Accuracy of prehospital eFAST: a retrospective review

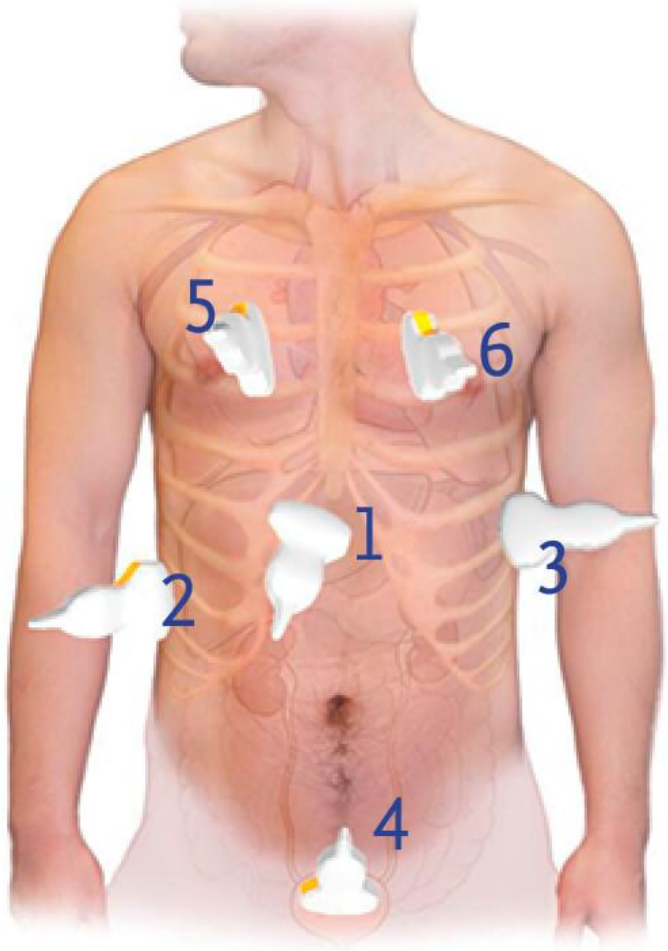
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Extended Focused Assessment with Ultrasound in Trauma



1. Pericardium
2. Right upper quadrant
3. Left upper quadrant
4. Suprapubic area
5. Right anterior thoracic
6. Left anterior thoracic

Current evidence



27%

Overall

Tikvesa et al, Eur J Trauma Emerg Surg, 2025



29%

Pooled sensitivity for pneumothorax

Sen et al, Emerg Med J 2025



60%

Pooled sensitivity for free fluid

Lin et al, BMC Emerg Med 2024



Training, equipment, and governance

Training

- One-day HUMMER course: eFAST image acquisition, interpretation and integration into prehospital workflows

Governance

- Ultrasound faculty review every saved scan and give feedback to the operator
- False-negative and false-positive scans reported to the Ministry of Health (saved scans only)

Credentialling

- Theory course, summative assessment, and image-interpretation practice
- Five saved scans a year reviewed by ultrasound faculty



GE Vscan Air (curvilinear + linear) paired with an iPhone 13

Case selection

Inclusion

- Primary response
- Between Jan 2023 and Dec 2025
- Blunt or penetrating trauma
- Complete eFAST
- In-hospital CT or OT findings

Exclusion

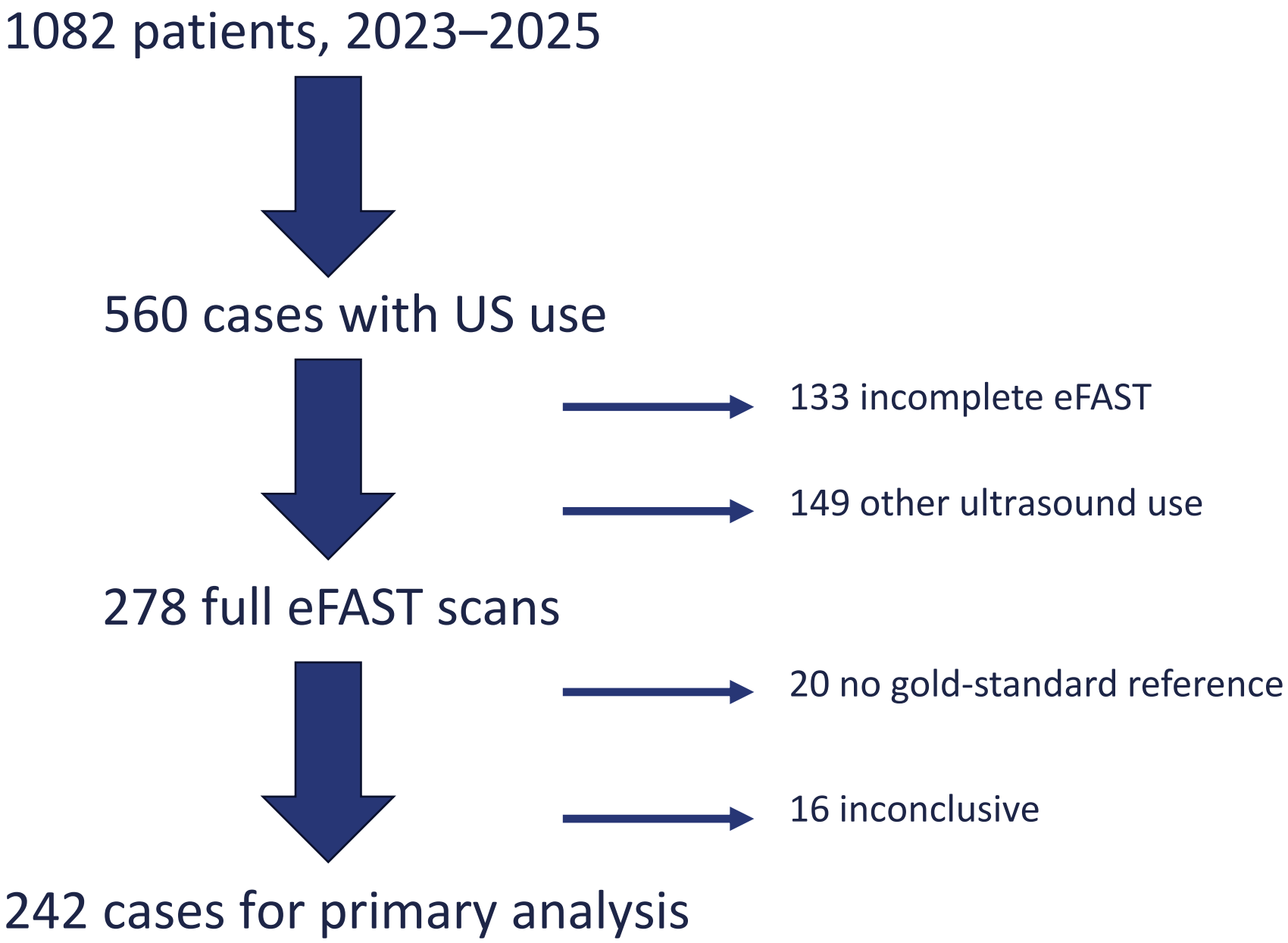
- Inconclusive studies
- Chest decompression prior to US

Primary outcome

- Sensitivity and specificity of pre-hospital eFAST scan

Secondary outcome

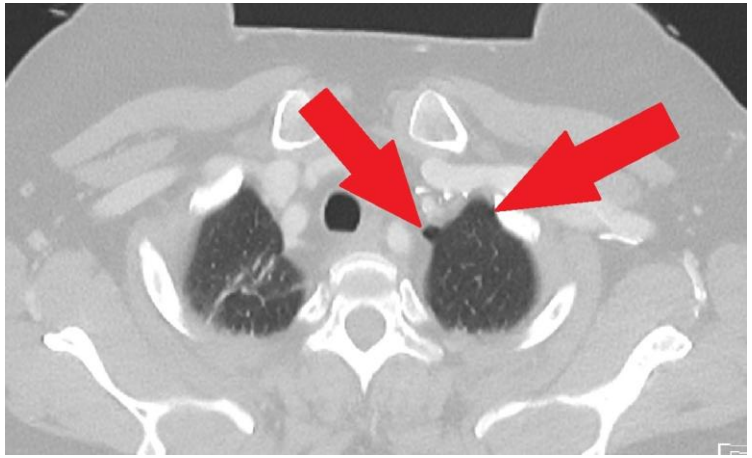
- Does age, sex, BMI, trauma type, clinician grade, clinician specialty, or year affect scan accuracy

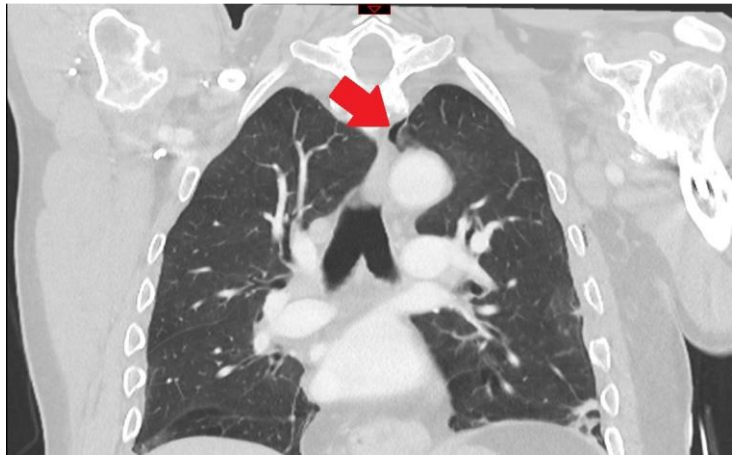

1082 patients, 2023–2025
560 cases with US use
133 incomplete eFAST
149 other ultrasound use
278 full eFAST scans
20 no gold-standard reference
16 inconclusive
242 cases for primary analysis

Trivial CT findings counted as negative



Small haemothorax





Tiny apical pneumothorax

All four had to apply

- Not expected on ultrasound
- No intervention needed
- Not visible on X-ray
- Insignificant to two specialists

Most of our patients were young adult males with blunt trauma

Total cases	242
Age	
Median (IQR)	33 (22–54)
Paediatric (<16 years), n (%)	20 (8.3)
Adult (16+ years), n (%)	222 (91.7)
Sex, n (%)	
Female	58 (24.0)
Male	184 (76.0)
Mechanism, n (%)	
Blunt trauma	228 (94.2)
Penetrating trauma	14 (5.8)

Year, n (%)	
2023	67 (27.7)
2024	90 (37.2)
2025	85 (35.1)
Clinician level, n (%)	
Staff specialist	125 (51.7)
Registrar	117 (48.3)
Clinician specialty, n (%)	
Emergency medicine	133 (55.0)
Anaesthetics	66 (27.3)
Intensive care	43 (17.7)

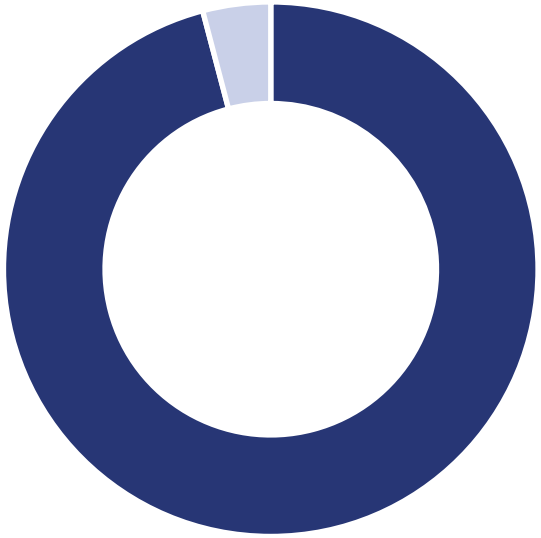
Pre-hospital eFAST accuracy



65.3%

sensitivity

95% CI 50–78%



96%

specificity

95% CI 92–98%

Accuracy of prehospital eFAST scans

	Clinical reference standard: Positive	Clinical reference standard: Negative	Total
Index test: Positive	**32** true positive	**8** false positive	40
Index test: Negative	**17** false negative	**185** true negative	202
Total	49	193	**242**

Factors associated with scan accuracy

	OR (95% CI)	P-value
Age		
Paediatric (<16 years)	*Ref*	
Adult (16+ years)	**2.84 (1.05–7.68)**	**0.04**
Sex		
Male	*Ref*	
Female	1.57 (0.69–3.60)	0.28
BMI*		
30+	*Ref*	
<30	1.20 (0.41–3.54)	0.74
Mechanism		
Blunt	*Ref*	
Penetrating	0.83 (0.22–3.10)	0.78

	OR (95% CI)	P-value
Year		
2023	*Ref*	
2024	1.13 (0.51–2.50)	0.76
2025	1.34 (0.59–3.05)	0.49
Clinician level		
Staff specialist	*Ref*	
Registrar	1.21 (0.63–2.32)	0.56
Clinician specialty		
Anaesthetics	*Ref*	
Emergency medicine	1.76 (0.83–3.75)	0.14
Intensive care	0.86 (0.35–2.09)	0.73

The emergency department eFAST missed most of them too

17

false-negative prehospital scans

9

had an emergency department eFAST

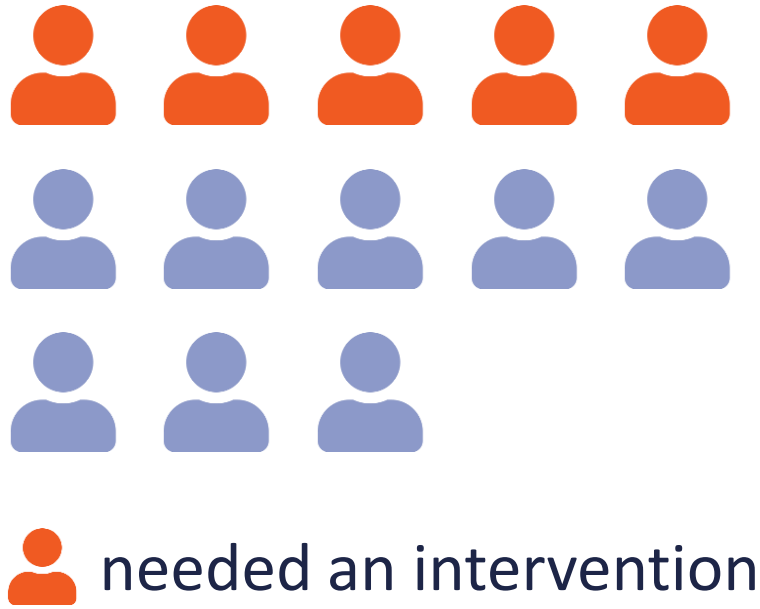
7

were also negative

Patients with a false-negative scan that needed an intervention

5 of 13

patients with a recorded outcome





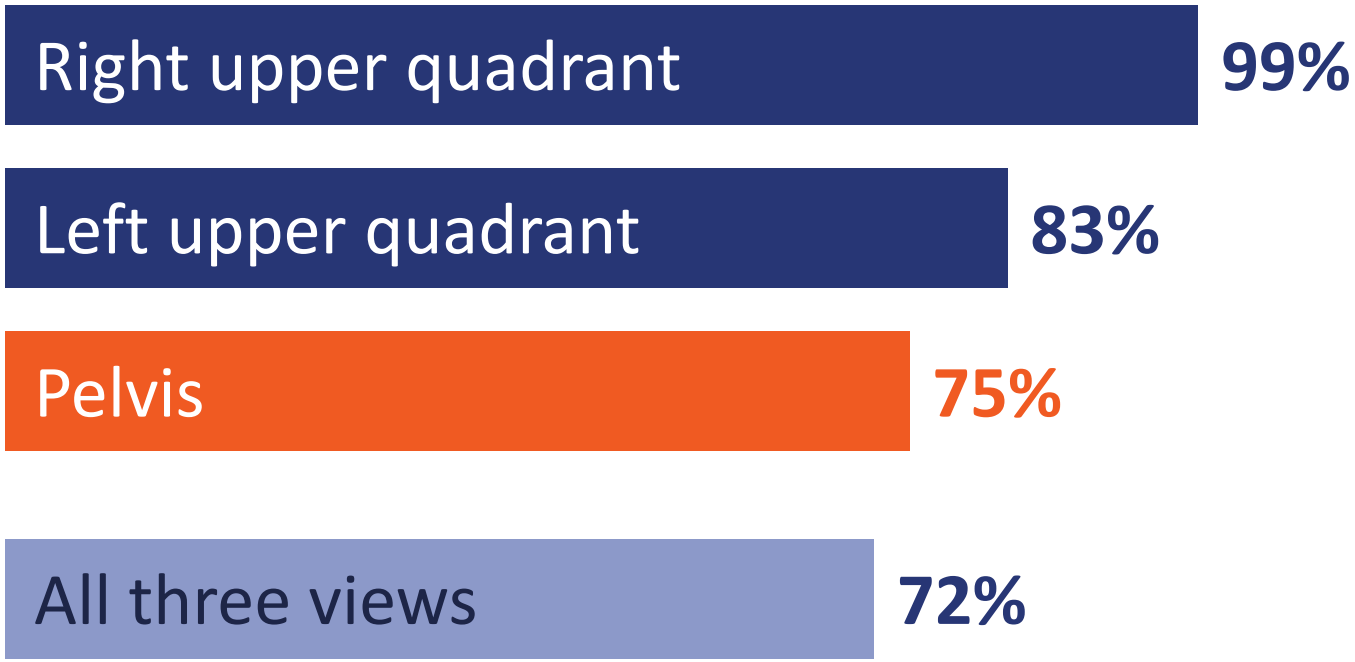
How we used ultrasound in trauma

Lung only scans

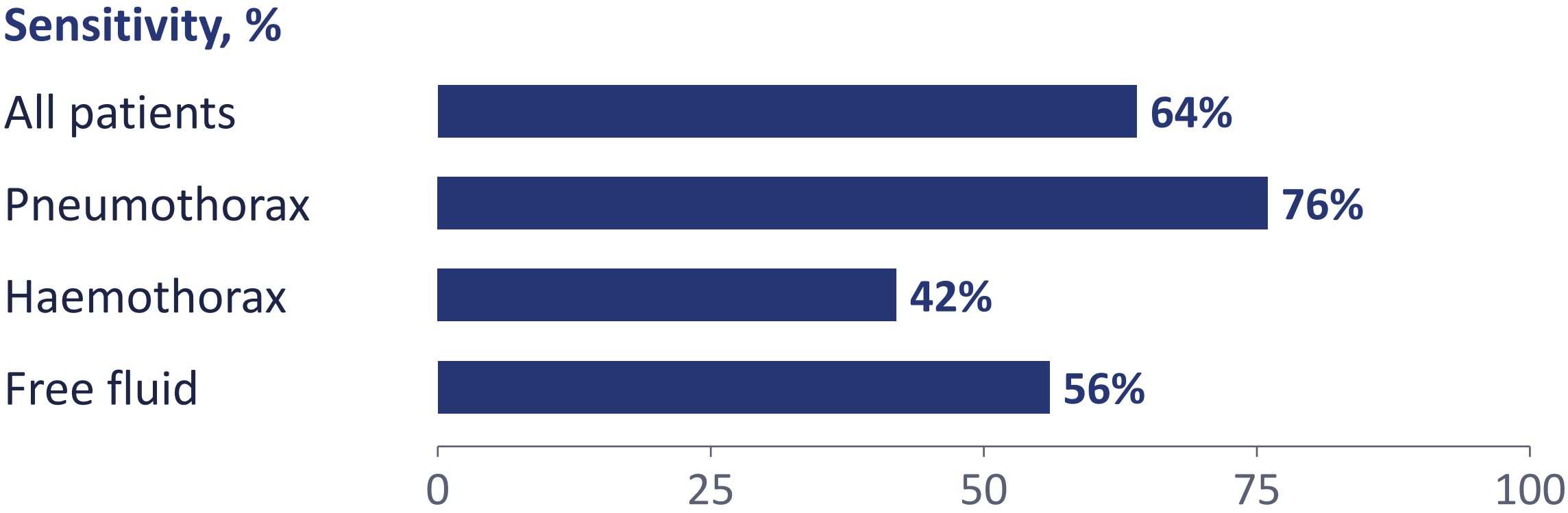
82

Anaesthetics 24% (42/178)
ICU 16% (15/95)
Emergency 9% (25/287)

Of 443 scans that included the abdomen



Sensitivity by pathology (all ultrasound scans in trauma)



Ultrasound image review

Images saved for 17 false negatives (all trauma scans)

8 were visible on images but missed

9 were not visible



3 missed pneumothorax



4 missed free fluid



1 missed haemothorax

These findings have important limitations

- Retrospective, single retrieval service
- High number of excluded scans
- Images not always saved
- Excluding trivial CT findings increases sensitivity
- No clinical parameters collected

As always with POCUS, eFAST is a good rule-in test but not a rule-out test

- Scans are less accurate in paediatric patients
- Clinician seniority and specialty don’t affect scan accuracy
- Saving images will help us understand why we miss pathology

Thank you



65.3%

sensitivity

95% CI 50–78%



96%

specificity

95% CI 92–98%