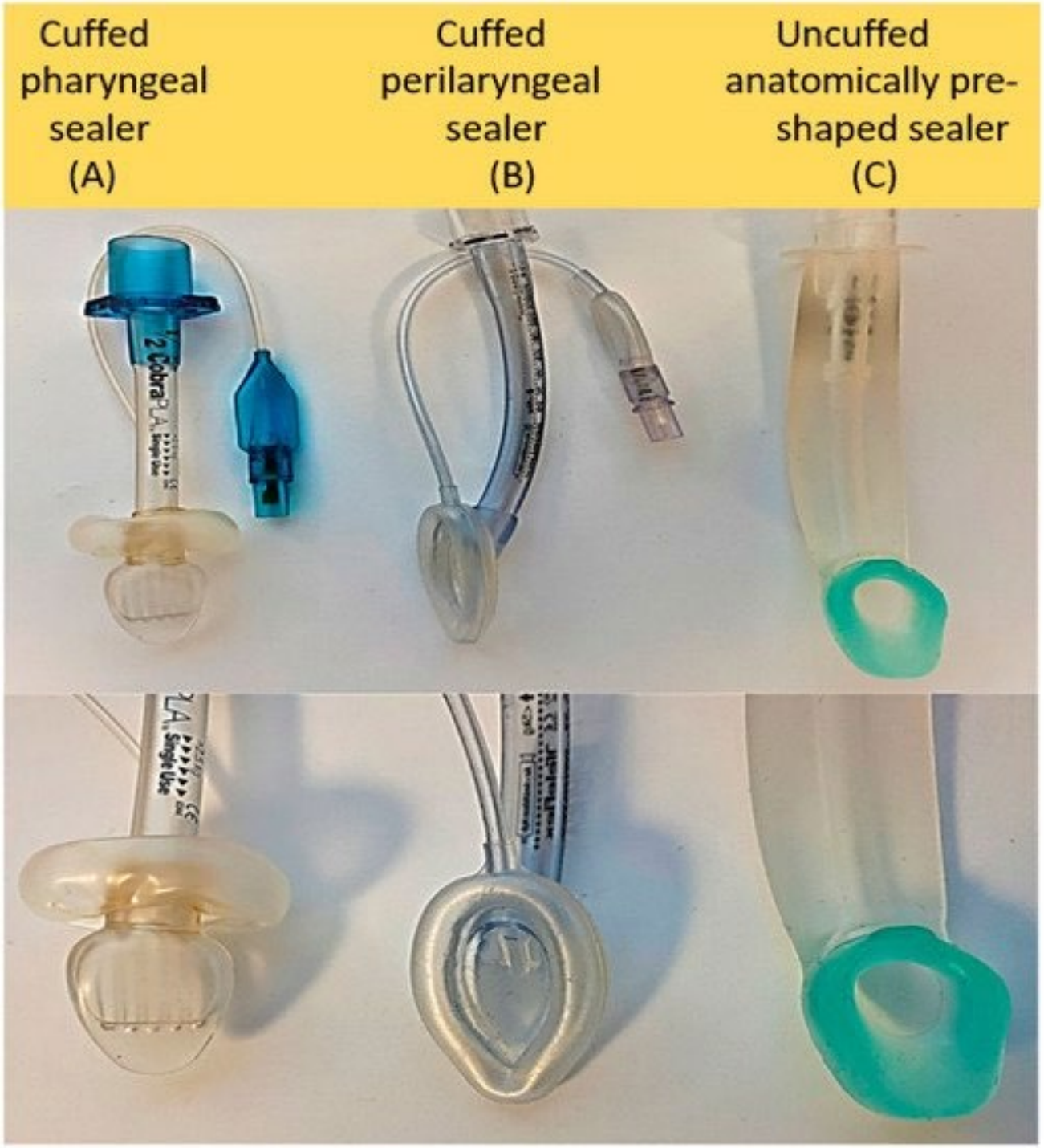


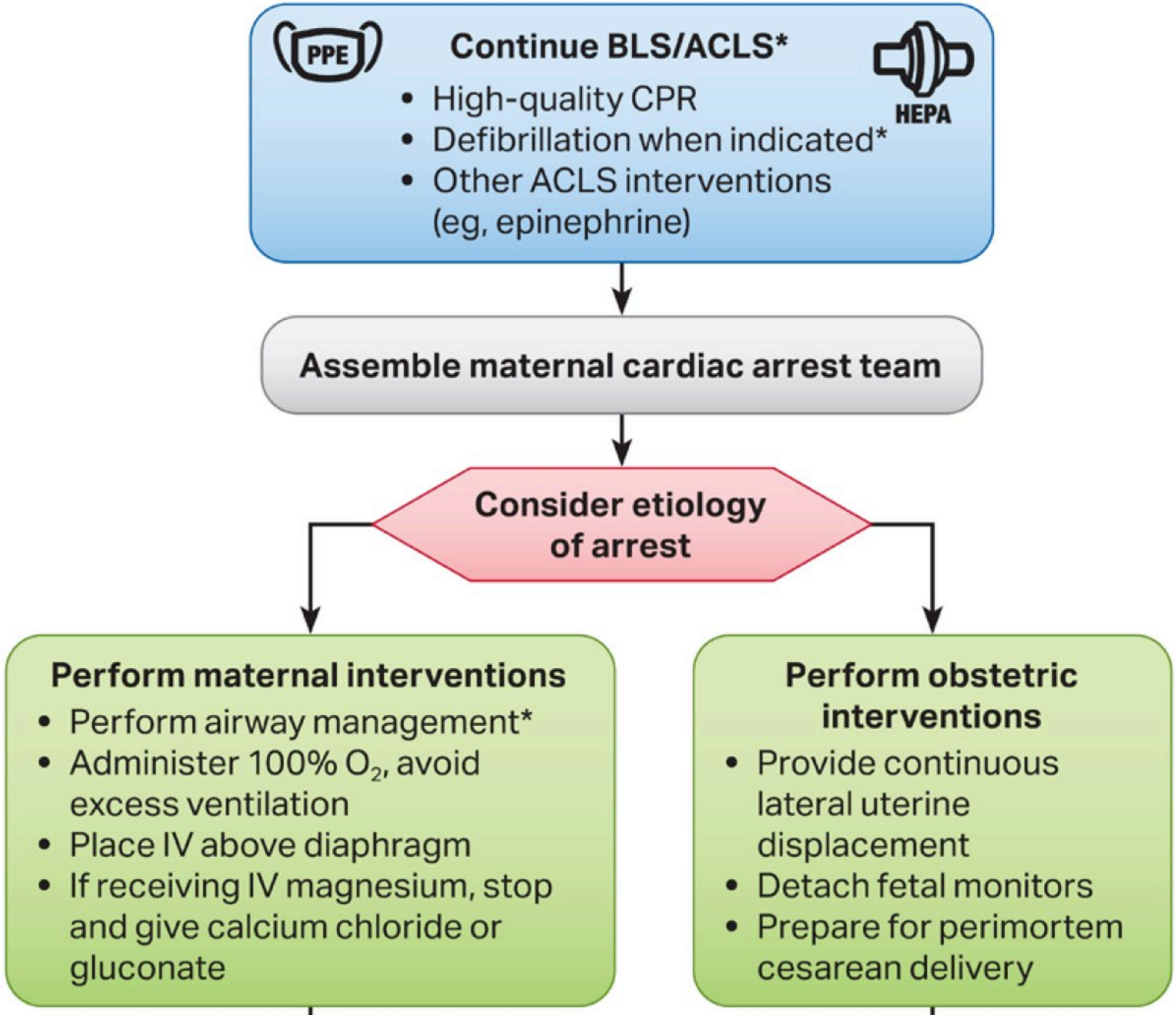
Maternal cardiac arrest

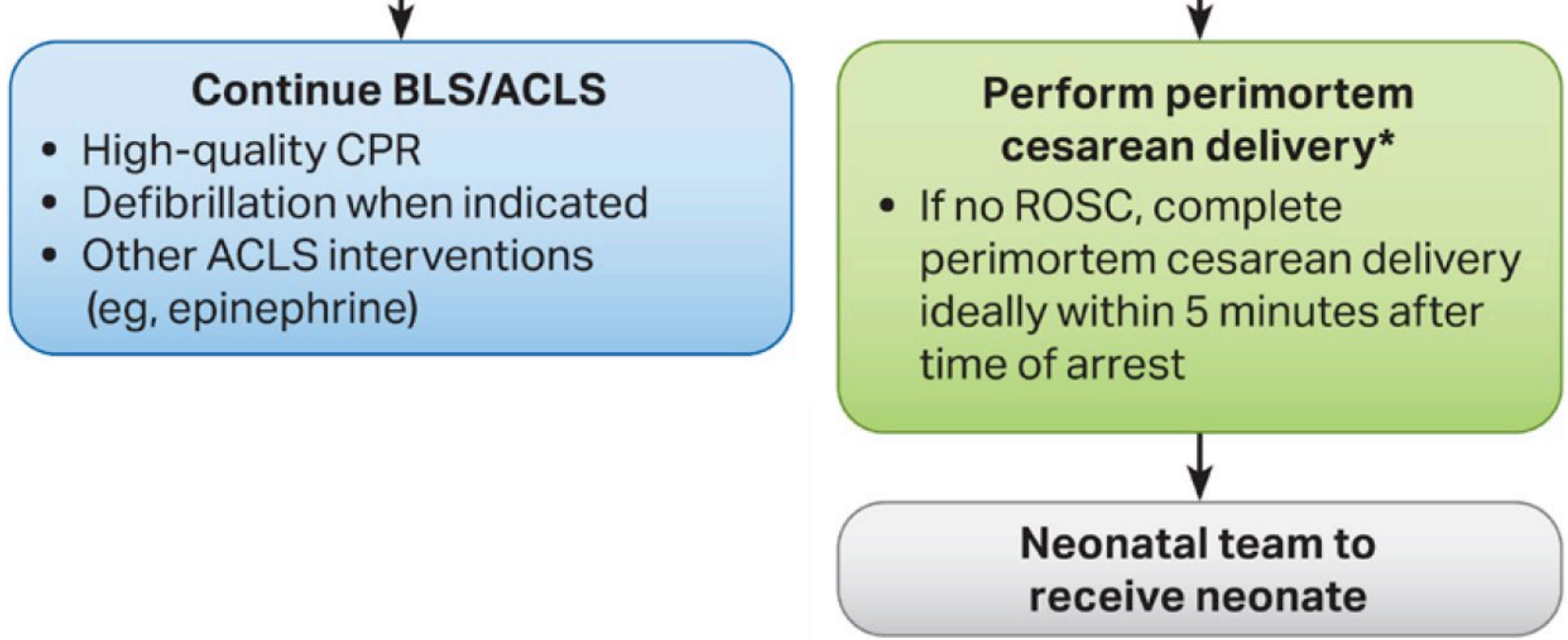
Potential Etiology of Maternal Cardiac Arrest
A Anesthetic complications
B Bleeding
C Cardiovascular
D Drugs
E Embolic
F Fever
G General nonobstetric causes of cardiac arrest (H's and T's)
H Hypertension

Difficult airway!

"Failed intubation during pregnancy approaches 1/250 vs 1/2000 in nonpregnant population"

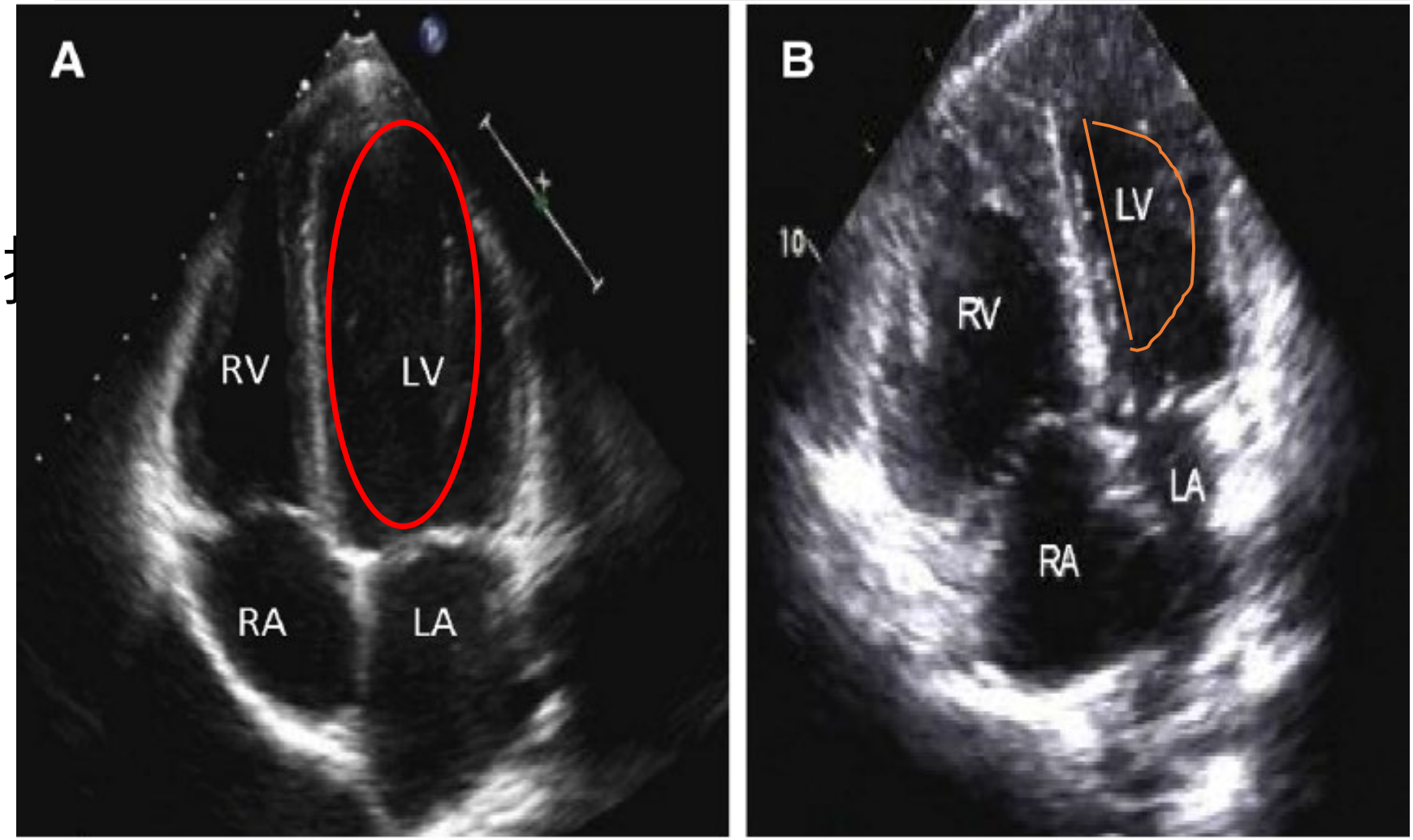






處置 - 右心衰竭

- 插管保持通氣
- 避免大量輸液
- 給予肺部血管
- 給予強心劑



Perimortem C/S

- Operative delivery within 4 to 5 minutes of beginning CPR if
  - >20weeks of gestation
  - Circulation is not restored

    ….. these goals rarely can be met in actual practice

- Fetal monitoring and ultrasound to confirm presence of fetal heart tones are NOT necessary.

Reported cases of maternal and neonatal survival rates with perimortem cesarean deliveries.

Authors	Survival rate		Received PMCD	4-to-5-minute rule	
	Mother	Neonate			
Rose et al. (2015) [2]	(17–59%)	(61–80%)	–	–	–
Katz et al. (2005) [4]	20/38 (52.6%)	34/38(twin*3,triplet*1) (89.4%)	38/38	<5 min: 11/34 neonates 6–10 min: 4/34 11–15 min: 2/34 >15 min: 7/34 Unknown: 10/34	
Einav et al. (2012) [5]	51/94 (54.3%)	42/66 (63.6%)	76/94	<5 min: 4/57 <10 min: 18/57 <15 min: 32/57	
Dijkman et al. (2010) [6]	8/55 (15%)	5/55 (9%)	12/55	IHCA <5 min: 0 5–15 min: 3 16–30 min:4 >31 min: 1	OHCA <5 min: 0 5–15 min: 1 16–30 min: 1 >31 min: 2
Beckett et al. (2017) [7]	38/66 (57.6%)	46/58 (79.3%)	49/66	<5 min: 30/49 ≧5 min: 17/49 Unknown: 2/49	

葉克膜
Extracorporeal Membrane Oxygenation (ECMO)

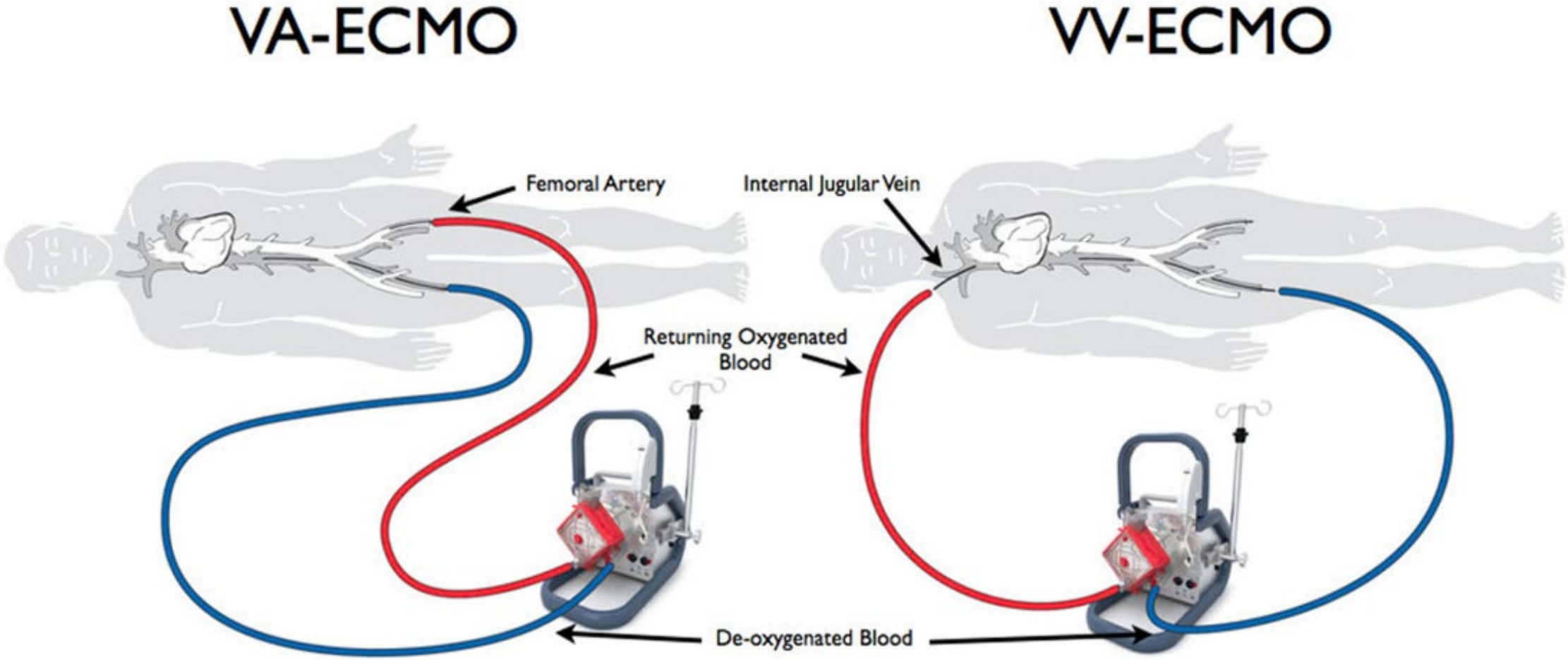
葉克膜

優點

- 提供極度病危病患氧合(Oxygenation)、循環支持(Circulation support)

缺點

- 造成出血(Bleeding)
- 凝血功能異常(Coagulopathy)
- 溶血(Haemolysis)
- 腔室症候群 (Compartment syndrome)
- 下肢缺氧(Leg ischemia)



靜脈—動脈 葉克膜 (VA-ECMO)

提供氧合及循環支持

適用對象：循環衰竭±呼吸衰竭

靜脈—靜脈 葉克膜 (VV-ECMO)

單純提供氧合支持

適用對象：單純呼吸衰竭

懷孕期及周產期之葉克膜使用

Table 3. Use of ECLS in Pregnancy and Postpartum – A Summary of the Cases Reported in the Literature

Reference	No of Patients	Pregnancy Status (%)	Indication for ECLS	Mode of ECLS (V-A/V-V)	Survival	
					Maternal (%)	Fetal (%)
6–8	3	33% pregnant and 66% Postpartum	Amniotic fluid embolism	2 V-A and 1 V-V	100	100
9	1	Postpartum	Atonic uterine bleeding	V-A	100	100
10	1	Pregnant	Pulmonary hemorrhage-related arrest	V-V	100	0
11	1	Postpartum	Cerebral venous thrombosis/ respiratory failure	V-V	100	100
5	1	Pregnant	ARDS: due to all trans retinoic acid	Lung assist	100	0
12–15	4	75% pregnant and 25% postpartum	Persistent arrhythmia/ cardiogenic shock	V-A	100	50
3,16–26	48	70% pregnant and 30% postpartum	H1N1 ARDS	3 V-A and 45 V-V	92	74
27	1	Postpartum	Severe mitral regurgitation due to infective endocarditis	V-A	100	100
28	1	Postpartum	Takasubo's cardiomyopathy/ cardiogenic shock	V-A	100	100
29,30	2	50% pregnant and 50% postpartum	Pulmonary embolus/right ventricular failure	V-A	100	100
31,32	2	Postpartum	Postpartum cardiomyopathy/ cardiogenic shock	V-A	100	50
33	1	Pregnant	Staphylococcal ARDS	V-V	100	Unknown
21	1	Pregnant	Cardiac arrest/post-ACLS/CPR	V-A	100	0

CPR, Cardio-pulmonary resuscitation; ECLS, extracorporeal life support; ARDS, acute respiratory distress syndrome; V-A, veno-arterial; V-V, veno-venous.

Modern Use of Extracorporeal Life Support in Pregnancy and Postpartum
ASAIO J. 2015 Jan-Feb;61(1):110-4

Pregnancy is NOT considered a contraindication for ECLS

- Amniotic fluid embolism/ pulmonary embolism
- Severe ARDS
- Postpartum cardiogenic shock (ex. Peripartum cardiomyopathy)

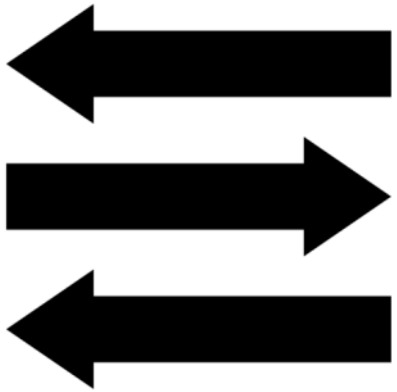
低葉克膜流速

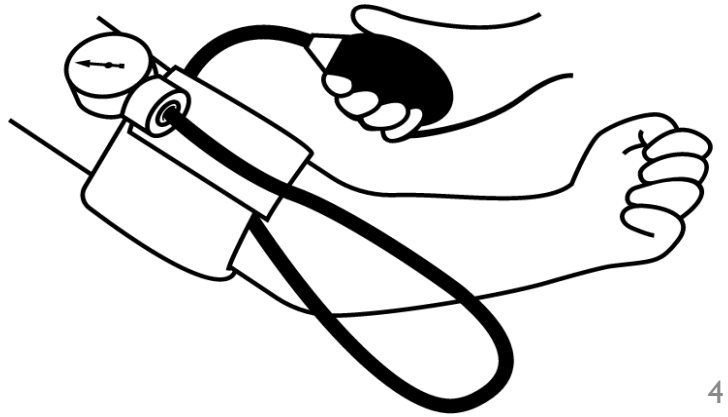
組織灌流

葉克膜流速

心臟輸出量

血壓





不使用抗凝血劑或維持低劑量使用

aPTT (seconds)
45.3
43.3
>200
45.5
>200

消耗性
凝血功能病變

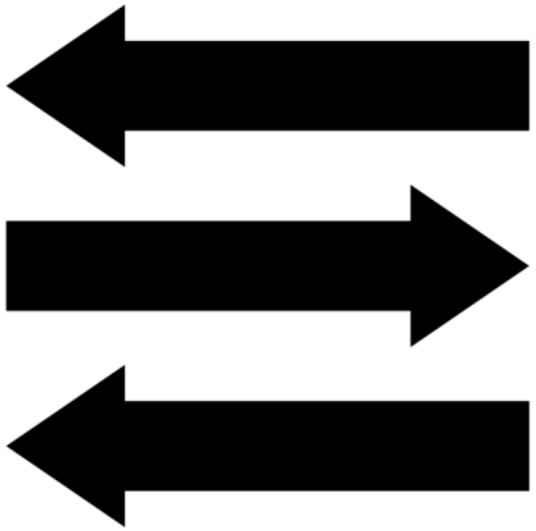
提早戒除葉克膜

產後病人
恢復快速

減低葉克膜
造成之併發症

葉克膜於產後大出血之應用
三大策略

低葉克膜流速



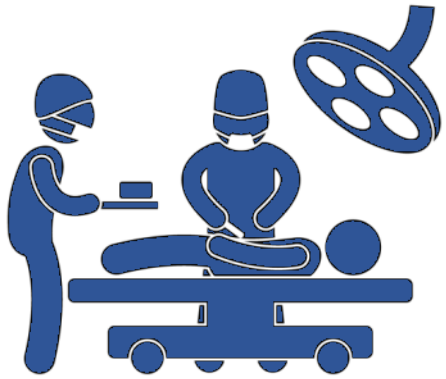
不使用抗凝血劑或
維持低劑量使用

提早戒除葉克膜

處置 - DIC

- Transfusion (pRBC: FFP: platelets = 1:1:1)
- Correct Hb (8~10 g/dl), Calcium supplement, Temperature correction, pH correction
- Tranexamic acid

- Factor VII
- TAE



嚴重產後大出血

初步急救
插管、中央靜脈導管、大量輸血

心臟代償失調

會診心臟外科醫師

<u>置入葉克膜導管並啟動葉克膜</u>

止血措施

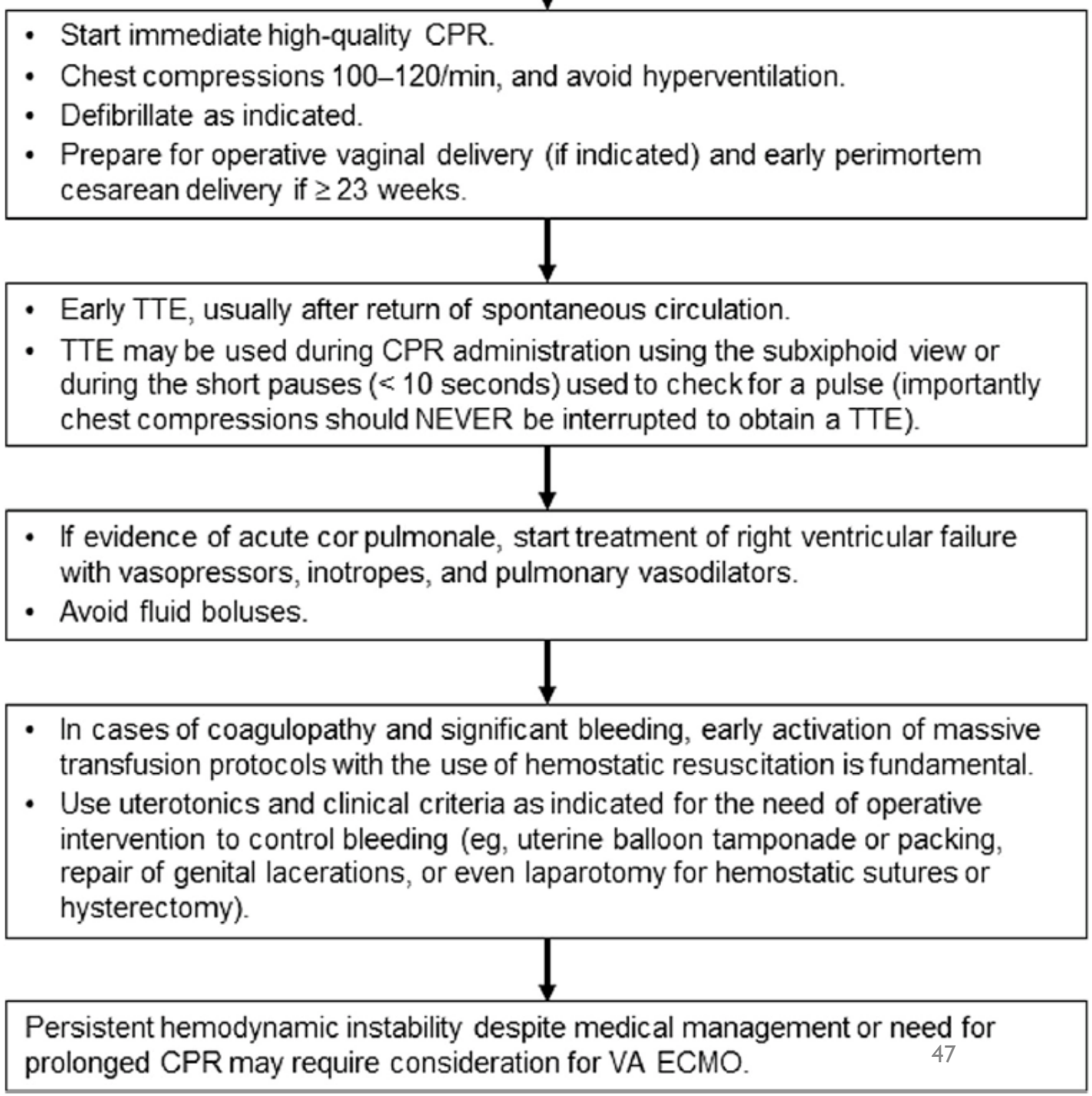
子宮收縮劑

體外或子宮腔加壓止血

血管栓塞術

切除子宮

羊水栓塞處理流程



Pacheco. Immediate management of amniotic fluid embolism. Am J Obstet Gynecol 2020.

Conclusion- **Chain of survival !**

台大 醫院
新竹分院

台大 醫院
NTUH

Thanks for Your Attention !