

Echokardiografie na urgentu nekardiologem

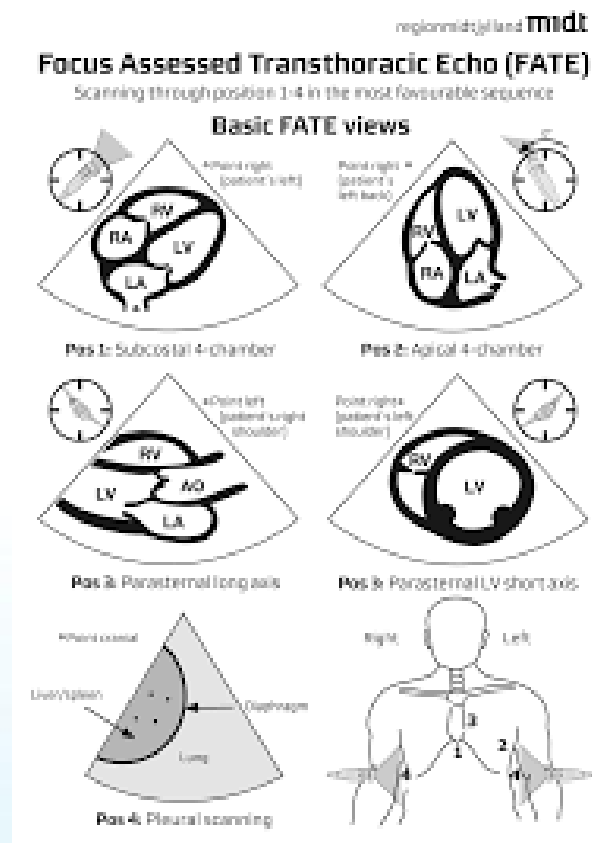
MUDr. Ondřej Rennét
Oddělení urgentní medicíny
Pardubická nemocnice

Zmatení pojmů

- POCUS – Point of Care Ultrasound
- FOCUS – Focus Cardiac Ultrasound
- POCE – Point of Care Echocardiography

POCUS

- FEEL (Focused Echocardiography in Emergency Life Support)
- FATE (Focus Assessed Transthoracic Echo)





ESC

European Society
of Cardiology

European Heart Journal - Cardiovascular Imaging (2018) 19, 475–481
doi:10.1093/ehjci/jeu006

**EACVI CONSENSUS
DOCUMENT**

Focus cardiac ultrasound core curriculum and core syllabus of the European Association of Cardiovascular Imaging[†]

Aleksandar N. Neskovic^{1*}, Henry Skinner^{2‡}, Susanna Price^{3¶}, Gabriele Via^{4§}, Stefan De Hert^{5||}, Ivan Stankovic¹, Maurizio Galderisi⁶, Erwan Donal⁷, Denisa Muraru⁸, Erik Sloth⁹, Luna Gargani¹⁰, Nuno Cardim¹¹, Alexandros Stefanidis¹², Matteo Cameli¹³, Gilbert Habib^{14,15}, Bernard Cosyns¹⁶, Patrizio Lancellotti¹⁷, Thor Edvardsen¹⁸, and Bogdan A. Popescu¹⁹

Reviewers: This document was reviewed by members of the 2016–2018 EACVI Scientific Documents Committee: **Victoria Delgado, Alessia Gimelli, Frank A. Flachskampf, Pier Giorgio Masci, and by external reviewers: Nina Ajmone Marsan, Giovanni Di Salvo, Kevin Fox, Ruxandra Jurcut**

¹Department of Cardiology, Clinical Hospital Center Zemun, Vukova 9, 11080 Belgrade, Faculty of Medicine, University of Belgrade, Serbia; ²Department of Anaesthesiology, Nottingham University Hospitals, Hucknall Rd, Nottingham NG5 1PB, UK; ³Adult Intensive Care Unit, Royal Brompton and Harefield NHS Foundation Trust, Sydney Street, London SW3 6NP, UK; ⁴Department of Anesthesia and Intensive Care, Cardiocentro Ticino, Via Tesserete 48, 6900 Lugano, Switzerland; ⁵Department of Anaesthesiology and Perioperative Medicine, Ghent University Hospital, Ghent University, Corneel Heymanslaan 10, B-9000 Ghent, Belgium; ⁶Department of Advanced Biomedical Sciences, Federico II University Hospital, Via S. Pansini 5, 80131 Napoli, Italy; ⁷Department of Cardiology, University Hospital of Rennes, rue H Le Guillou – Hôpital Pontchaillou, 35000 Rennes, France; ⁸Department of Cardiac, Thoracic and Vascular Sciences, University of Padua, Via Giustiniani 2, 35128 Padua, Italy; ⁹Department of Anaesthesiology and Intensive Care

Downloaded from <https://academic.oup.com/ehjci/advance-article/doi/10.1093/ehjci/jeu006/5000000>

POCE

- British Society of Echocardiography Level 1



British Society
of Echocardiography

[Register or Sign In](#)[Cart](#)[News](#)[About](#)[Personal accreditation](#)[Departmental accreditation](#)[Membership](#)[Events](#)[Education](#)[Research](#)[Resource Hub](#)

Level 1 (L1) accreditation

Level 1 accreditation allows rapid bedside echocardiographic assessment of the acutely unwell patient and was launched in April 2018 in response to and in anticipation of the Department of Health mandate for 24/7 provision of emergency echo services.

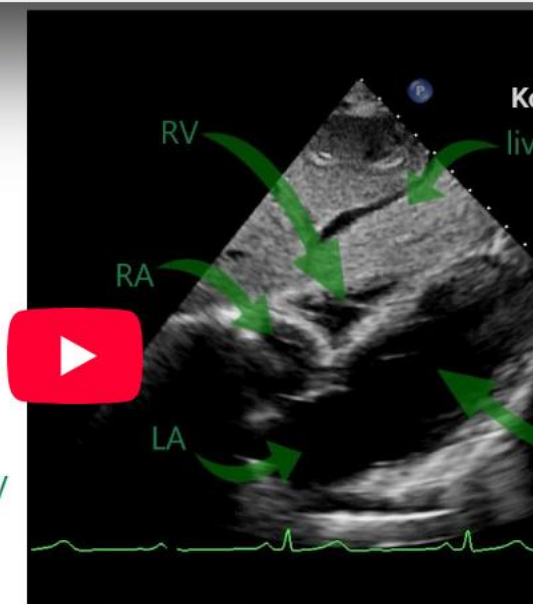
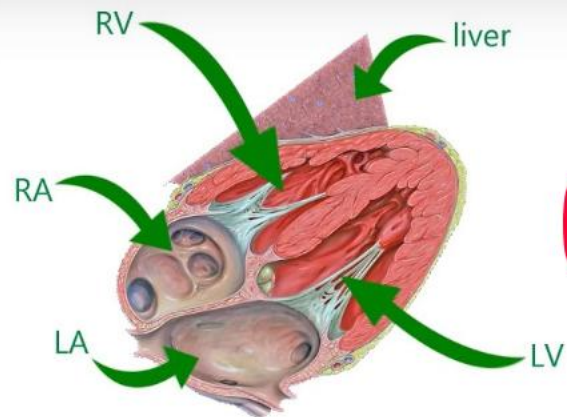
It utilises a dataset of 17 images to allow for assessment and diagnosis of clinically important and commonly encountered acute pathology to guide bedside management. It allows

[Accreditation pack \(PDF\)](#)[Level 1 minimum dataset](#)

British Society of Echocardiography Level 1

- Členství v BSE
- Mentor
- 75 dokumentovaných případů během 12 měsíců
- Prezenční zkouška
- Akreditace platná 5 let, následně nutná reakreditace

1 Subcostal 4 Chamber (SC4Ch) Level 1 - The Focused Echo

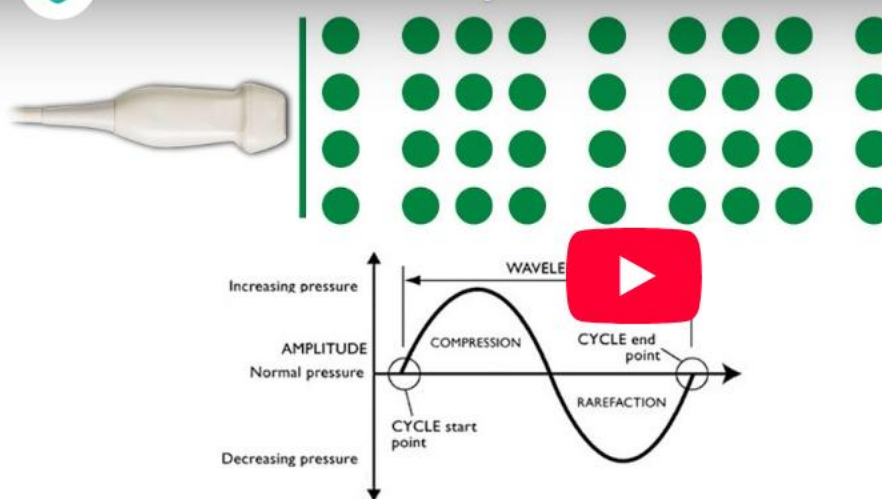


Vysílá: YouTube



British Society
of Echocardiography

Level 1 - Ultrasound Physics



Vysílá: YouTube

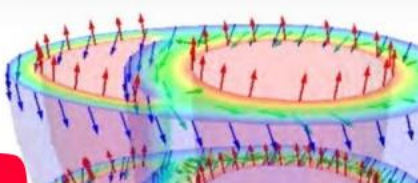


British Society
of Echocardiography

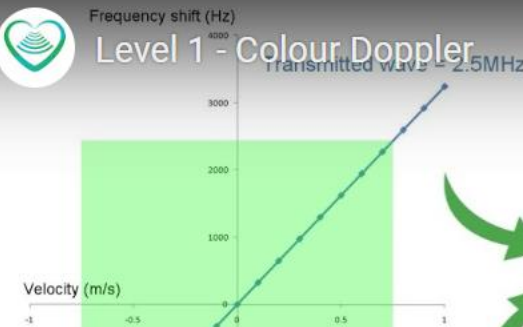
Level 1 - Size and Function



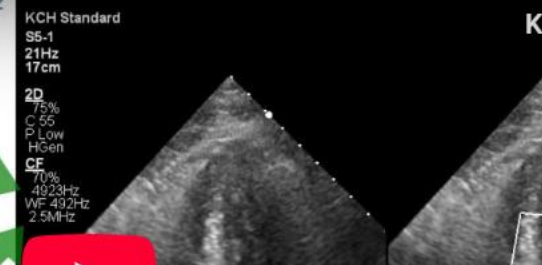
Comput Methods Biomech Biomed Engin. 2014 August ; 17(11): 1217-1226. doi: 10.1080/10255842.2012.739167.
**Generating fiber orientation maps in human heart
Poisson interpolation**
Jonathan Wong^{a,*} and Ellen Kuhl^{a,b,c}



Level 1 - Colour Doppler



KCH Standard
S5-1
21Hz
17cm
2D
75%
C 55
P Low
H Gen
CF
70%
4023Hz
WF 492Hz
2.5MHz



Level 1 Echocardiogram Report		
Patient name:	MRN:	DOB:
Sonographer's name:	Date of scan:	Log #:

(studies submitted to the BSE must not include patient identifiers: name; MRN; DOB)

Patient details

Age:	Sex:	Background and clinical question:
Location:		
Rhythm:	Rate:	
Systemic BP:	CVP:	
CVS support:		
Ventilation:		



Focused findings

(select one option per row)

		LVIDD (mm):	TAPSE (mm):	
LV wall thickness	Normal	Abnormal		UIA
LV cavity size	Normal cavity size	Small	Dilated	UIA
LV systolic function	Normal or borderline low	Impaired	Severely impaired	UIA
RV wall thickness	Normal	Abnormal		UIA
RV cavity size	Normal	Small	Dilated	UIA
RV systolic function	Normal	Impaired		UIA
IAS position	Normal (mid-position)	Fixed from the left towards the right	Fixed from the right towards the left	UIA
Aortic root	Normal	Dilated		UIA
AoV morphology	Normal	Abnormal		UIA
AoV structure	Normal or mild thickening	Heavily thickened or calcified (unrestricted opening)	Heavily thickened or calcified (restricted opening)	UIA
AoV competence	Normal (no regurgitation)	Regurgitation present (not significant)	Significant regurgitation	UIA
MV structure	Normal or mild thickening	Heavily thickened or calcified (unrestricted opening)	Heavily thickened or calcified (restricted opening)	UIA
MV competence	Normal (no regurgitation)	Regurgitation present (not significant)	Significant regurgitation	UIA
TV structure	Normal or mild thickening	Heavily thickened or calcified (unrestricted opening)	Heavily thickened or calcified (restricted opening)	UIA
TV competence	Normal (no regurgitation)	Regurgitation present (not significant)	Significant regurgitation	UIA
IVC size	Normal IVC size	Small	Dilated	UIA
IVC variability	Normal variation with patient's respiration/ventilation	Excessive respiratory variation (collapse or distension)	Reduced respiratory variation (collapse or distension)	UIA

Additional Findings: (important findings not covered within the reporting matrix)	
Conclusions: (including reference to the clinical question)	
Does the patient require referral for Level 2 study? (presence of findings in red usually warrant immediate expert help)	Yes No
Sonographer's signature:	

Reviewer's comments (must always be completed)

Reviewers name: (mandatory)	Date of review: (mandatory)
Level of supervision: (mandatory)	Directly supervised Face-to-face review Remote review
Comments regarding image acquisition: (optional)	
Comments may be completed by the reviewer, or alternatively by the sonographer following the reviewer's verbal feedback (please specify)	
Comments completed by:	Reviewer Sonographer
Comments regarding image interpretation: (optional)	
Comments may be completed by the reviewer, or alternatively by the sonographer following the reviewer's verbal feedback (please specify)	
Comments completed by:	Reviewer Sonographer
Reviewer's signature: (mandatory)	

BSE Level 1 – logbook



The logbook should reflect the normal case-load of acutely unwell patients with the following constraints:

- At least 5 cases should be for impaired left ventricular systolic function
- At least 5 cases should be for impaired right ventricular systolic function
- At least 3 cases should be of aortic valve disease
- At least 3 cases should be of mitral valve disease
- At least 3 cases should be of tricuspid valve disease
- At least 3 cases should be for hypovolaemia
- At least 2 cases should be for pericardial effusions
- At least 1 case should be for aorta root dilatation
- A maximum of 20 cases should be for no significant abnormality

BSE Level 1 – cíle vyšetření

Aim to rule out:

- Gross hypovolaemia
- Severe LV dysfunction
- RV dilatation/failure
- AV dysfunction/disruption
- MV dysfunction/disruption
- Abnormal pericardial fluid volume

Using:

- PLAX
- PSAX all levels
- A4 Ch
- A5 Ch
- Subcostal views
- Colour on PLAX and A4Ch view
- M-mode (TAPSE and IVC)

BSE Level 1 – rozsah vyšetření

PLAX deep (2D)

Visual assessment of pleural and pericardial effusions

PLAX (2D)

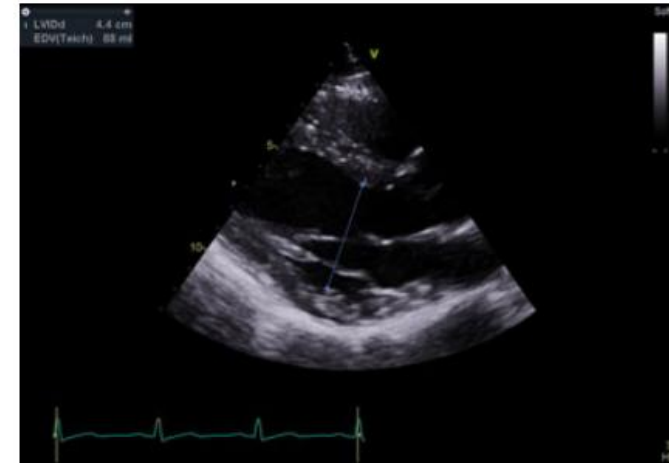
Optimise depth to look at cardiac structures
Visual assessment of LV size and function
Visual assessment of RV
AV appearance and movement
MV appearance and movement
Major regional wall motion abnormalities



BSE Level 1 – rozsah vyšetření

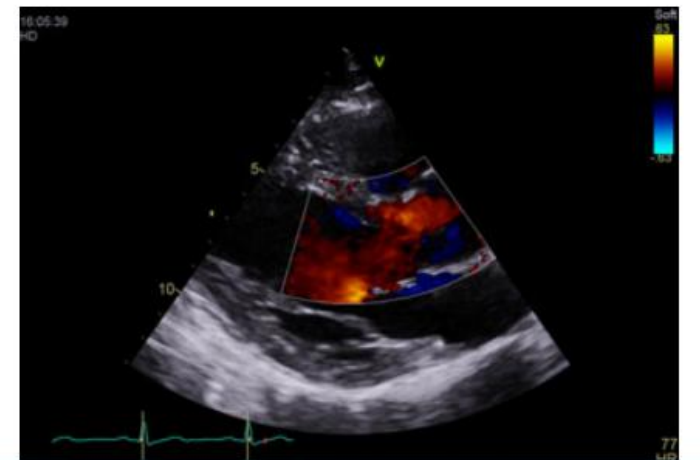
PLAX (2D) LVIDd

Measurement of left ventricular internal diameter (LVID) in diastole
Visual assessment of aortic root size



PLAX (2D) with colour Doppler over aortic valve (AV)

Check colour Doppler settings
Colour box over AV
Look for abnormal flow over AV



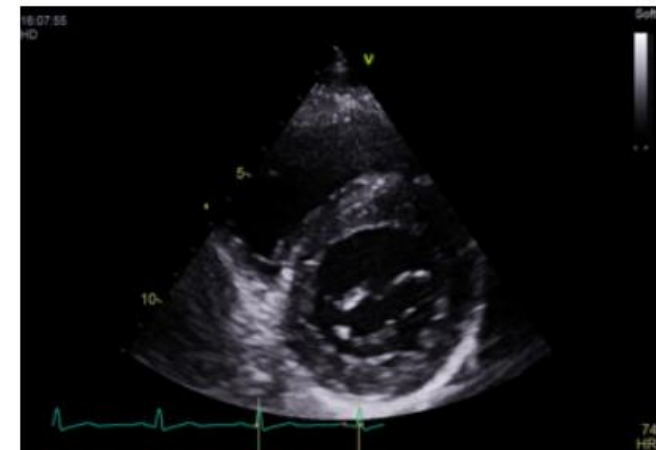
BSE Level 1 – rozsah vyšetření

PSAX Outflow (2D)

AV appearance and function

PSAX Base (2D)

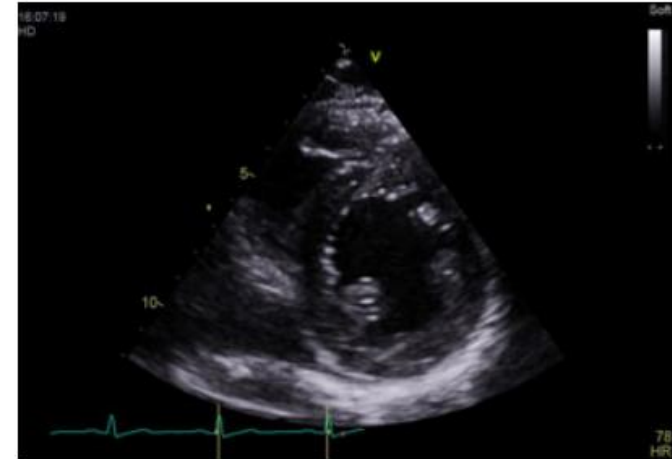
MV appearance and function
Radial systolic function
Major regional wall motion abnormalities



BSE Level 1 – rozsah vyšetření

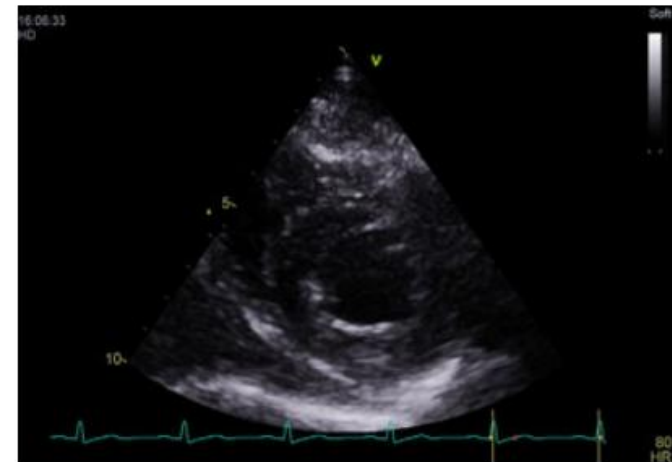
PSAX Mid (2D)

Radial systolic function
Major regional wall abnormalities



PSAX Apex (2D)

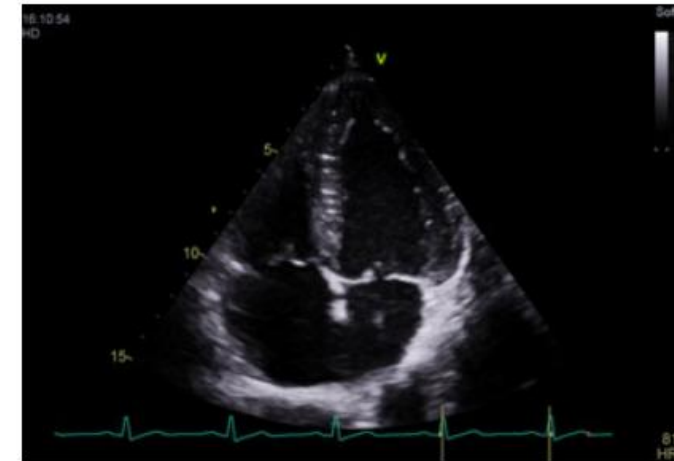
Radial systolic function
Major regional wall abnormalities



BSE Level 1 – rozsah vyšetření

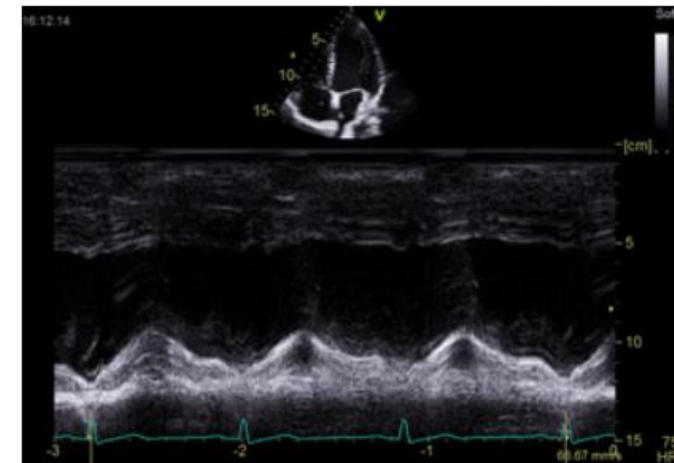
Apical 4 chamber (2D)

- LV cavity size (visual assessment)
- Visual assessment of longitudinal and radial function
- Major regional wall abnormalities
- MV appearance and function
- TV appearance and function
- RV cavity size (compared with LV size)
- RV free wall motion (visual assessment)
- Visual assessment of RV free wall hypertrophy
- Observe atrial septal position/mobility



A4C (M-Mode) TAPSE

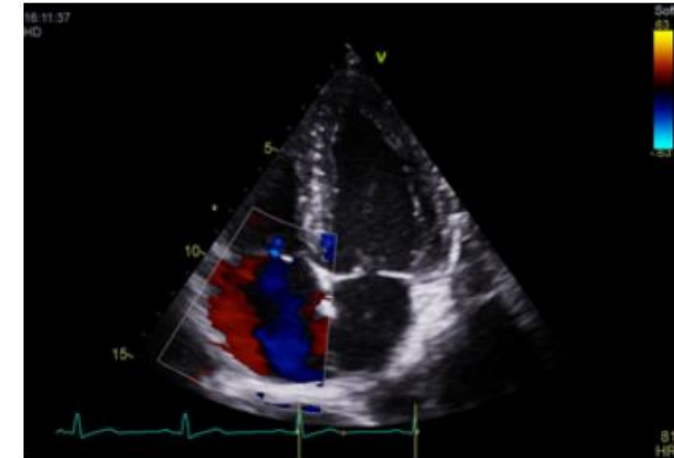
- M-mode through the lateral tricuspid valve annulus
- Measure tricuspid annular plane systolic excursion (TAPSE)



BSE Level 1 – rozsah vyšetření

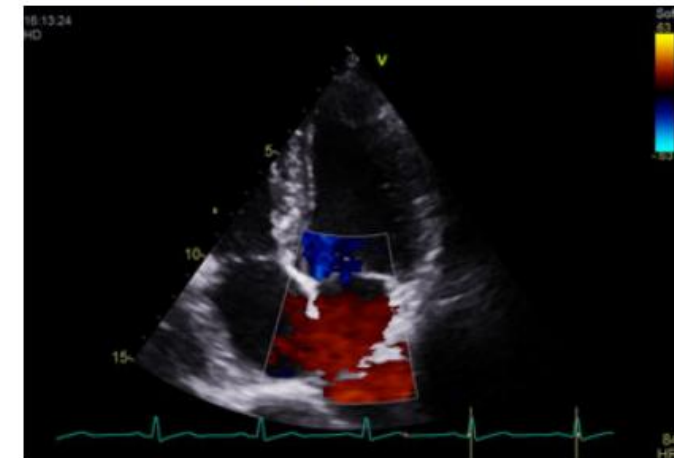
A4C (2D) with CFM TV

Check colour Doppler settings
Look for abnormal colour flow over TV



A4C (2D) with CFM MV

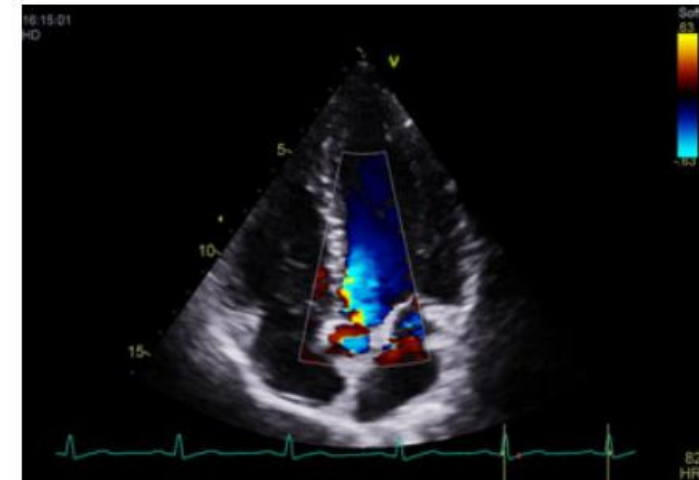
Check colour Doppler settings
Look for abnormal colour flow over MV



BSE Level 1 – rozsah vyšetření

A5C (2D) with CFM AV

Check colour Doppler settings
Look for abnormal flow over AV



Subcostal 4Ch (2D)

Relative chamber sizes and function
Visual assessment of RV free wall
hypertrophy
Atrial septal position and hypertrophy
Pericardial effusion



BSE Level 1 – rozsah vyšetření

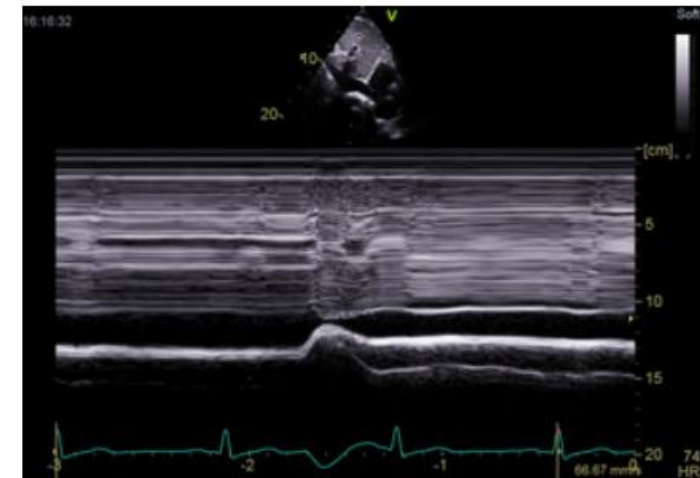
Subcostal IVC (2D)

Observe size and collapsibility
with respiration



Subcostal IVC (M-mode)

Assess IVC size and variation with respiration
Dilated IVC may indicate high right atrial
pressure



BSE Level 1 – zkouška

- Revize logbooku
- Vyšetření na dobrovolníkovi
- Popis nahraných smyček

BSE Level 1 – happy end 😊





Litomyšlská nemocnice



Svitavská nemocnice



Orlickoústecká nemocnice



Chrudimská nemocnice



Pardubická nemocnice

Děkuji za pozornost