# Echo training for intensivists in France ?

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# ESICM 2002

*Echocardiography in ICU in Enrope*

- 144 european ICUs (universitaires : 74%)
- Type : medical and surgical (63%), surgical (22%), médical ICUs (9%), pédiatric(6%)
- Permanent acces to echocardiography : 66% des cas
- Echo machine in the ICU : 49% (75% médical)
- TEE performed in 82% of ICUs
- < 10 exams / week in 48% of cases
  > 20 exams/ week in 9% of cases

# ESICM 2002

Who performs echo examinations in ICUS ?

| | TTE | TEE |
|---|---|---|
| Cardiologist | 54% | 46% |
| Intensivist | 59% | 39% |

- Certification : 20% of medical staff
- Certification accessibility : 26% of institutions
- Writing procedure : 16%.

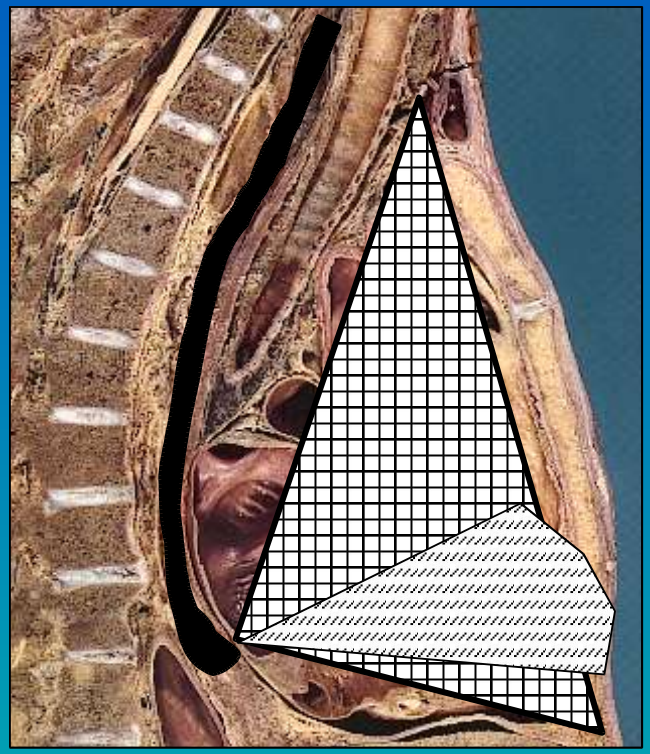
# Echo training for intensivists in France?

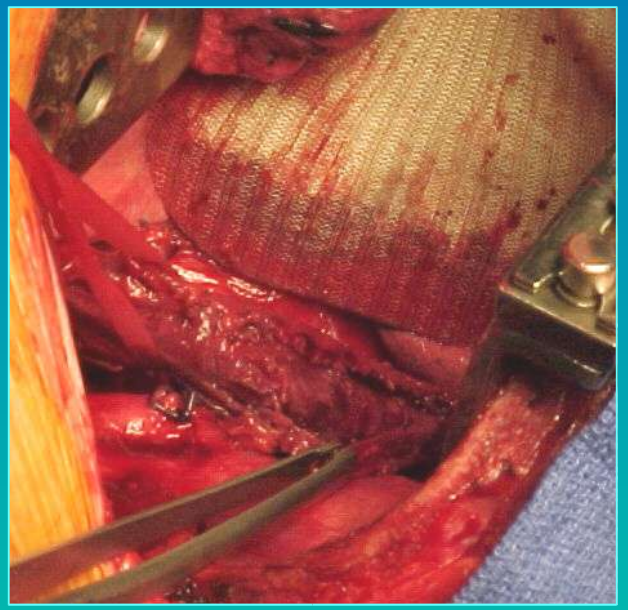
- Why learning echocardiography ?
- How ?

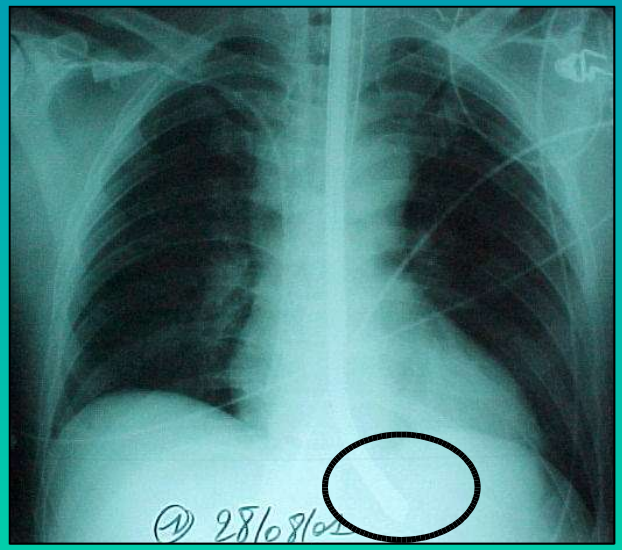
# Why ?

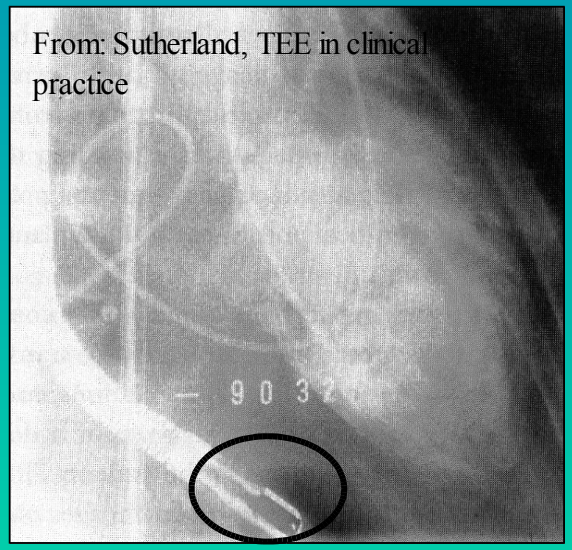
- Examination
  - Complications (TTE)
  - To get hemodynamic information
  - To interprete recorded parameters
- High impact of TEE and TTE in ICUs
- To have skills in performing TTE and TEE in emergency rooms and in ICUs
- Consequences of echographic diagnosis

# Esophageal perforation








1 death / 10218 pts

Daniel et al. Circulation 1991;83:817-21

# Which training for intensivists?

- Why ?
- How ?

# French recommandations*

1994

« La Filiale d'échocardiographie de la Société Française de Cardiologie recommande que la pratique de l'échocardiographie soit assurée **par les seuls cardiologues**. » (only cardiologists!!)

« Il existe des exceptions qui concernent les modes d'utilisation particuliers de l'échocardiographie. »

« … aspect très particulier et limité de la technique, **à l'exclusion de l'échocardiographie diagnostique** (par exemple le monitorage de la fonction ventriculaire gauche par voie oesophagienne par un anesthésiste ou l'échocardiographie épicardique peropératoire par un chirurgien cardiaque). » anesthesiologists for monitoring only and not for diagnosis!

*: R. Roudaut et al. *Arch Mal Cœur* 1994 ; 87 : 791-8 adapté d'après :
Pearlman AS et al. *Am J Cardiol* 1987 ; 60 : 158-63
Popp RL et al. *J Am Coll Cardiol* 1990 ; 15 : 1465-8.

| Levels | Skills | Duration of training | Number of examinations |
|---|---|---|---|
| 1 | TTE (introduction) | 3 months or 60 half days training | 120 TTE |
| 2a | TTE, introduction to TEE | 3 months or 60 half days training | 120 TTE |
| 2b | TTE<br>TEE | 3 months or 60 half days training | 60 TTE and 60 TEE |
| 3 | Lab director | | |

# Training in USA*

- **Interprétation only**

**Table 1** Published guidelines for minimum training in echocardiography for physicians

TTE

| Training level | Cardiac echocardiographic and Doppler studies (total no.) | Time (mo) | Competence |
|---|---|---|---|
| 1 | 150 | 3 | Basic, educated consumer |
| 2 | 300 | 6 | Competent reader |
| 3 | 750 | 12 | Laboratory director |

*: Task force of ASE; *J Am Soc Echocardiogr* 1999 ; 12 : 82-4

# Training: american recommandations*

diagnosis in pericardial tamponade and electromechanic dissociation, which represent truly emergent and potentially lethal cardiovascular conditions. *However, even these apparently straightforward conditions may be misdiagnosed or misinterpreted by persons who have insufficient training. Cardiac ultrasonography, even for "quick look" or "limited" examinations, requires substantial training to avoid diagnostic errors.* Furthermore, these diagnoses and others often demand immediate, and fre-

be limited to unavoidable emergent circumstances with a potentially lethal condition. The usual criteria for competence and expertise justifiably can be softened if the patient's needs are better met through an immediate interpretation of an echocardiogram by someone with limited experience than through a delayed interpretation by someone with more echocardiographic expertise. We expect that such situations will be unusual, and the urgency should be

*: Task force of ASE; *J Am Soc Echocardiogr* 1999 ; 12 : 82-4

# Objectives

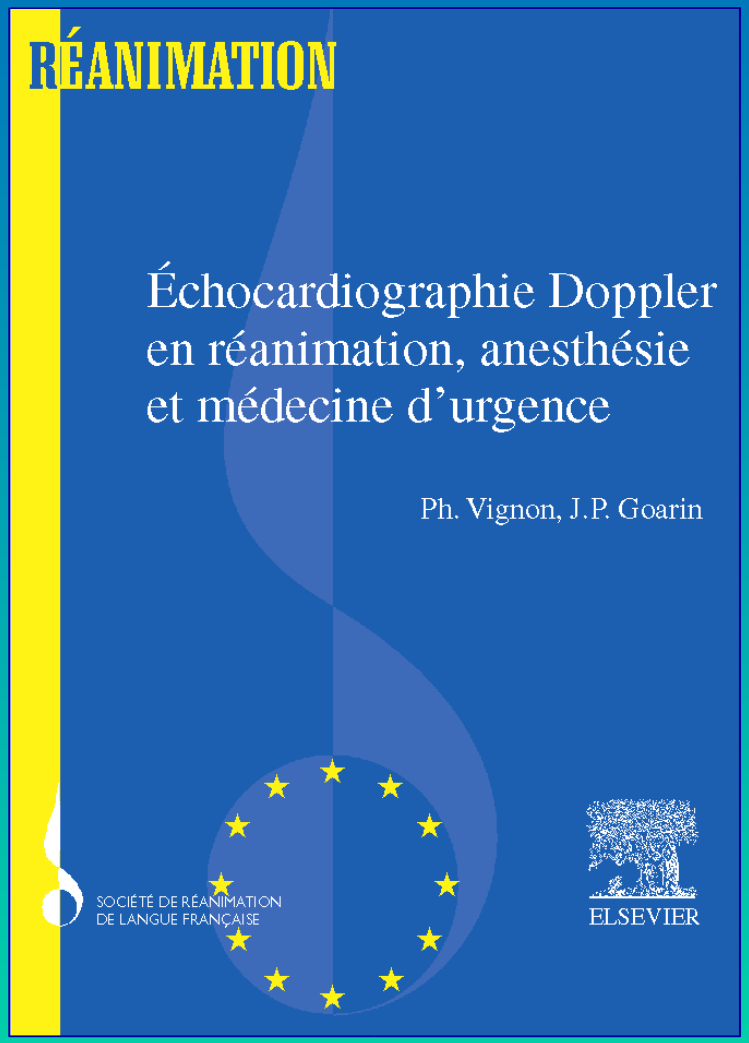
Hemodynamical technique

Curriculum Modification

- Examination and interpretation
- Skills for TTE and introduction to TEE
- Coopération with cardiologists +++

# 2004-2005 : modifications of certification

- **First year with cardiologists**
- **Second year with specific course and specific training in ICU and surgical departements**
- Cooperation between french society of medical intensive care (SRLF), anaesthesiolgy and surgical intensive care (SFAR) and french society of cardiology (SFC)
- Started in 2004.



# Echo training for intensivists in France?

## Courses

- Specific course on emergency and critical clinical situations (shock, ARDS)
- Commun course with cardiologists
- Evaluation organized by intensivists

## Training

- Accreditation of intensive care unit
- Conditions :
  - Expérience echo in ICU
  - Certified medical staff
  - Specific echo machine inside ICU
- Student evaluation book
  - All examinations
  - ≥ 25 oesophageal insertions and ≥ 50 TEE as helper
  - Kind of seen pathology

# Courses

## Commun

- Right ventricule and PAP
- LV diastolic function
- LV systolic function and afterload
- Trauma
- Valvular emergency
- Pulmonary embolism
- TEE during cardiac surgery
- TEE during non cardiac surgery

## Specific

- Echocardiography and respiratory and cardiac interaction
- Preload
- Septic shock
- Cardiogenic shock
- Shock after cardiac surgery
- Pulmonary edema and ARDS

# Which training for intensivists ?

Limitations

- Long
- Skills for simple diagnosis
- Price of echo machines

Rapid examination for screening

In evaluation

- Understanding of echo examination conclusions and discussion with cardiologists
- Diagnosis of simple and typical clinical situations

# Minimal skills for screening examination

- Few cardiac views
- Limited number of questions
- Bimodal answer (yes or not)
- No quantification
- Training on stable patients

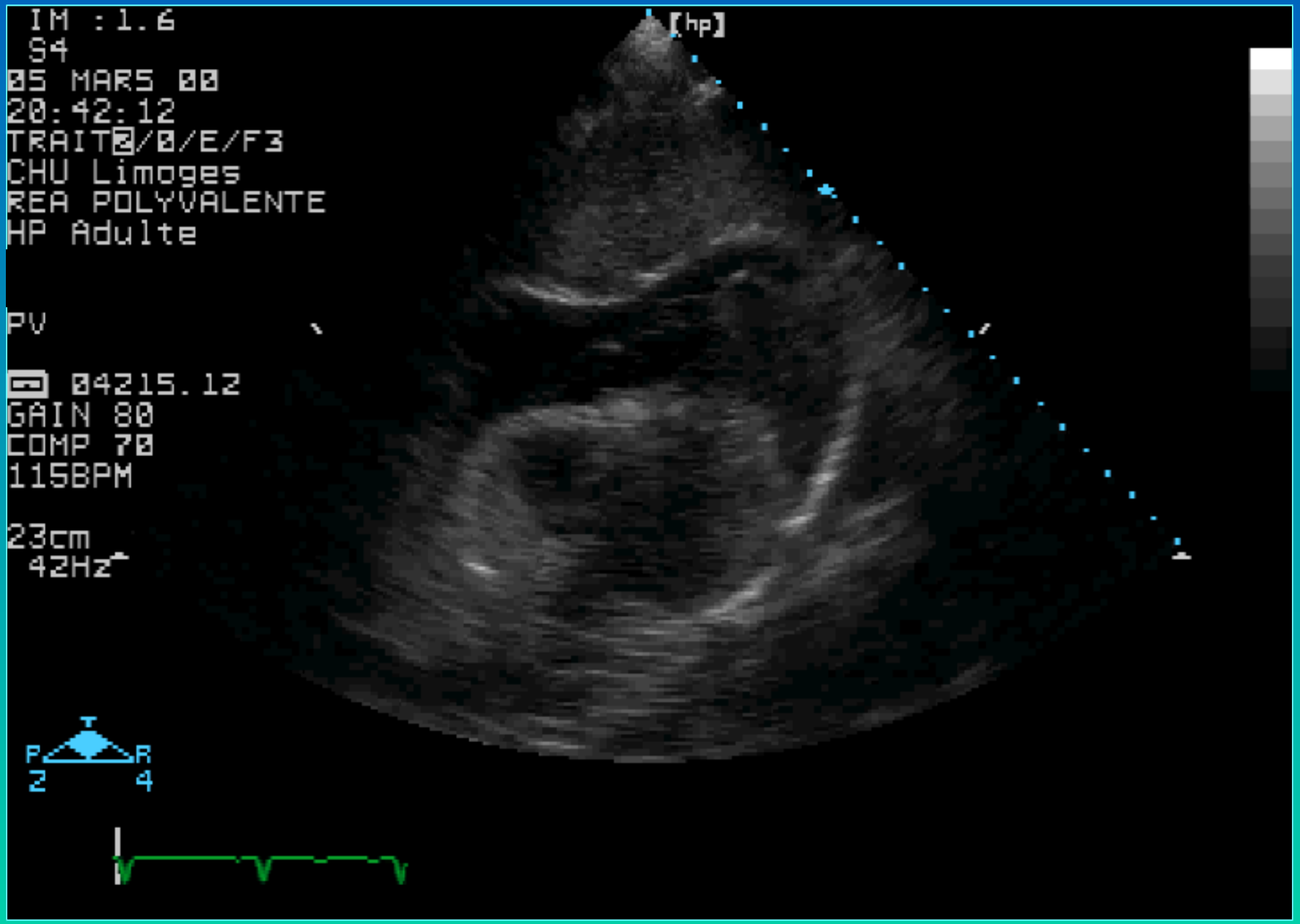
1 – LV systolic function ?

2 – Pericardial effusion ? Pericardial tamponade ?

3 – Dilation of RV ?

4 – Size and respiratory variations of IVC ?

5 – Pleural effusion ?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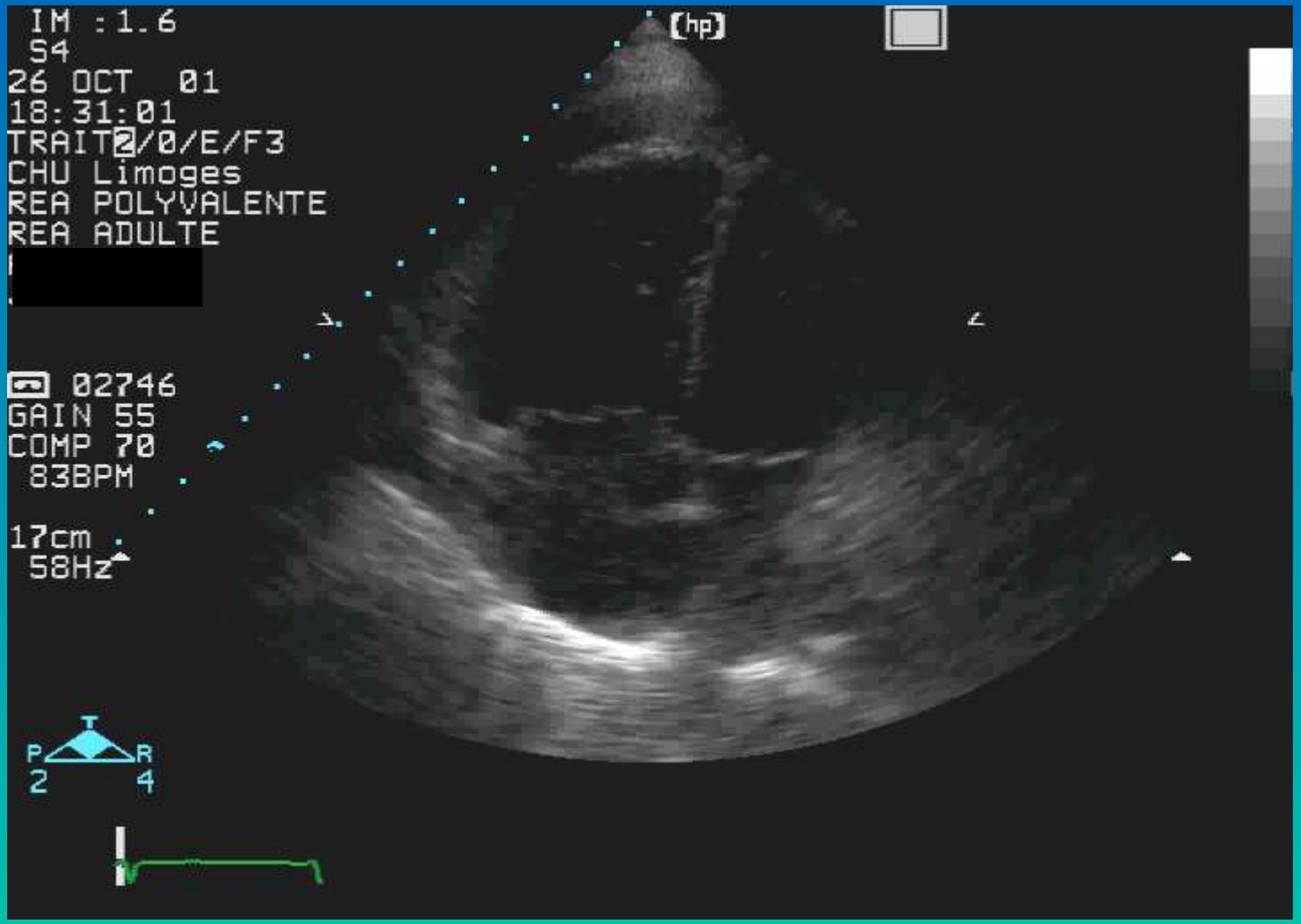
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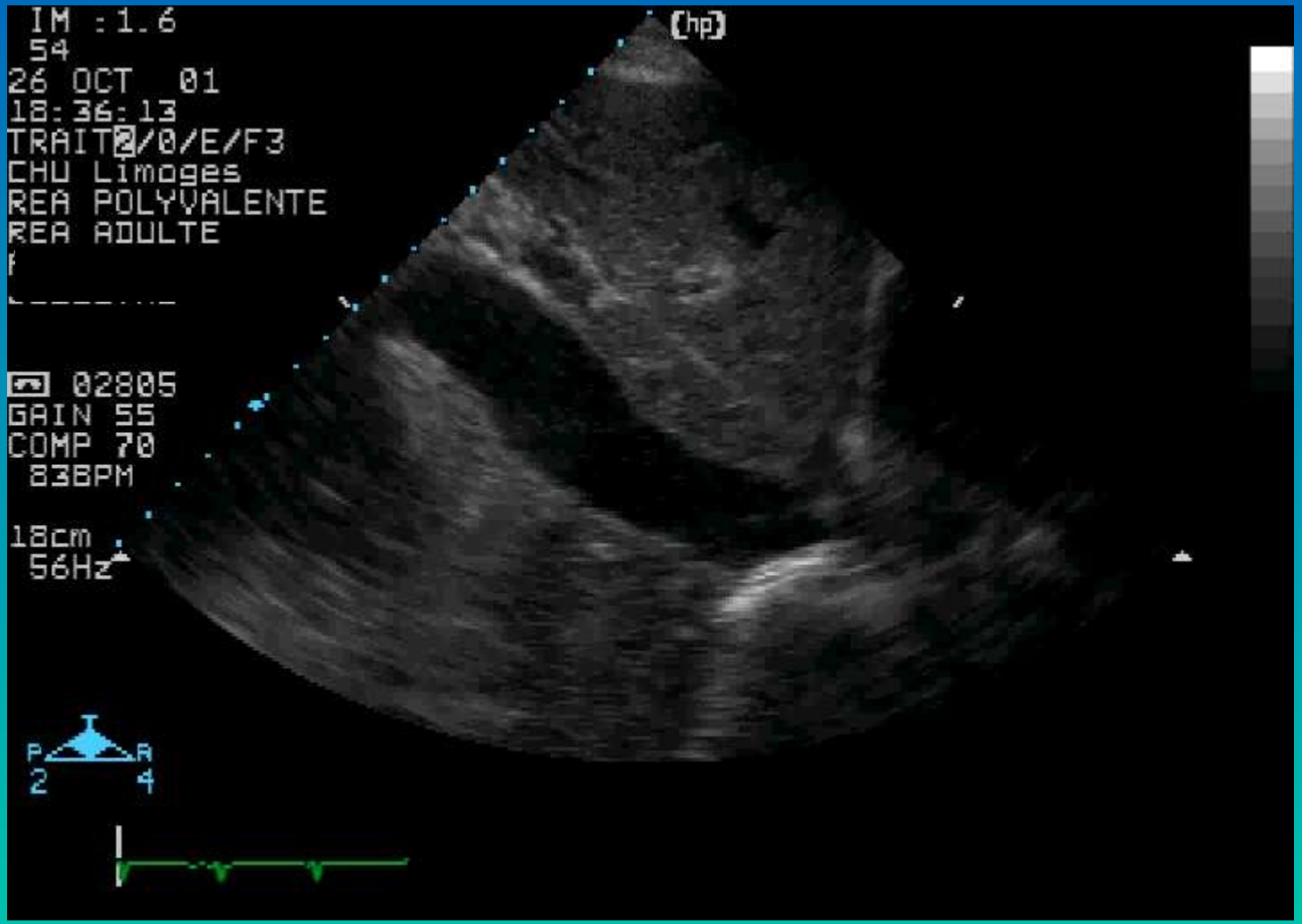
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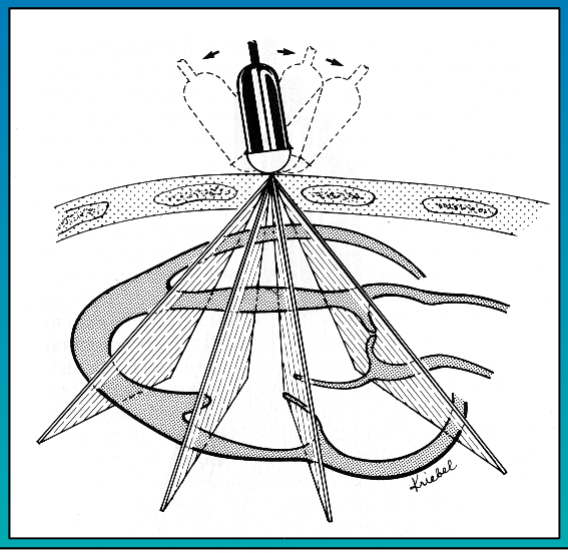
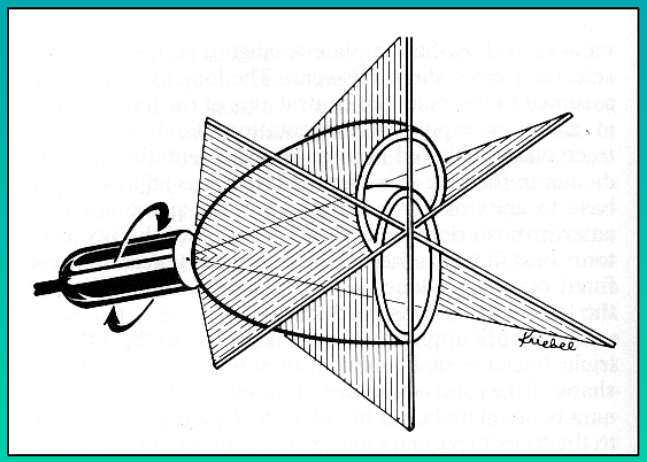
# CONCLUSION

- Two different levels for intensivists
  - Limited skills for emergency clinical situations (every intensivists)
    - Short course and  training duration
    - Diagnosis of typical emergency clinical situation
    - No quantification
  - Advanced : one referent in each ICU
    - Long course
    - Long training
    - Large knowledge

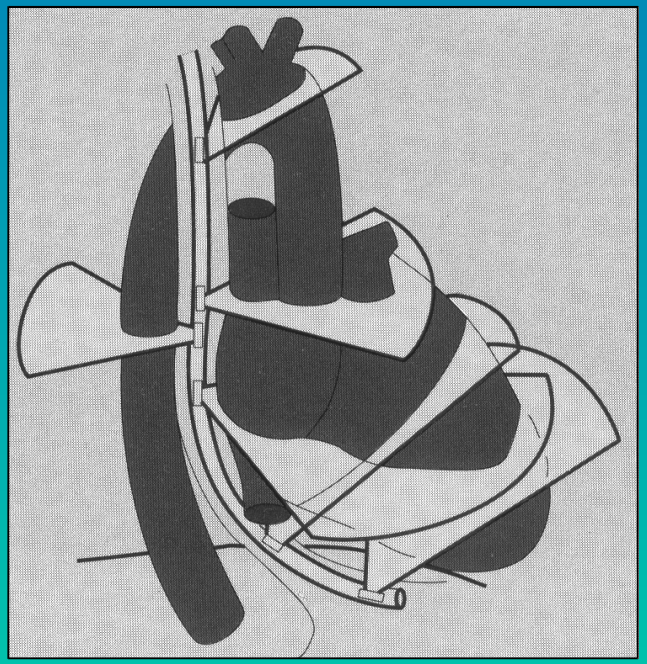
# Methods

TTE

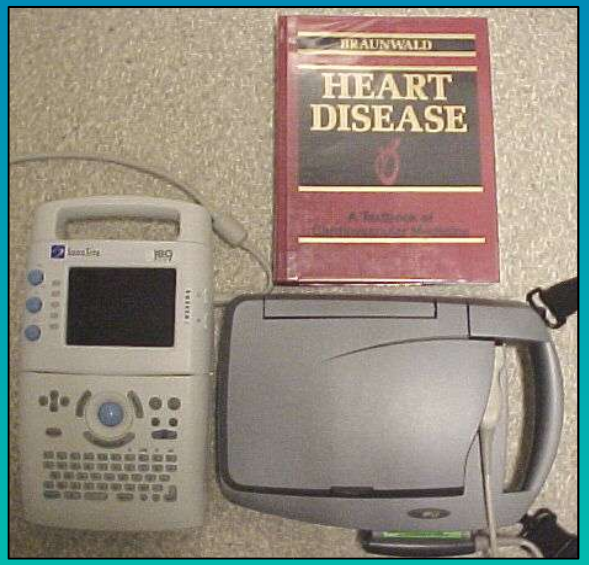




TEE



Hand-Carried



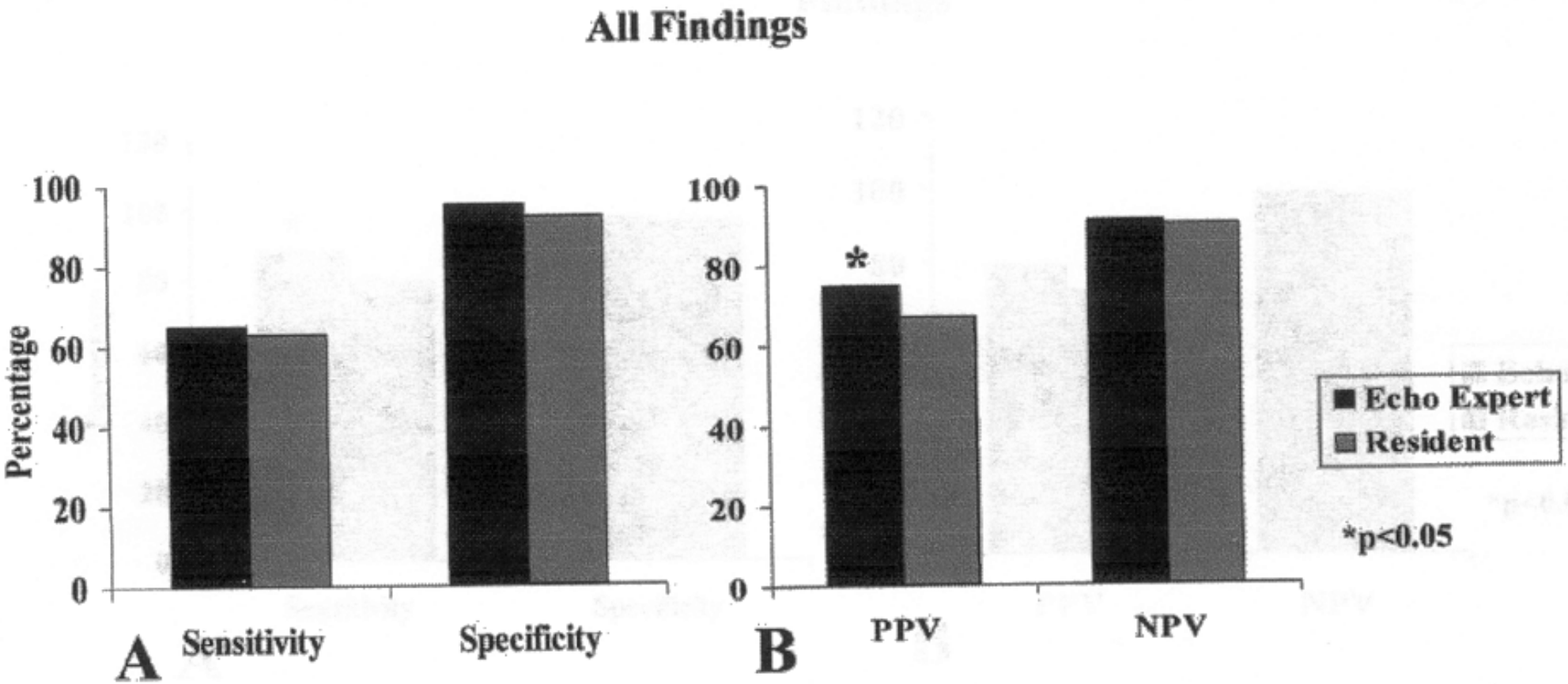



**Figure 1.** (a) Sensitivity and specificity comparisons between echocardiographer-performed studies and resident-performed studies demonstrated moderate overall sensitivity and high specificity for both groups. (b) Comparisons between echocardiographer-performed and resident-performed scans showed a significantly higher overall positive predictive value but similar negative predictive value for echocardiographer-performed studies.

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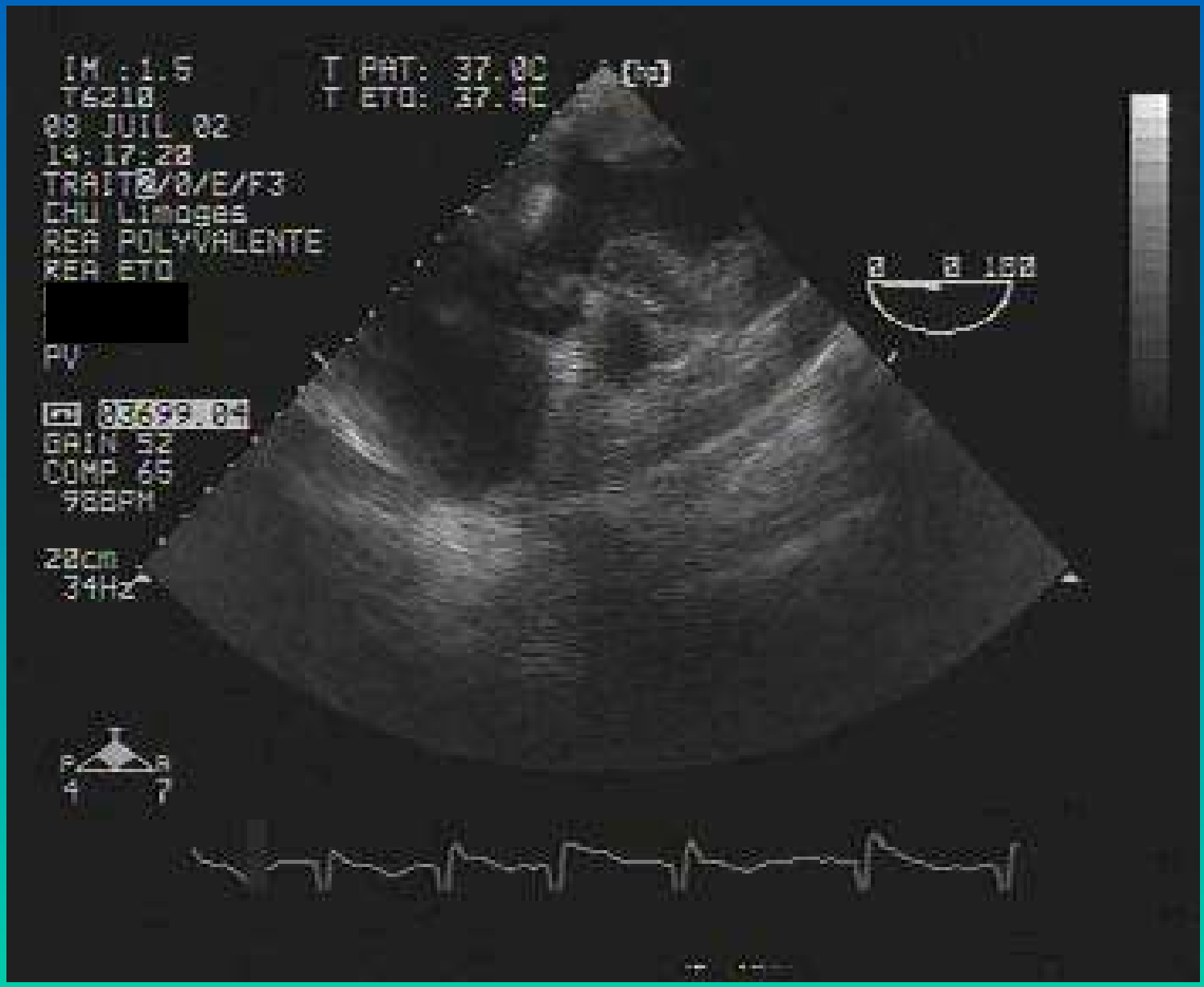
DeCara et al. Eur J Echocardiography 2003;4:141-7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# A Hand-Carried Personal Ultrasound Device for Rapid Evaluation of Left Ventricular Function: Use After Limited Echo Training

Kristina Lemola, M.D., Elina Yamada, M.D., Dinesh Jagasia, M.D., and Richard E. Kerber, M.D.

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# The Use of Small Personal Ultrasound Devices by Internists Without Formal Training in Echocardiography

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# Can Hand-Carried Ultrasound Devices be Extended for Use by the Noncardiology Medical Community?

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