ECHO TRAINING IN FRANCE

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2004-2005 : modifications of certification

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

Echo training for intensivists in France?

Courses

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

Training

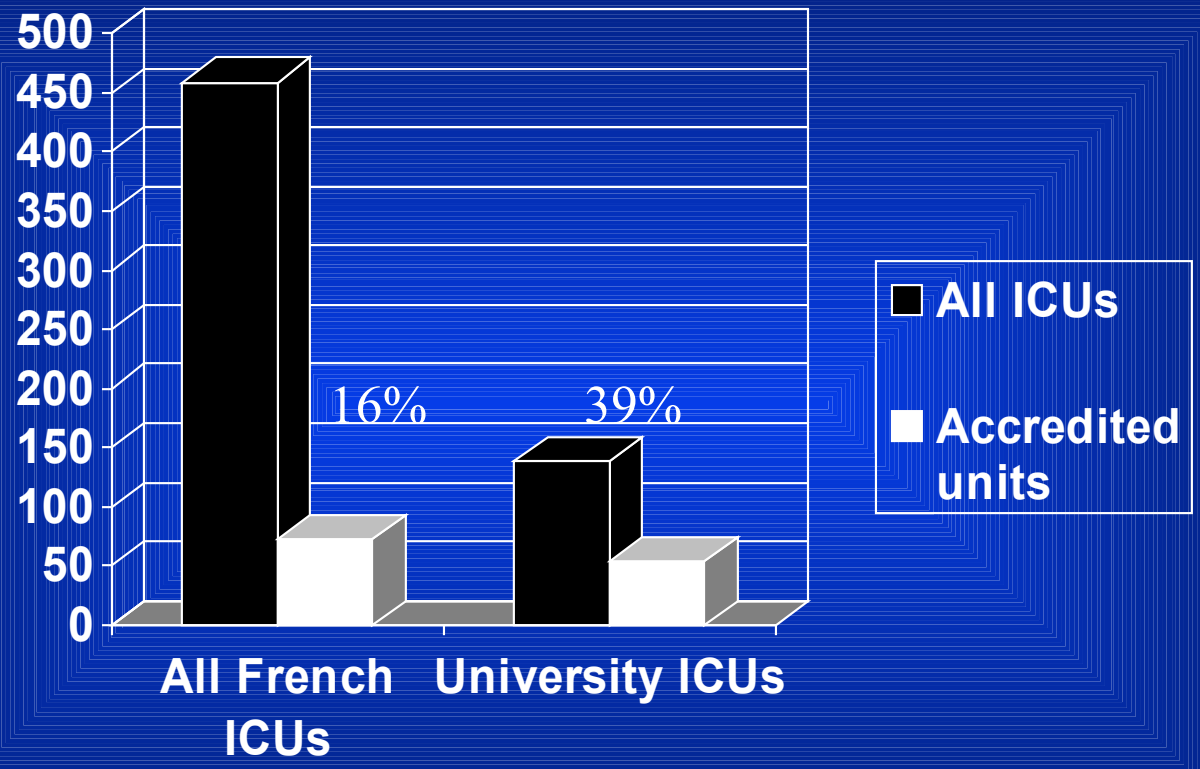
- Accreditation of intensive care unit
- Conditions :
  - Experience echo in ICU
  - Certified medical staff
  - Specific echo machine inside ICU
- Student evaluation book
  - All examinations

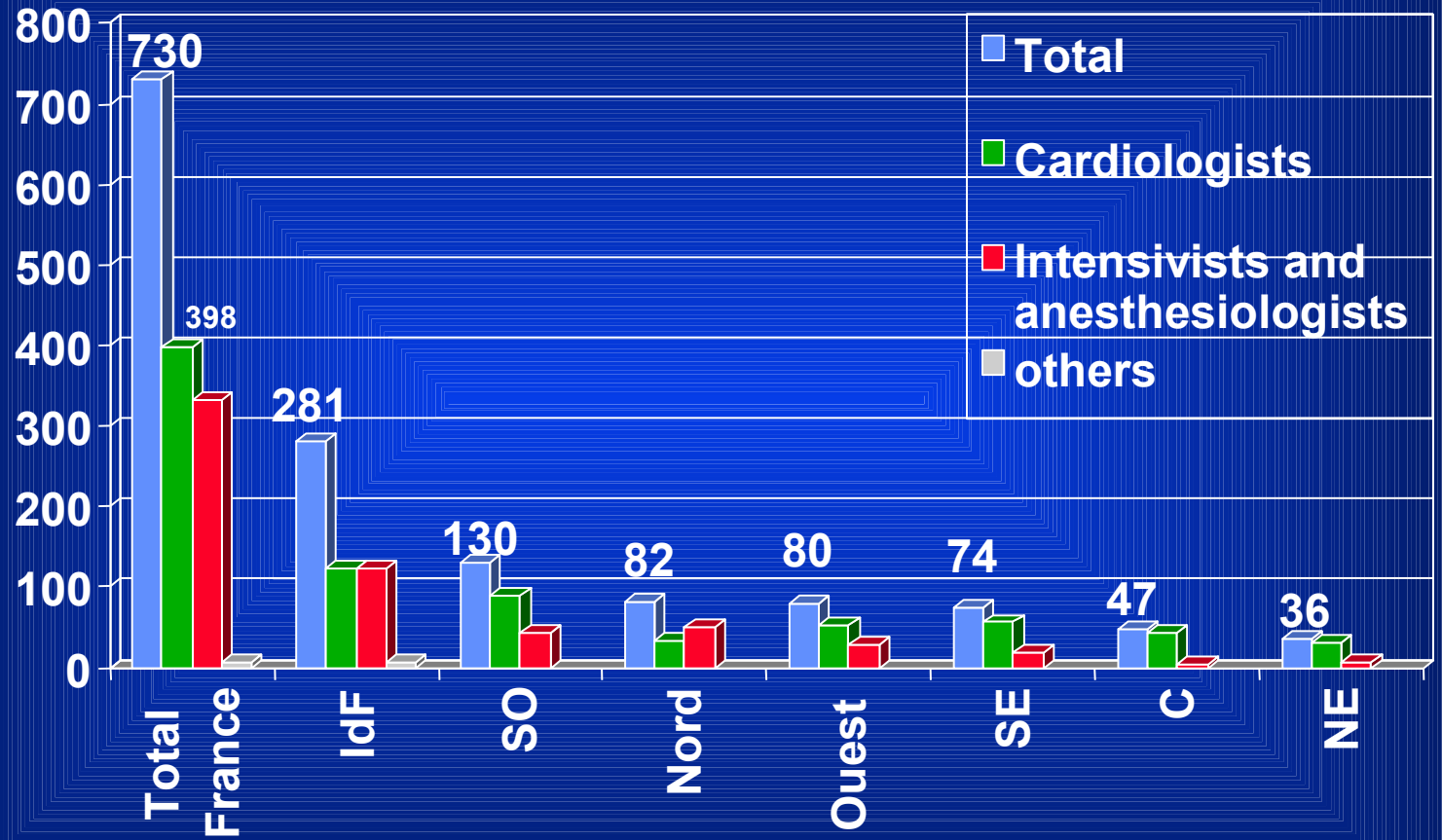
  ≥ 25 esophageal insertions and ≥ 50 TEE as helper
  - Kind of seen pathology

Table 1: Specific educational program for intensivists and anesthesiologists during the second year of certification in echocardiography

1- Heart-lung interactions
2- Why and how to measure cardiac output using echocardiography?
3- Echocardiographic assessment of fluid requirement: "static parameters"
4- Echocardiographic assessment of fluid requirement: "dynamic parameters"
5- Cardiovascular diseases in the ICU; myocardial infarction and its complications, aortic injuries, cardiac tamponade
6- Hemodynamic evaluation using echocardiography in ARDS
7- Hemodynamic evaluation using echocardiography in sepsis
8- Echocardiographic diagnosis of a cardiogenic pulmonary edema
9- Patent foramen ovale and intrapulmonary shunts
10- Echocardiography in pulmonary embolism. Diagnostic and prognostic impact
11- Perioperative evaluation of mitral valve repair
12- Perioperative hemodynamic management
13- Specific patterns of shock after cardiac surgery
14- Respective indications of TTE and TEE; tolerance and pitfalls of TEE
15- Case presentations

Abbreviations: ICU: intensive care unit; ARDS: acute respiratory distress syndrome; TTE: transthoracic echocardiography; TEE: transesophageal echocardiography.

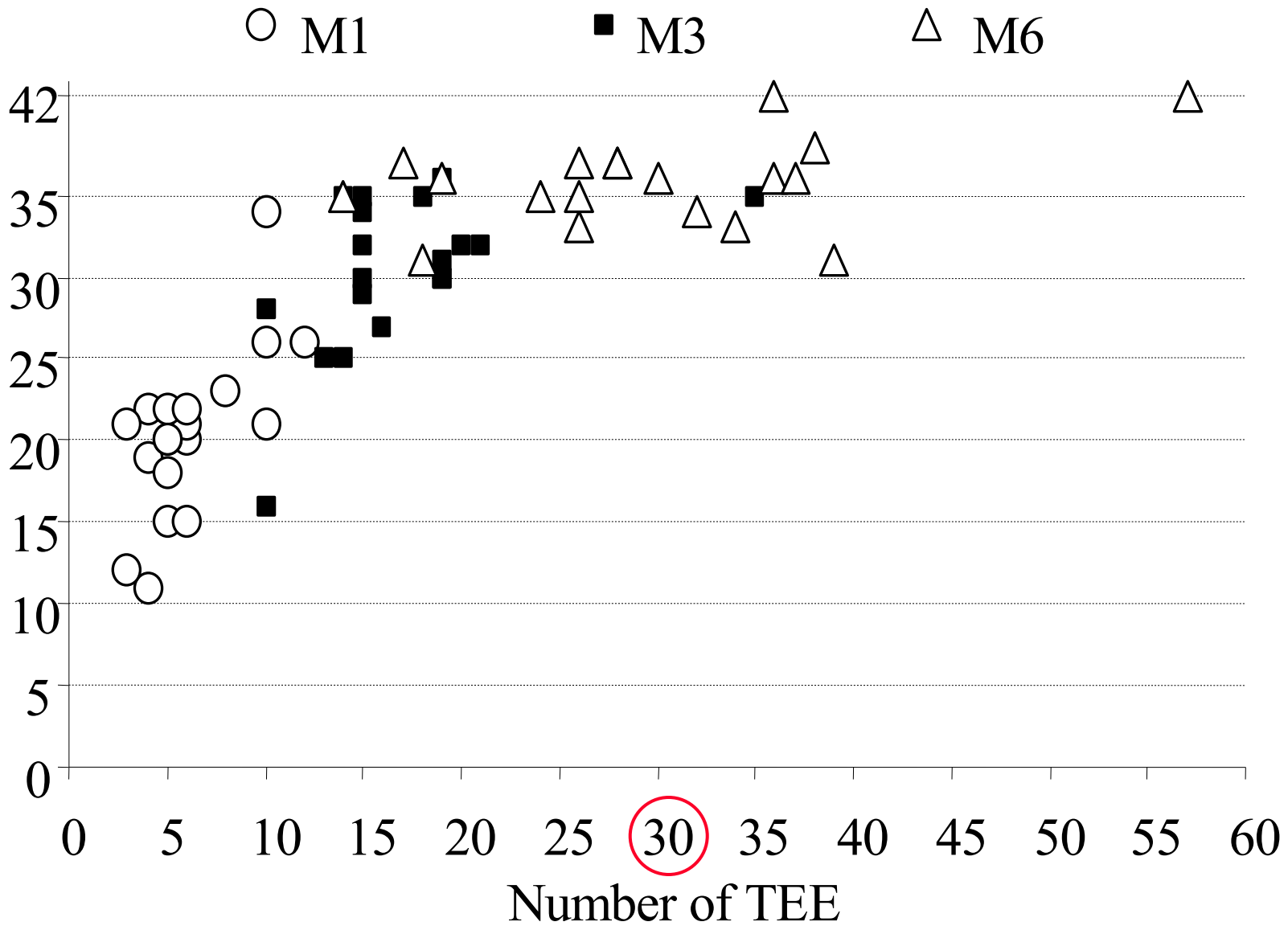

500
450
400
350
300
250
200
150
100
50
0
16%
39%
All French ICUs
University ICUs
All ICUs
Accredited units

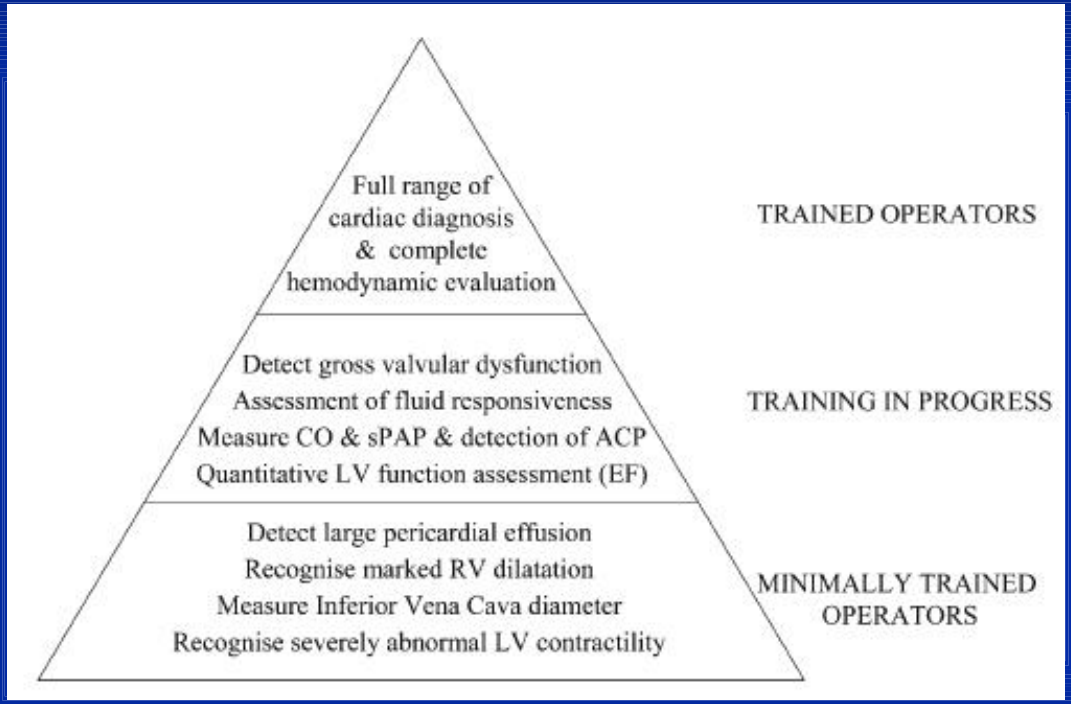

800
700
600
500
400
300
200
100
0
730
398
281
130
82
80
74
47
36
Total
Cardiologists
Intensivists and anesthesiologists
others
Total France
IdF
SO
Nord
Ouest
SE
C
NE

Validation of a skills assessment scoring system for transesophageal echocardiographic monitoring of hemodynamics

Qualitative data collection				Score
Introduction of the probe	No	Problematic	Yes	/2
Long-axis view at 0°	Not recorded	Not optimal	Optimal	/2
Long-axis view at 120°	Not recorded	Not optimal	Optimal	/2
Short-axis view at 0°	Not recorded	Not optimal	Optimal	/2
Short-axis view at 120°	Not recorded	Not optimal	Optimal	/2
View of the base of the heart at 0°	Not recorded	Not optimal	Optimal	/2
View of the base of the heart at 90°	Not recorded	Not optimal	Optimal	/2
			Total	**/14**
Semiquantitative data collection				
Mitral regurgitation	None	Moderate	Marked to massive	/2
Aortic regurgitation	None	Moderate	Marked to massive	/2
Dilatation of right ventricle	None	Moderate	Marked	/2
Pericardial effusion	None	Noncompressive	Compressive	/2
Variations in diameter of superior vena cava	None	Minimal	Large	/2
			Total:	**/10**
Quantitative data collection				
	Intensivist	[redacted]	Expert	
E/A ratio				/2
LV FAS (%)				/2
Aortic VTI (cm)				/2
Pulmonary VTI (cm)				/2
			Total:	**/ 8**
Conclusions				
LV contractility	Normal	Moderately decreased	Greatly decreased	/2
Hypovolemia	No	[redacted]	Yes	/2
RV failure	No	[redacted]	Yes	/2
Treatment proposed	Wrong or incomplete	[redacted]	Right	/2
			Total	**/8**
Final score /42				

FAS: fractional area shortening, LV: left ventricle, RV: right ventricle, VTI: velocity-time integral.


M1
M3
M6
42
35
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
Number of TEE



Cholley ICM 2006

Curriculum for noncardiologic residents (two-dimensional imaging)

Didactics (3 h)
- Ultrasound basics
- Overview on the use of echocardiography in the ICU settings
- Advantages and limits of hand-held echocardiography
- Standard windows to the heart: subcostal, apical four-chamber, parasternal views. Cardiac anatomy: chambers; valves; pericardium; great vessels
- Left ventricular systolic function (global): normal and case reviews
- Left ventricular cavity enlargement: echocardiographic features
- Right ventricular dilatation: definition; etiology; echocardiographic features
- Pericardial fluid: etiology; echocardiographic features; tamponade
- Pleural fluid effusion: echocardiographic features; measurement of interpleural distance for semi-quantitative evaluation [a]

Hands-on (5 h)
- Hand-held device: operating and setting information
- 10–12 ventilated ICU patients to cover all above-listed pathologic features
- Standard windows to the heart: subcostal; apical four-chamber, parasternal views
- Measurement [a]: maximal interpleural distance

Clinical questions	Cases identified by the experienced intensivist (*n*)	Questions not addressed by residents/ experienced intensivist (*n*) [a]	Discrepant positive results yielded by residents (*n*) [b]	Discrepant negative results yielded by residents (*n*) [b]	Kappa values for all addressed clinical questions [c]
LV systolic dysfunction	26 (43%)	3/0	4	3	0.76 ± 0.09 (0.59-0.93)
LV dilatation	13 (21%)	4/0	4	3	0.66 ± 0.12 (0.43-0.90)
RV dilatation	13 (21%)	5/1	1	4	0.71 ± 0.12 (0.46-0.95)
Pericardial effusion	6 (10%)	2/1	2	1	0.68 ± 0.18 (0.33-1.03)
Tamponade	1 (2%)	–	0	0	–
Pleural effusion	43 (70%)	13/1	2	1	0.71 ± 0.09 (0.53-0.88)

Vignon ICM 2007

Jan Poelaert
Paul Mayo

Education and evaluation of knowledge and skills in echocardiography: how should we organize?