

Supplementary material

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Supplementary Table S1: Table of abnormal objective respiratory parameters considered to support acute dyspnoea at patient inclusion.

Objective parameters supporting respiratory imbalance:
Respiratory rate >20 breaths/minute
Saturation $\leq 95\%$ ($\leq 92\%$ if chronic obstructive pulmonary disease)
Abnormal pO ₂ or pCO ₂ in arterial blood
Objective signs of heart failure (i.e. jugular vein distention, peripheral oedema, orthopnoea, or bilateral rales on auscultation)
Rhonchi or prolonged breathing on auscultation

Supplementary Table S2: Diagnostic accuracy table for all included patients, using the secondary reference diagnosis (Echo-BNP AHF) as the reference.

	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	PPV (%) (95% CI)	NPV (%) (95% CI)	PLR (95% CI)	NLR (95% CI)
LUNG ULTRASOUND						
Method 1	44	88	65	76	3.72	0.63
(≥3 B-lines in one zone bilaterally)	(33-56)	(82-93)	(51-78)	(69-82)	(2.29-6.05)	(0.52-0.77)
Method 2	69	85	70	84	4.58	0.36
(≥3 B-lines in one zone bilaterally and/or bilateral PE)	(58-79)	(78-90)	(59-80)	(78-90)	(3.08-6.81)	(0.26-0.51)
Bilateral pleural effusion	53	94	83	80	9.38	0.50
	(42-64)	(90-97)	(70-92)	(73-85)	(4.81-18.27)	(0.39-0.63)
RADIOLOGY						
Chest radiography	58	92	0.78	81	7.10	0.46
	(47-69)	(86-96)	(66-88)	(75-87)	(4.08-12.34)	(0.35-0.59)
LDCT	62	97	91	83	19.90	0.39
	(51-73)	(93-99)	(80-97)	(77-88)	(8.26-47.94)	(0.30-0.52)

PPV: positive predictive value, NPV: negative predictive value, PLR: positive likelihood ratio, NLR: negative likelihood ratio, LUS Method 1: ≥one positive zone bilaterally, LUS Method 2: ≥one positive zone bilaterally and/or bilateral pleural effusion, Radiology: agreement between the two radiologists on pulmonary congestion

Supplementary Table S3: Diagnostic accuracy table for all included patients, using the combination of strict AHF and AHF and concomitant significant acute pulmonary disease, as adjudicated by pulmonologists, as the reference diagnosis.

DIAGNOSTIC MODALITY	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	PPV (%) (95% CI)	NPV (%) (95% CI)	PLR (95% CI)	NLR (95% CI)
LUNG ULTRASOUND						
Method 1 (≥3 B-lines in one zone bilaterally)	43 (33-54)	89 (83-94)	71 (57-82)	72 (65-79)	4.06 (2.42-6.83)	0.63 (0.3-0.77)
Method 2 (≥3 B-lines in one zone bilaterally and/or bilateral PE)	69 (58-78)	88 (82-93)	78 (67-86)	82 (79-88)	5.74 (3.64-9.05)	0.35 (0.26-0.48)
Bilateral pleural effusion	54 (0.44-0.65)	98 (94-100)	94 (84-99)	78 (72-84)	27.22 (8.74-84.78)	0.46 (0.37-0.58)
RADIOLOGY						
Chest radiographs	59 (48-69)	95 (91-98)	88 (77-95)	79 (73-85)	12.62 (6.00-26.54)	0.43 (0.34-0.55)
LDCT	60 (49-70)	99 (95-100)	96 (88-100)	80 (74-86)	45.00 (11.24-180.11)	0.41 (0.31-0.52)

PPV: positive predictive value, NPV: negative predictive value, PE: pleural effusion, PLR: positive likelihood ratio,

NLR: negative likelihood ratio, LUS Method 1: ≥one positive zone bilaterally, LUS Method 2: ≥one positive zone bilaterally

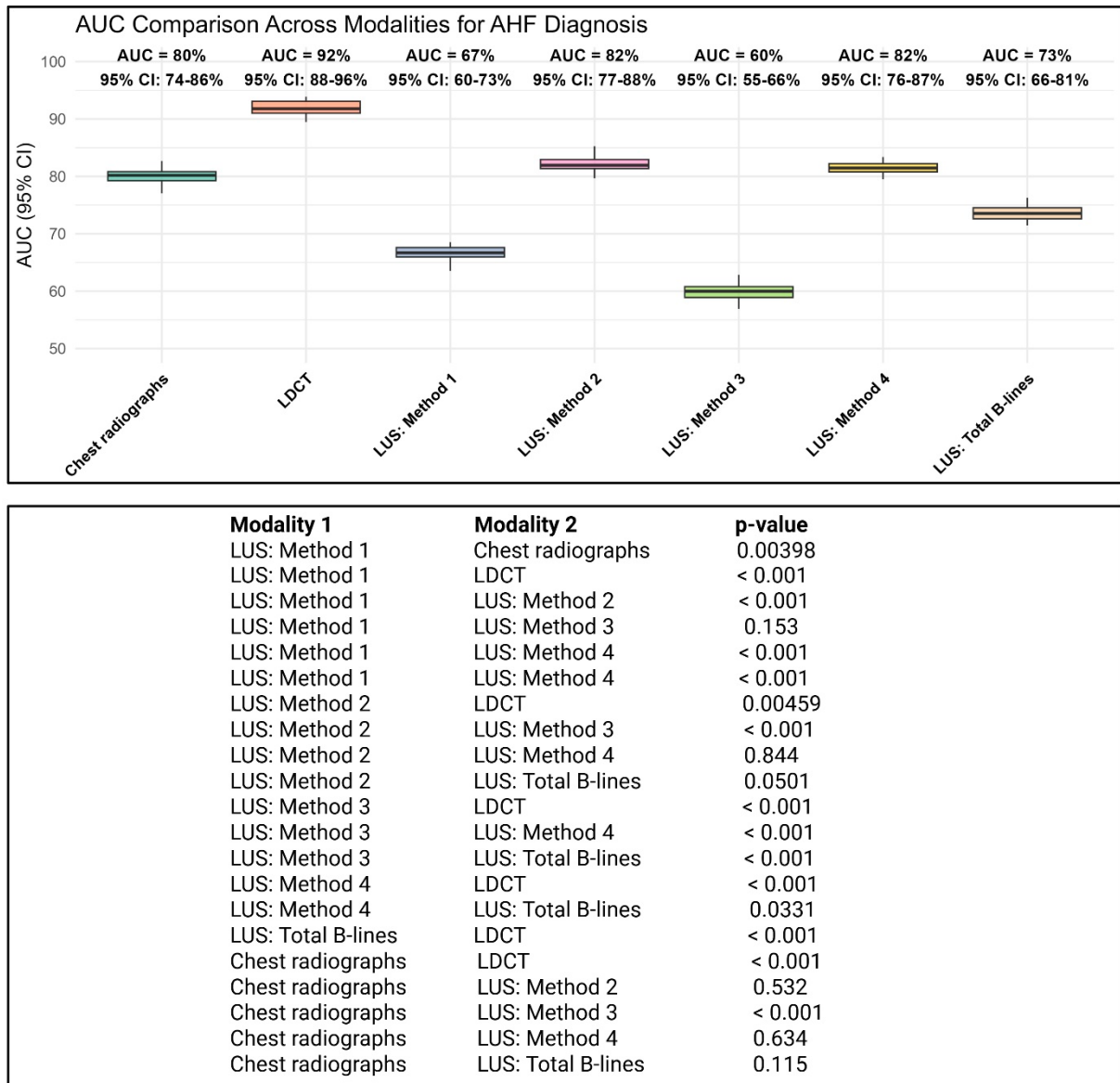
and/or bilateral pleural effusion, Radiology: agreement between the two radiologists on pulmonary congestion

Supplementary Table S4: Diagnostic accuracy table for all included patients for method 1-4 using Clinical Reference AHF, adjudicated by the cardiologists, as reference.

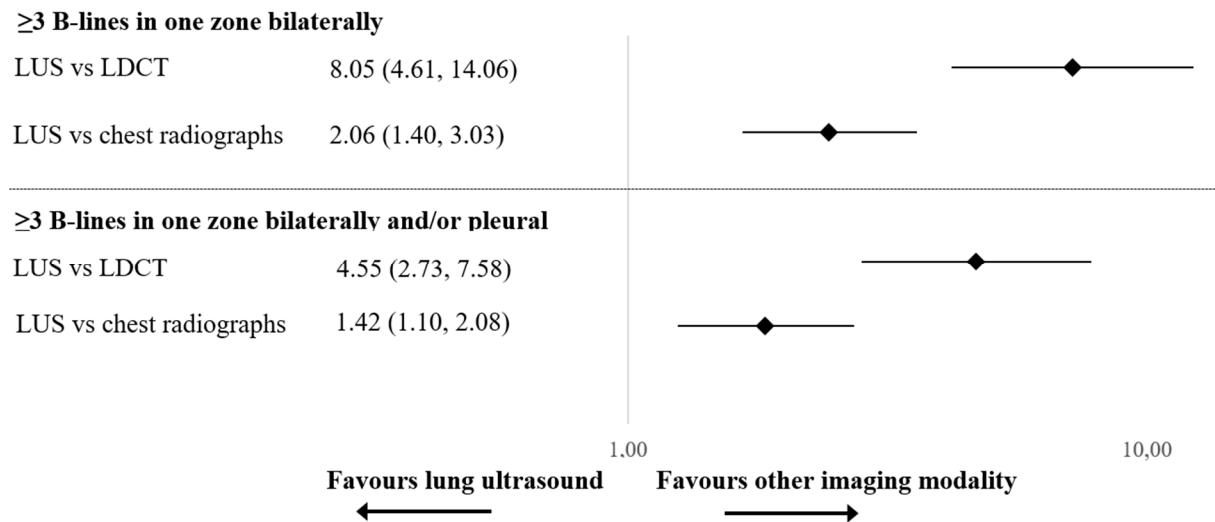
	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	PPV (%) (95% CI)	NPV (%) (95% CI)	PLR (95% CI)	NLR (95% CI)
LUNG ULTRASOUND						
Method 1 (≥3 B-lines in one zone bi- laterally)	47 (35-60)	86 (80-91)	56 (42-70)	81 (75-86)	3.41 (2.17, 5.35)	0.62 (0.49, 0.78)
Method 2 (≥3 B-lines in one zone bi- laterally and/or bilateral PE)	80 (69-89)	84 (78- 90)	66 (55-76)	92 (87- 96)	5.18 (3.59- 7.47)	0.23 (0.14- 0.38)
Method 3 (≥3 B-lines in two zones bi- laterally)	26 (16-38)	95 (90-98)	65 (44-83)	77 (71-83)	4.98 (2.34-10.61)	0.78 (0.68-0.91)
Method 4 (≥3 B-lines in two zones bi- laterally and/or bilateral pleural effusion)	71 (59-82)	92 (87-96)	77 (65-87)	89 (84-93)	8.85 (5.23-14.26)	0.31 (0.21-0.46)
Bilateral pleural effusion	65 (52-76)	95 (90-98)	83 (70-92)	88 (82-92)	12.60 (6.51-24.38)	0.37 (0.26-0.51)

PPV: positive predictive value, NPV: negative predictive value, PLR: positive likelihood ratio, NLR: negative likelihood ratio, LUS Method 1: ≥one positive zone bilaterally, LUS Method 2: ≥one positive zone bilaterally and/or bilateral pleural effusion, LUS Method 3: ≥two positive zone bilaterally, LUS Method 4: ≥two positive zone bilaterally and/or bilateral pleural effusion

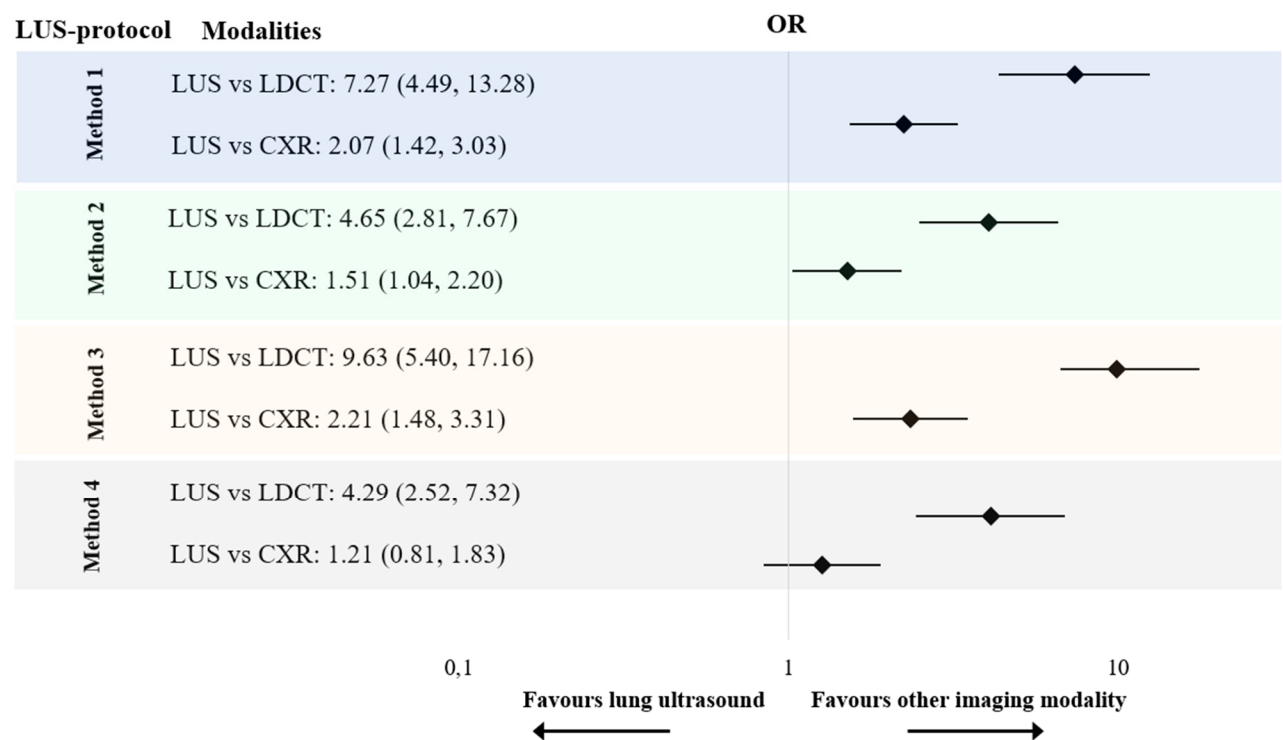
Supplementary Figure S1: AUC comparison at group level across all imaging modalities and LUS methods for the Clinical Reference AHF diagnosis. P-values provided are from comparisons at group level between AUCs using DeLong Test.



Supplementary Figure S2: Conditional odds ratio for the association between Echo-BNP AHF as reference diagnosis and the imaging modalities.



Supplementary Figure S3: Conditional odds ratio for the association for LUS in relation to Clinical Reference AHF as reference diagnosis and the different imaging modalities for method 1-4.



Supplementary Figure S4: AUC comparison at group level for AHF with concomitant acute pulmonary disease (N=91).

