VI CONGRESSO NAZIONALE DI
ECOCARDIO
CHIRURGIA
MILANO 15-17 OTTOBRE 2012

Minicorso – Quando il gioco si fa duro… e la differenza tra l'esperto e il principiante può fare la differenza tra diagnosi tempestiva con possibilità di salvezza e diagnosi sbagliata con danni spesso irrimediabili

Come ricavare dall'eco in scopia elementi semplici ma determinanti nell'algoritmo della rianimazione

Dott Stefano Paglia PS/MURG/ 118

ALS

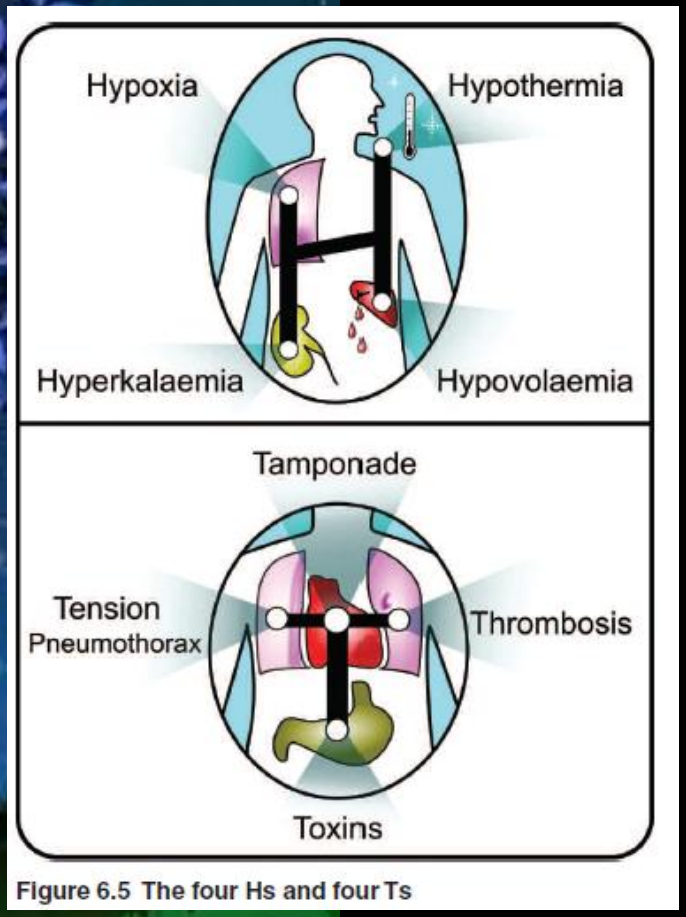


Figure 6.5 The four Hs and four Ts

Le cause reversibili

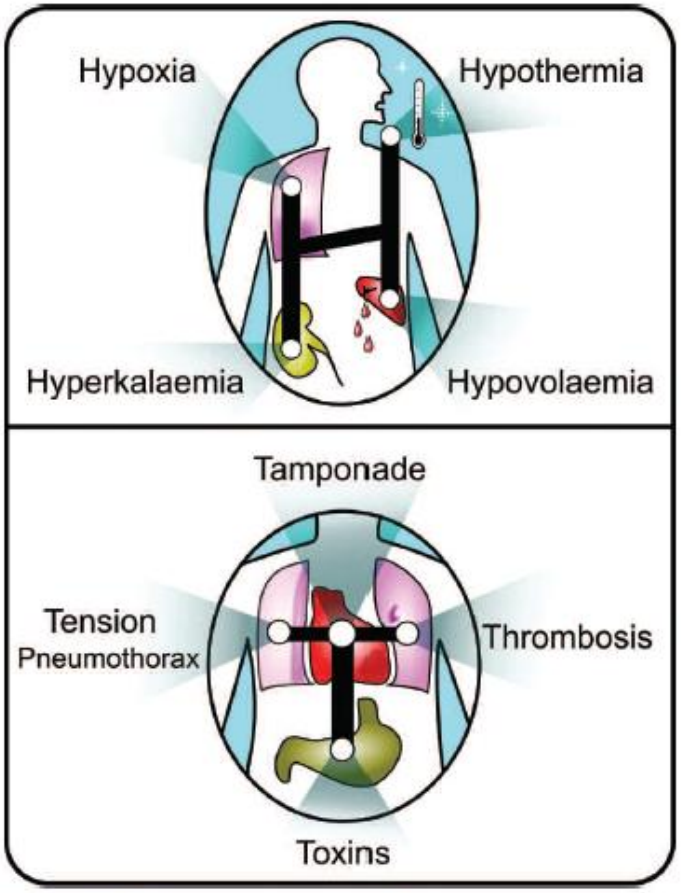


Figure 6.5 The four Hs and four Ts

Reversible Causes

- Hypoxia
- Hypovolaemia
- Hypo- / hyperkalaemia / metabolic
- Hypothermia

- Thrombosis - coronary or pulmonary
- Tamponade - cardiac
- Toxins
- Tension pneumothorax

TRATTAMENTO CAUSE REVERSIBILI

CONDIZIONE	TERAPIA	PROCEDURE
Ipovolemia	Riempimento volemico	Accesso vascolare
Ipotermia	Riscaldamento	Accesso vascolare Accesso a cavità corporee
Ipossia	Ossigenazione	Intubazione tracheale Ventilazione meccanica
Ioni alterati	Elettroliti e antidoti specifici	Accesso vascolare
Tossici	Elettroliti e antidoti specifici	Accesso vascolare
Tamponamento	Decompressione pericardica	Pericardiocentesi e drenaggio pericardico
Pnx iperteso	Decompressione pleurica	Drenaggio toracico
Tromboembolia **Trombosi coronarica**	Trombolisi	Accesso vascolare

Arresto cardiocircolatorio

Resuscitation 2000; 43: 221-3

Cause reveresibili	prevalenza	diagnosi Clinica ECG POC
Ipossia	alta	accurata
Ipovolemia	alta	variabile
Ipo-iperkaliemia	rara	accurata
Ipotermia	bassa	accurata
Tromboembolia polmonare	alta	inaccurata
Trombosi coronarica	Molto alta	variabile
Tamponamento cardiaco	rara	inaccurata
Tossici	rara	variabile
pneumotorace	bassa	accurata

DIAGNOSI di ARRESTO

- La valutazione clinica dei pazienti in sospetto arresto cardiorespiratorio è spesso inaccurata
- 19% FN (su manichino o simulazione) per diagnosi di arresto respiratorio, meno del 50% pone diagnosi in <10 sec
- In una popolazione con prevalenza di arresto cardiaco attorno al 50% quando un operatore sanitario esperto pone diagnosi di ACC la probabilità che sia realmente in arresto è stimabile tra il 75% e l'85% (VPP)
- Quando l'operatore esperto rileva attività respiratoria o cardiaca la probabilità che il paziente non sia in arresto è stimabile tra il 98% e il 100% (VPN)

DIAGNOSI di ARRESTO

- In altri termini la diagnosi clinica di arresto cardiaco è sbagliata nel 20% dei casi (FP) mentre la diagnosi di assenza di arresto è sbagliata al massimo nel 2% dei casi (FN)

- In circa 50% dei casi di PEA (definiti clinicamente) sono rilevabili
  - onda sfigmica con monitoraggio pressorio cruento
  - flusso endoarterioso all'analisi Doppler

Qualcosa di nuovo

Use of ultrasound during advanced life support

In skilled hands, ultrasound can be useful for the detection of potentially reversible causes of cardiac arrest (e.g. cardiac tamponade, pulmonary embolism, ischaemia (regional wall motion abnormality), aortic dissection, hypovolaemia, pneumothorax). The integration of ultrasound into advanced life support requires considerable training if interruptions to chest compressions are to be minimised. A sub-xiphoid probe position is recommended (Fig 6.6). Placement of the probe just before chest compressions are paused for a planned rhythm assessment enables a well-trained operator to obtain views within 10 s. The Focused Echocardiography Extended Life Support Course (FEEL-UK) provides a valuable introduction to echocardiography in this setting.

Figure 6.6 Use of ultrasound during advanced life support

Focused echocardiographic evaluation in resuscitation management: Concept of an advanced life support–conformed algorithm

Raoul Breitkreutz, MD; Felix Walcher, MD, PhD; Florian H. Seeger, MD

Table 1. Focused Echocardiographic Evaluation in Resuscitation (FEER) management examination in ten steps[a]

Phase	Step with Command, Element
High-quality CPR, preparation, team information	*1) Perform* immediate and accurate BLS and ACLS according to AHA/ERC/ILCOR guidelines, at least five cycles of chest compression/ventilation
	2) Tell the CPR team: "I am preparing an echocardiogram"
	3) Prepare portable ultrasound (let prepare) and *test* it
	4) Accommodate situation (e.g., best position of patient and doctor, removal of clothes), be ready to start
Execution, obtaining the echocardiogram	*5) Tell* CPR Team to count down 10 secs and to undertake a pulse check simultaneously
	6) Command: "Interrupt at the end of this cycle for echocardiography"
	7) Put the probe gently onto the patients subxiphoidal region during chest compressions
	8) Perform a subcostal (long axis) echocardiogram as quickly as possible. If you cannot identify the heart after 3 secs, stop the interruption and repeat again five cycles later and/or with the parasternal approach.
Resuming CPR	*9) Command* after 9 secs at the latest: "Continue CPR" and control it
Interpretation and consequences	*10) Communicate* (after continuation of chest compressions only) the findings to the CPR team (e.g. wall motion, heart is squeezing, cardiac stand still, (massive) pericardial effusion, no conclusive finding, suspected pulmonary artery embolism, hypovolemia) and *explain* consequences and follow-up procedure

Summary and Conclusions

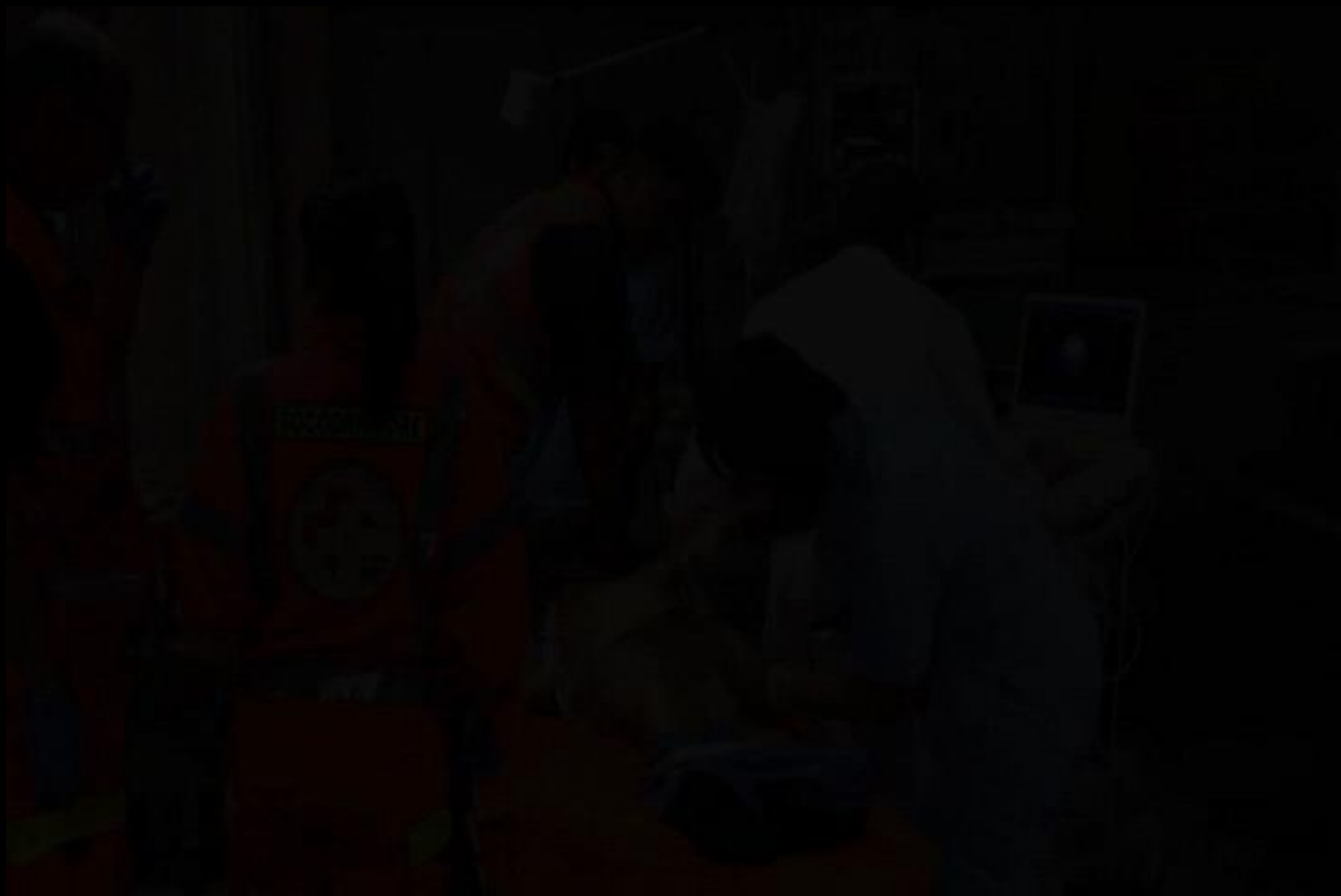
Because of the diagnostic pressure during CPR to identify and treat reversible causes, there is a demand for a structured process when using echocardiography. The simple FEER examination mainly enables an ALS-conformed algorithm to assess myocardial wall motion with the educated eye parallel to brief pauses of CPR within a few seconds. FEER may differentiate PEA and identify pericardial effusion without a major prolongation of the NFIs. Thus, it is suggested as an extension to standard advanced cardiac life support interventions. Educational training for the FEER examination is essential by theoretical and practical means and can be learned in an 8-hr course by nonexpert sonographers.

“L’avvocato del diavolo”

- Entro 10 secondi e durante RCP.

  Ma stiamo scherzando?
- Si può imparare ad usare l’eco in 8 ore a 40 anni dopo che se ne è sempre fatto a meno?
- Si può veramente fare?
- Mane vale veramente la pena?

Si può fare?

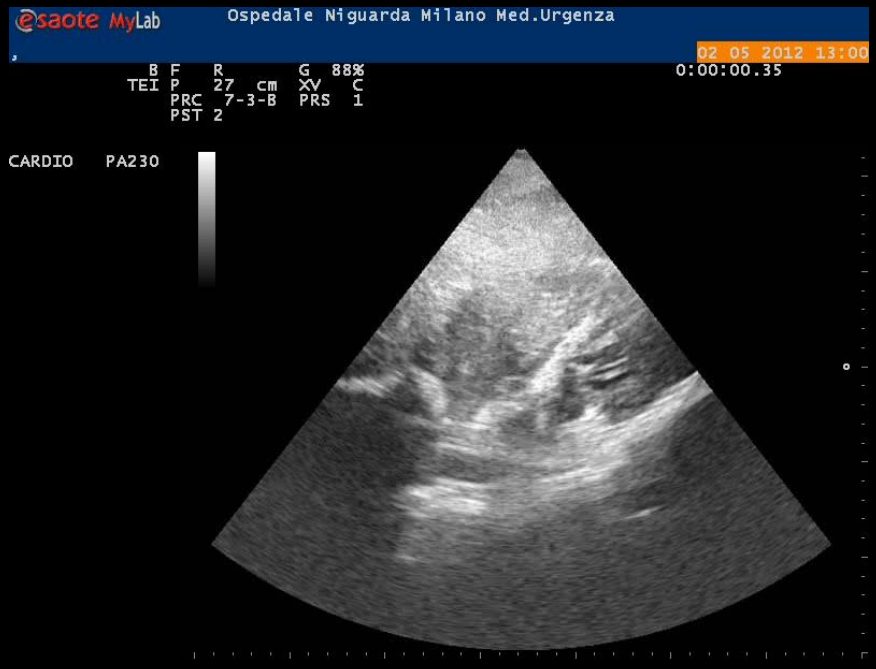


Si può fare?


esaote MyLab
Ospedale Niguarda Milano Med.Urgenza
02 05 2012 12:56
B F R G 88%
TEI P 27 cm XV C
PRC 7-3-B PRS 1
PST 2
0:00:00.50
CARDIO PA230

Premesse fondamantali

- Parliamo di quadri clinici eclatanti, tanto da determinare Arresto cardiocircolatorio
- Parliamo di “cose grosse”



FASTCRASH SIMEU

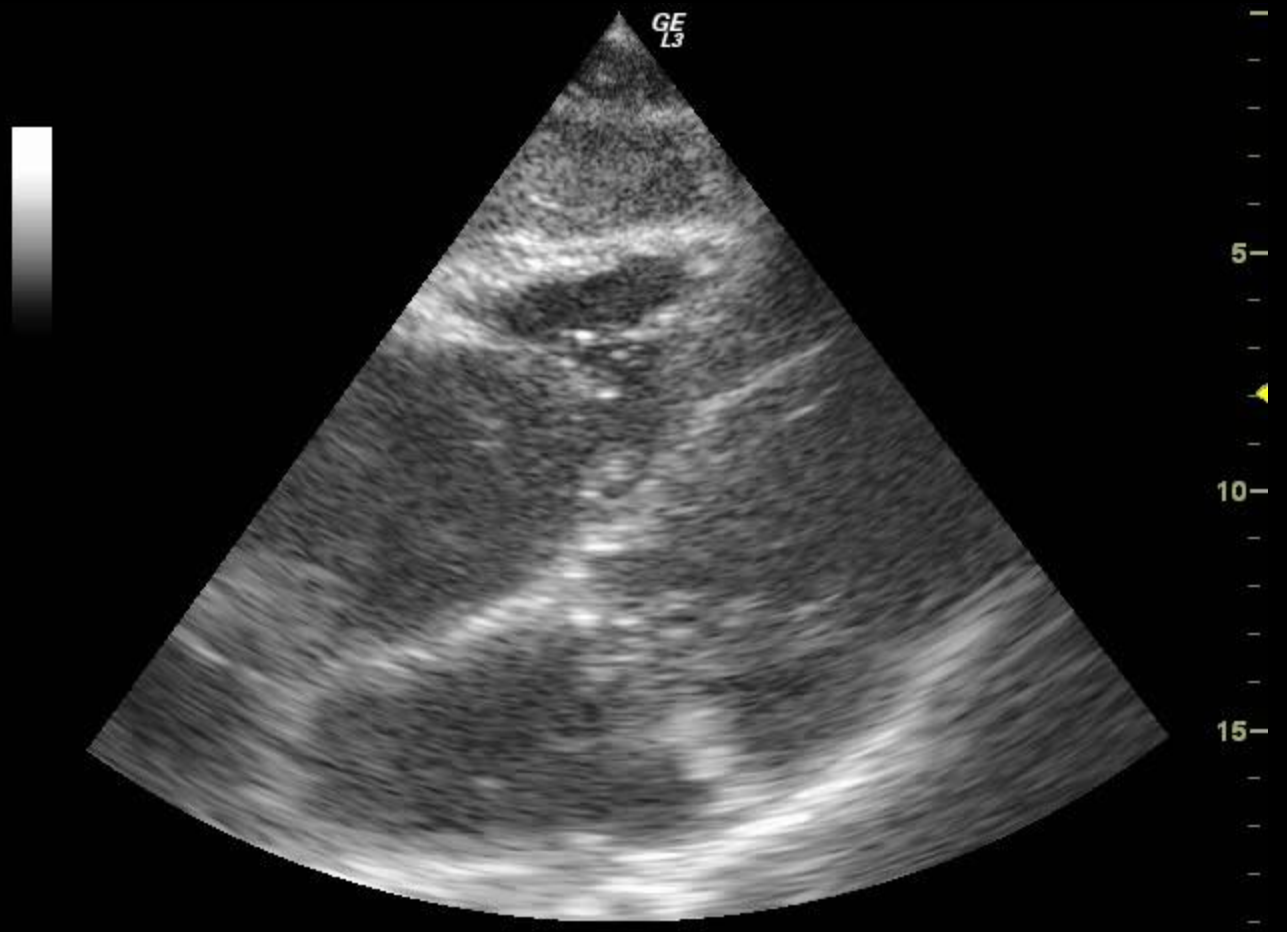
PEA - asistolia - FV/TV refrattaria

ABCD 1 e 2

ECOcuore

CAVITA' NORMALI/RIDOTTE	VS VD DILATATI	VERSAMENTO PERICARDICO
Considerare IPOVOLEMIA / PNX	TROMBOEMBOLIA	TAMPONAMENTO
ECOtorace → fluido in pleura	ECOvene → TVP	
ECOaddome → fluido in peritoneo, AAA		
drenaggio pleurico (ECOt)	riperfusione	drenaggio pericardico (ECOc)
chirurgia in emergenza	accesso venoso ⇨ fluidi e farmaci e.v. (ECOv)	

Ne vale la pena?



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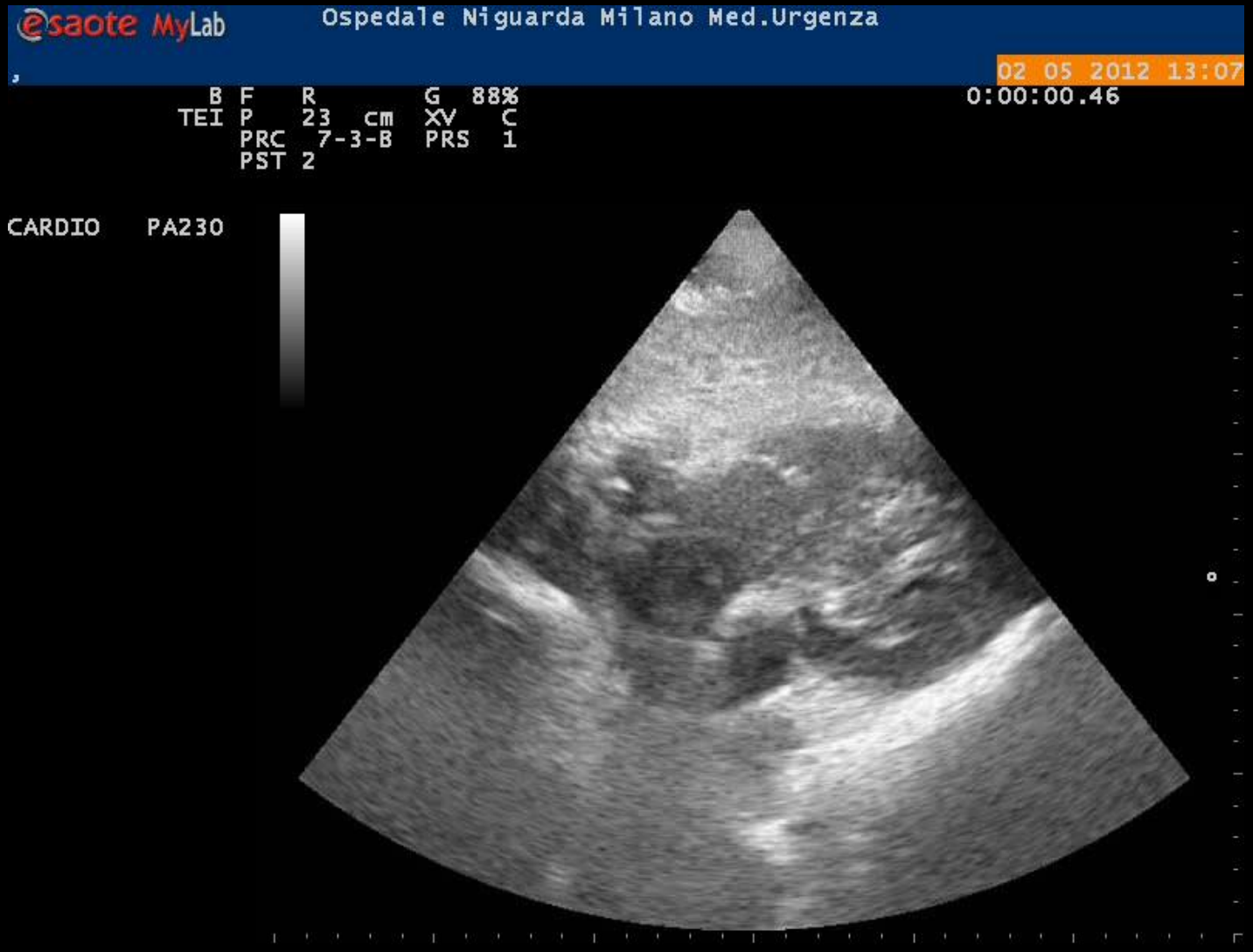

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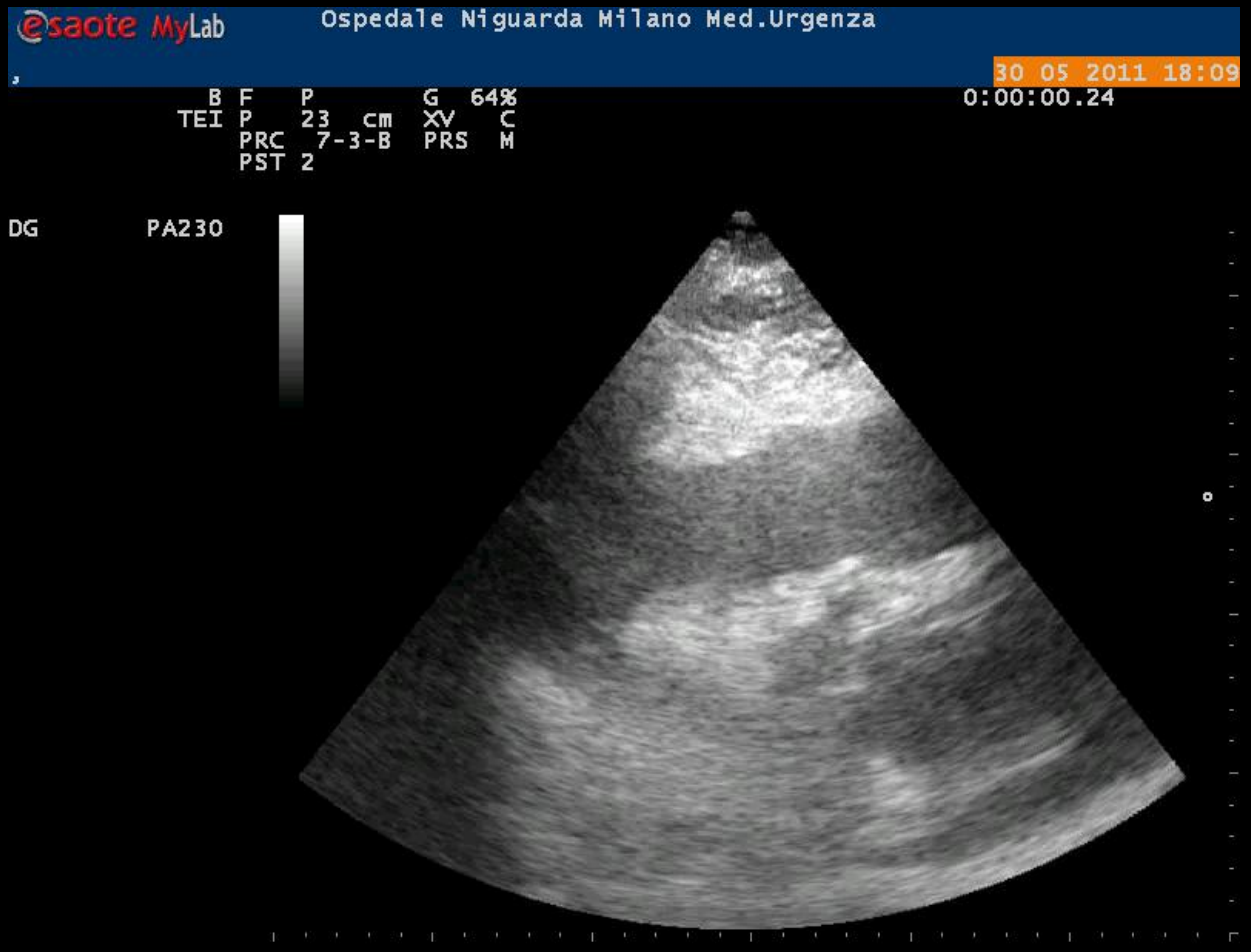

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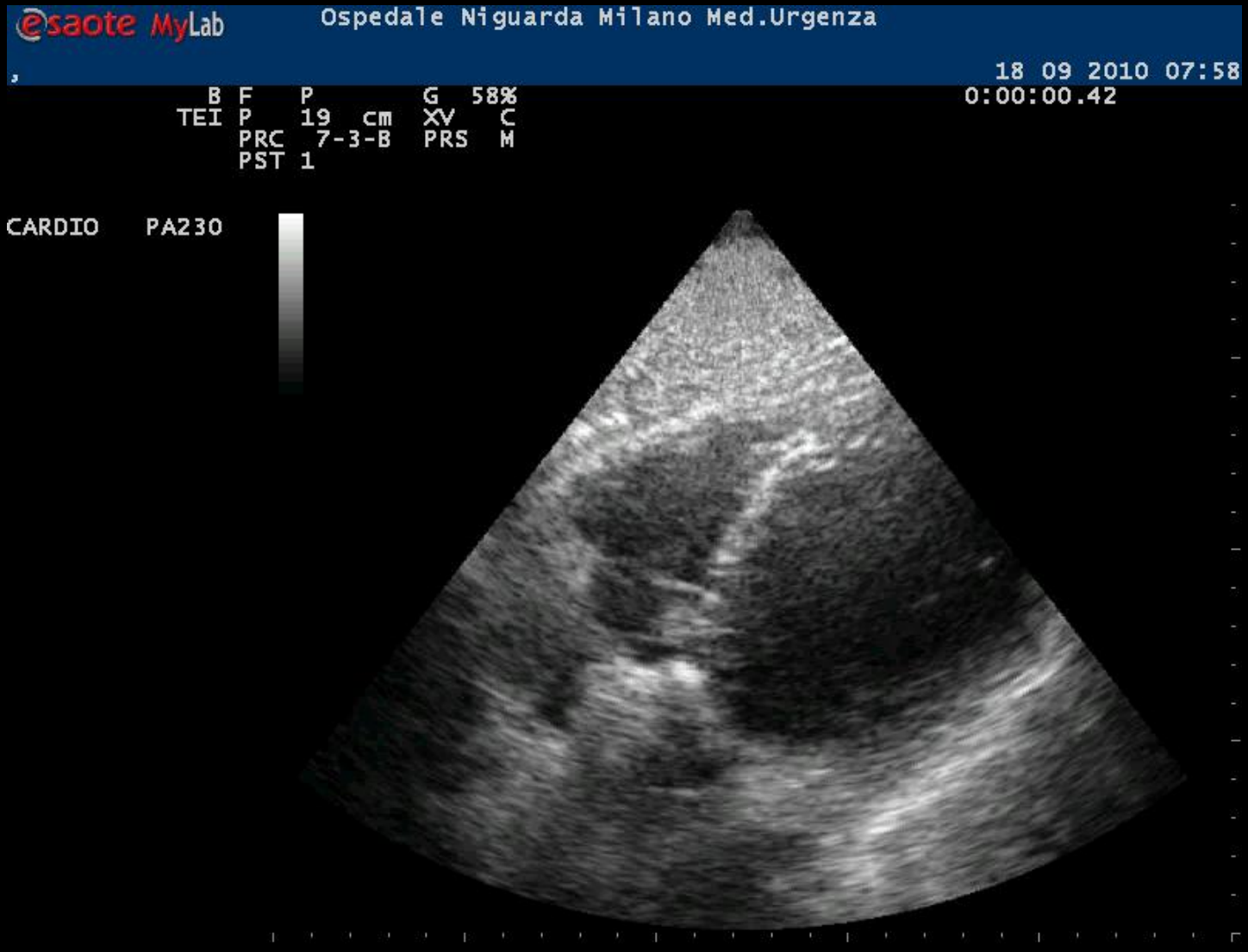

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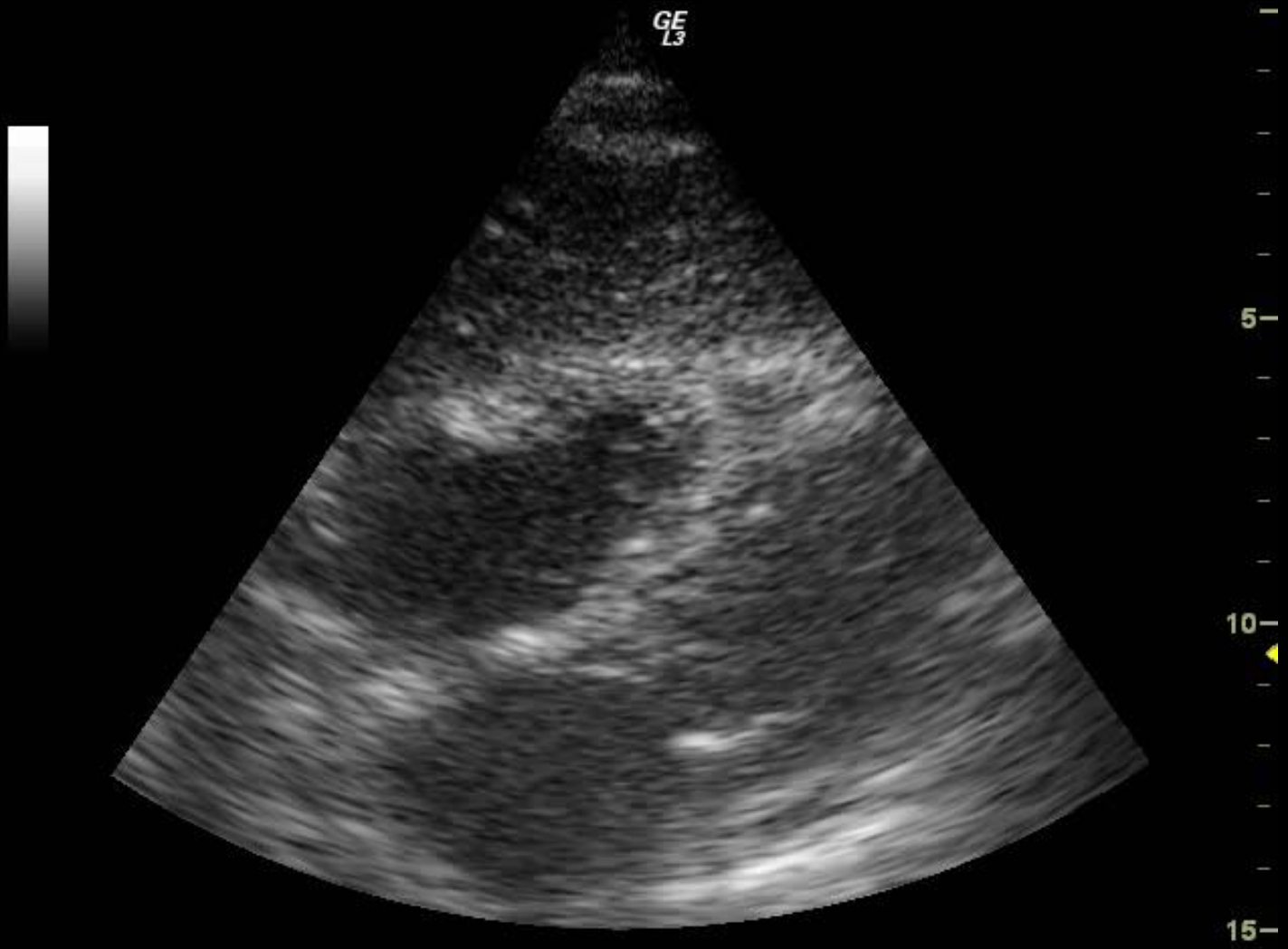

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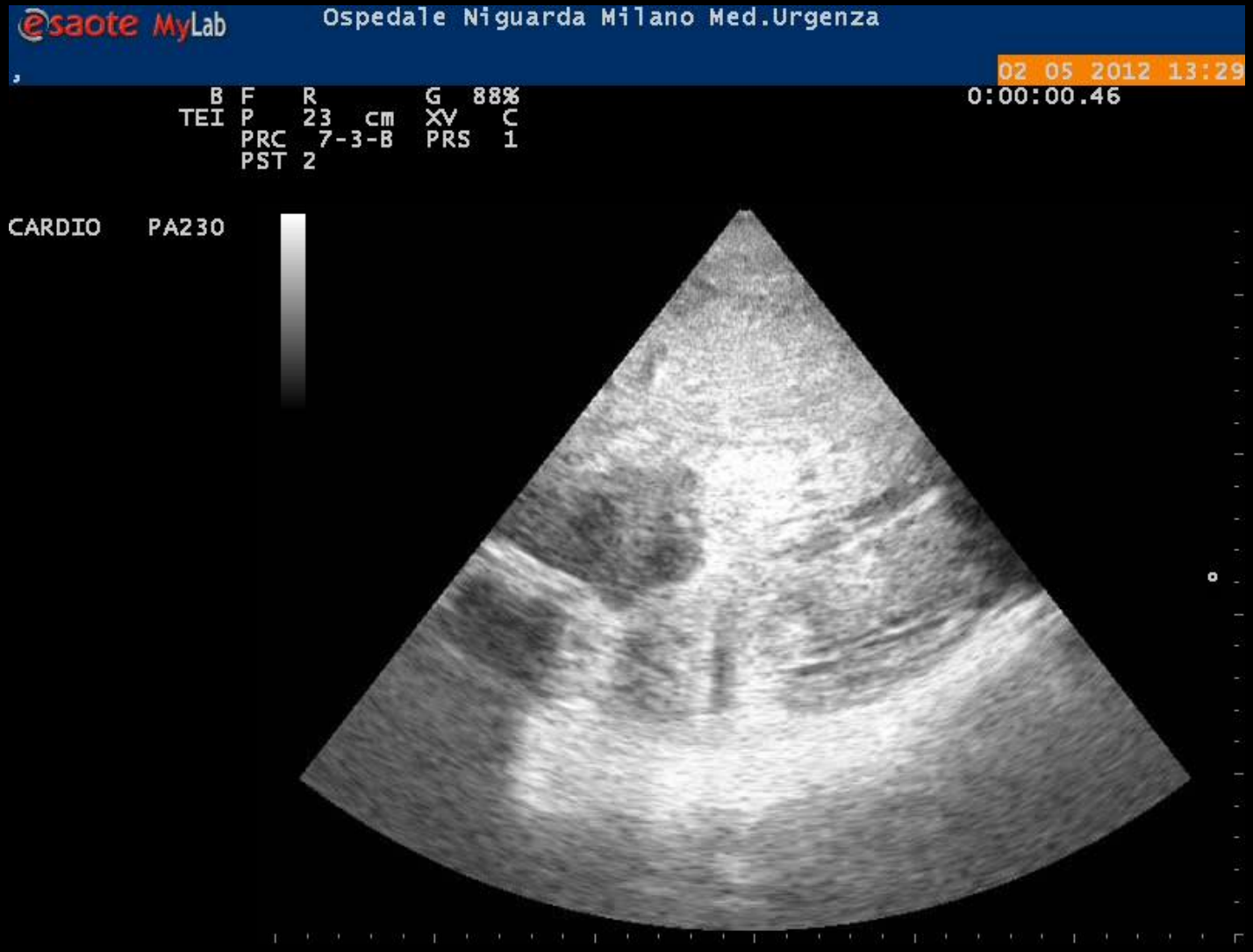

Take home message

C.A.U.S.E.: Cardiac arrest ultra-sound exam—A better approach to managing patients in primary non-arrhythmogenic cardiac arrest☆

Caleb Hernandez[a], Klaus Shuler[a], Hashibul Hannan[a], Chionesu Sonyika[a], Antonios Likourezos[a,*], John Marshall[a,b]

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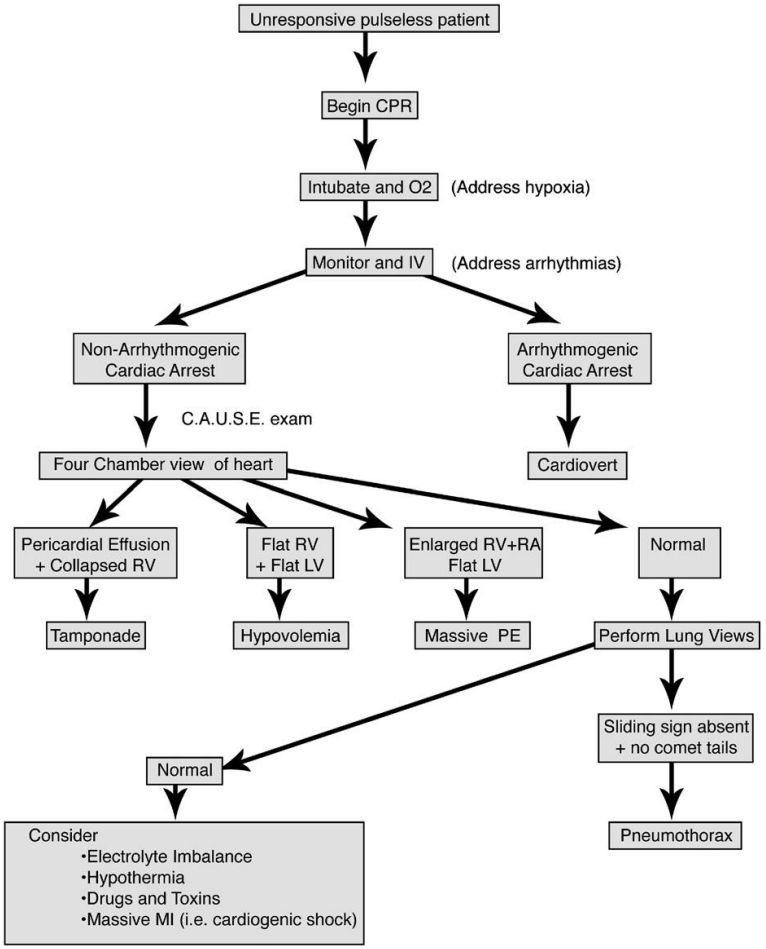


In conclusion, this protocol has the potential to reduce the time required to determine the etiology of a cardiac arrest and thus decrease the time between arrest and appropriate therapy.

Outcome in Cardiac Arrest Patients Found to Have Cardiac Standstill on the Bedside Emergency Department Echocardiogram

MICHAEL BLAIVAS, MD, JOHN CHRISTIAN FOX, MD

TABLE 2. Survival to Leave the Emergency Department for Patients Based on Initial Rhythm and Echocardiographic Findings*

	Electrocardiographic Asystole & Sandstill	PEA & Standstill	PEA & Contractions	VF & Standstill	VF & Contractions
Survived	0	0	12 (67%)	0	8 (53%)
Died	65 (100%)	20 (100%)	6 (33%)	51 (100%)	7 (47%)

*Standstill = sonographic asystole; PEA = pulseless electrical activity; contractions = mechanical contractions on echocardiogram; VF = ventricular fibrillation.

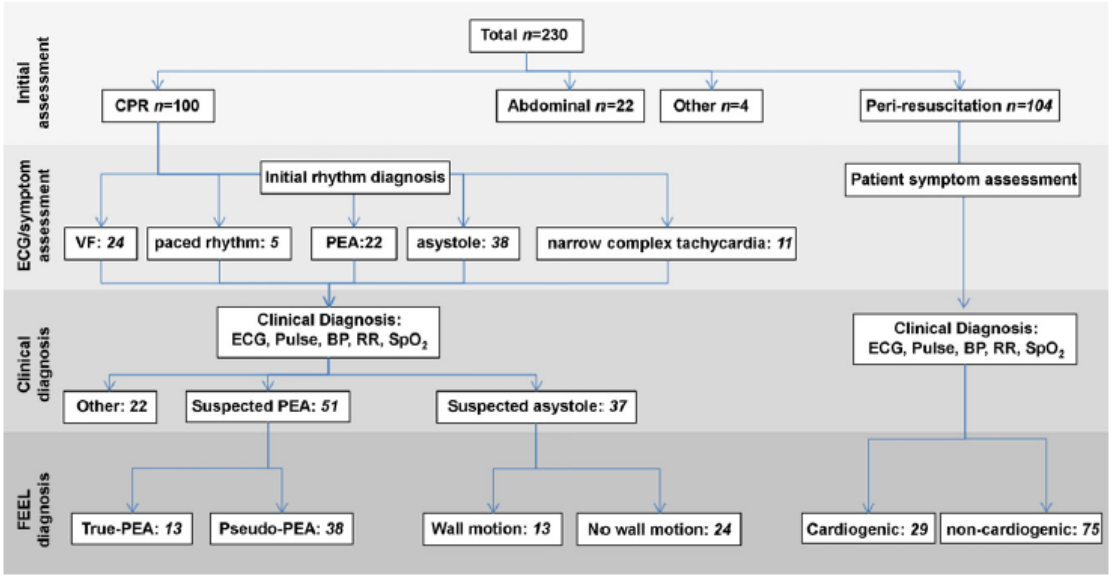
CONCLUSIONS

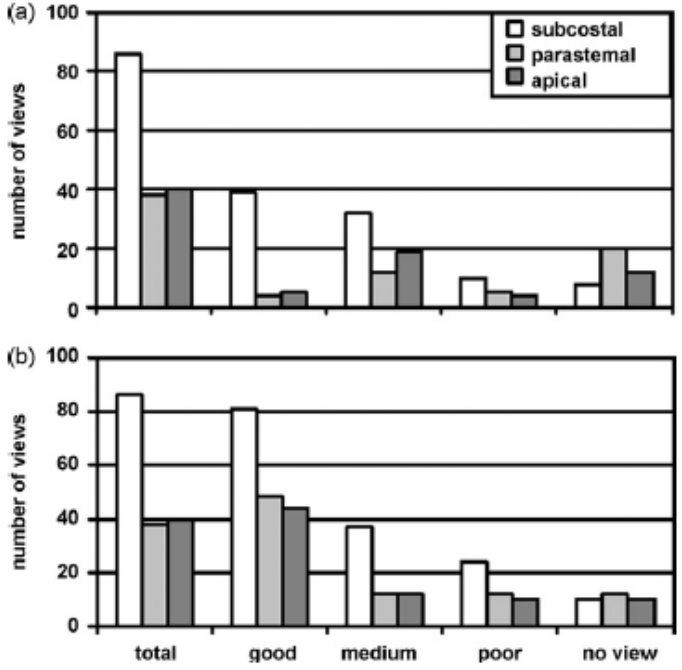
In this study, patients presenting to the ED with cardiac standstill on bedside emergency ultrasound uniformly did not survive to leave the ED regardless of initial electrical rhythm on monitor or resuscitative efforts. These data suggest that resuscitation efforts may be halted early when cardiac standstill is seen on echocardiogram in arriving cardiac arrest patients. However, before any widespread alteration of clinical practice should be considered, larger studies are needed.

FEEL

Resuscitation 81 (2010) 1527–1533

Focused echocardiographic evaluation in life support and peri-resuscitation of emergency patients: A prospective trial☆,☆☆





Pre-FEEL diagnosis	Post-FEEL diagnosis	Survived to admission	Died on scene
Suspected PEA (n = 51)	–	22 (43%)	29 (57%)
	Pseudo-PEA (n = 38) (wall motion present)	21/38 (55%)	17/38 (45%)
	True-PEA (n = 13) (no wall motion present)	1/13 (8%)	12/13 (92%)
Suspected asystole (n = 37)	–	13/37 (35%)	24/37 (65%)
	Wall motion present (n = 13)	9/37 (24%)	4/37 (11%)
	No wall motion present (n = 24)	4/37 (11%)	20/37 (54%)
Pooled suspected PEA and asystole (n = 88)	–	35/88 (40%)	53/88 (60%)
	Wall motion present	30 (34%)	21 (24%)
	No wall motion present	5 (6%)	32 (36%)

FEEL

Focused echocardiographic evaluation in life support and peri-resuscitation of emergency patients: A prospective trial☆,☆☆

A B S T R A C T

Purpose of the study: Focused ultrasound is increasingly used in the emergency setting, with an ALS-compliant focused echocardiography algorithm proposed as an adjunct in peri-resuscitation care (FEEL). The purpose of this study was to evaluate the feasibility of FEEL in pre-hospital resuscitation, the incidence of potentially treatable conditions detected, and the influence on patient management.

Patients, materials and methods: A prospective observational study in a pre-hospital emergency setting in patients actively undergoing cardio-pulmonary resuscitation or in a shock state. The FEEL protocol was applied by trained emergency doctors, following which a standardised report sheet was completed, including echo findings and any echo-directed change in management. These reports were then analysed independently.

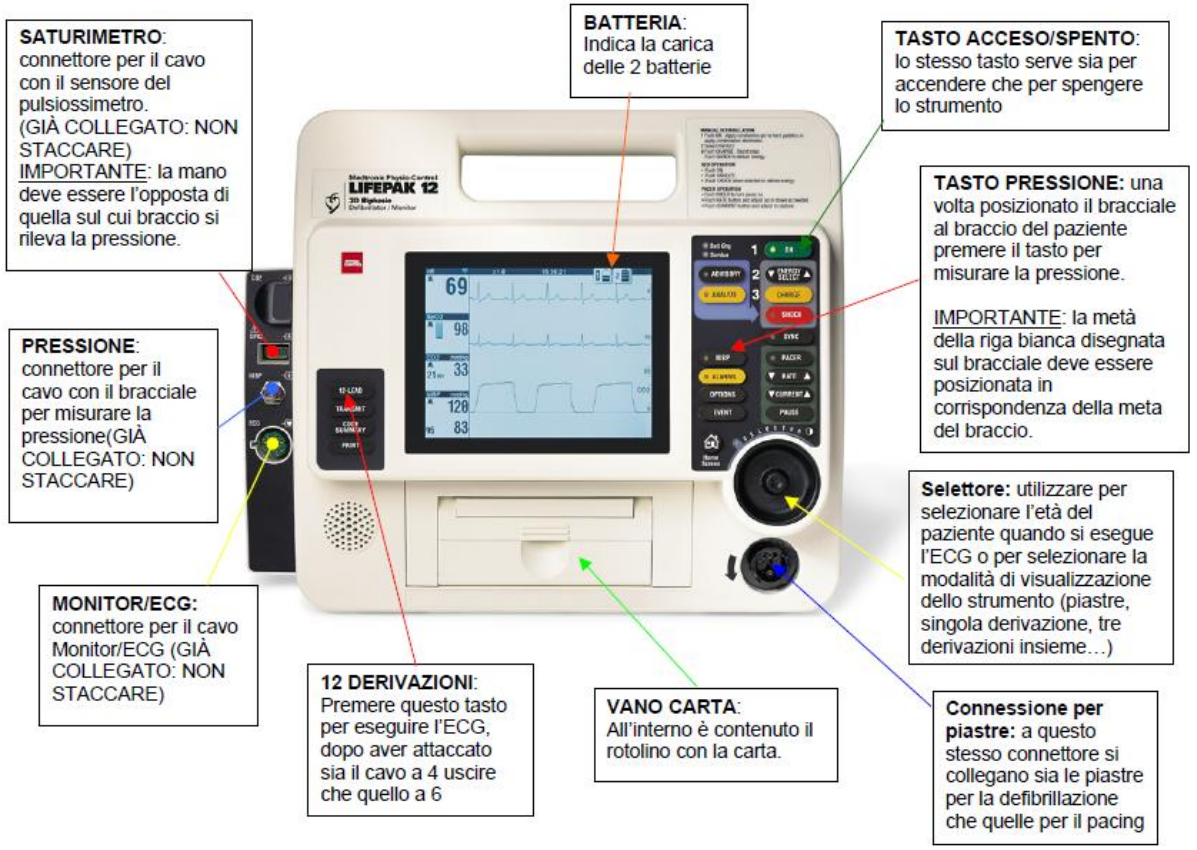
Results: A total of 230 patients were included, with 204 undergoing a FEEL examination during ongoing cardiac arrest (100) and in a shock state (104). Images of diagnostic quality were obtained in 96%. In 35% of those with an ECG diagnosis of asystole, and 58% of those with PEA, coordinated cardiac motion was detected, and associated with increased survival. Echocardiographic findings altered management in 78% of cases.

Conclusions: Application of ALS-compliant echocardiography in pre-hospital care is feasible, and alters diagnosis and management in a significant number of patients. Further research into its effect on patient outcomes is warranted.

Il peso delle parole

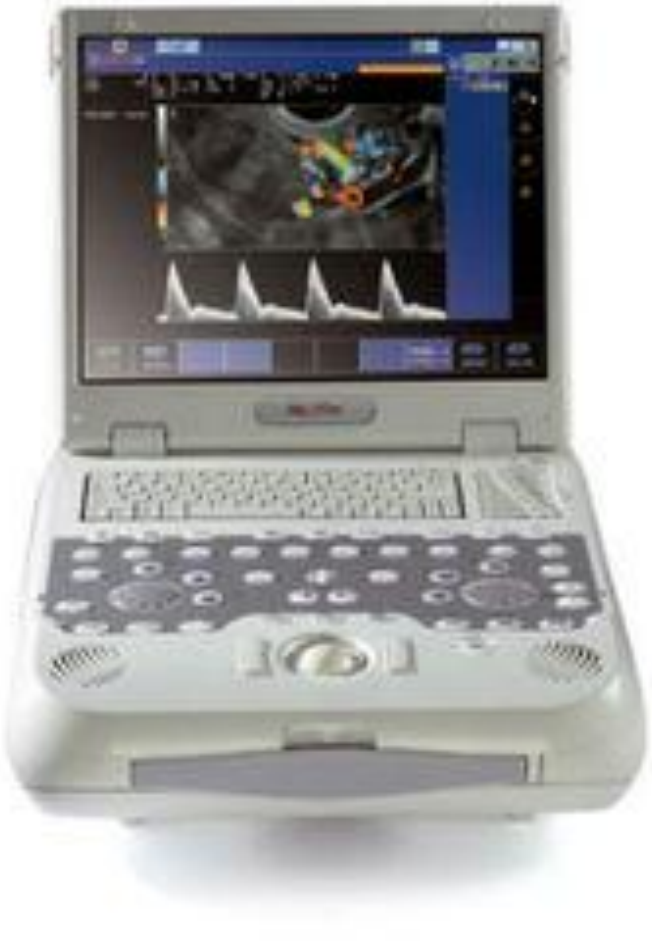
- *“In skilled hands, ultrasound can be useful for the detectionof potentially reversible causes of cardiac arrest…”*
- Queste poche righe sanciscono di fatto l’ingresso di un nuovo strumento nella sequenza ALS per i ritmi non defibrillabili.
- Non una nuova terapia
- **Un nuovo strumento**

Questo strumento abbiamo imparato ad usarlo…



forse

E se imparassimo ad usare in tutti i ritmi non defibrillabili anche questo?



Take home message

Domande?

Grazie per l’attenzione