



# POCUS

## -Point of care ultrasound

02.05.22

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Overlege og 1. amanuensis

Nasjonalt senter for gastroenterologisk ultrasonografi

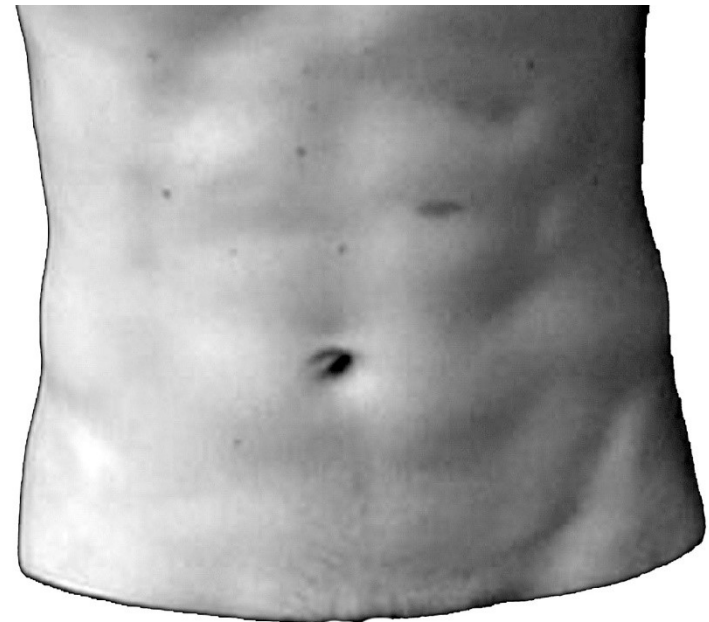
Haukeland Universitetssjukehus

Bergen



# Oversikt

- POCUS definisjon
- POCUS utstyr
- POCUS Hvorfor?
- POCUS Kasuistikker



En helt vanlig mage



En karikert ultralydprobe

# POCUS

Point Of Care UltraSonography

Målrettet ultralydundersøkelse



POCUS-selvstudium

# Ulike begreper

- POCUS
- Visual stethoscope→
- Echoscapy

Synonymer for målrettet  
ultral lyd

- BLUE-bedside lung ultrasound in emergency
- FAST-focused assessment with sonography in trauma
- Extended FAST (inkluderer lungene)
- CLUE-cardivascular limited ultrasound examination

Spesifikke metoder

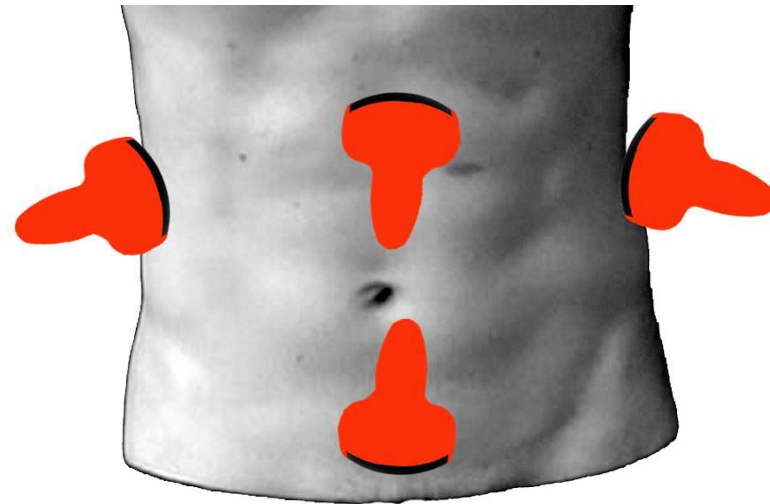


# FAST



## -Focused assessment with Sonography for Trauma

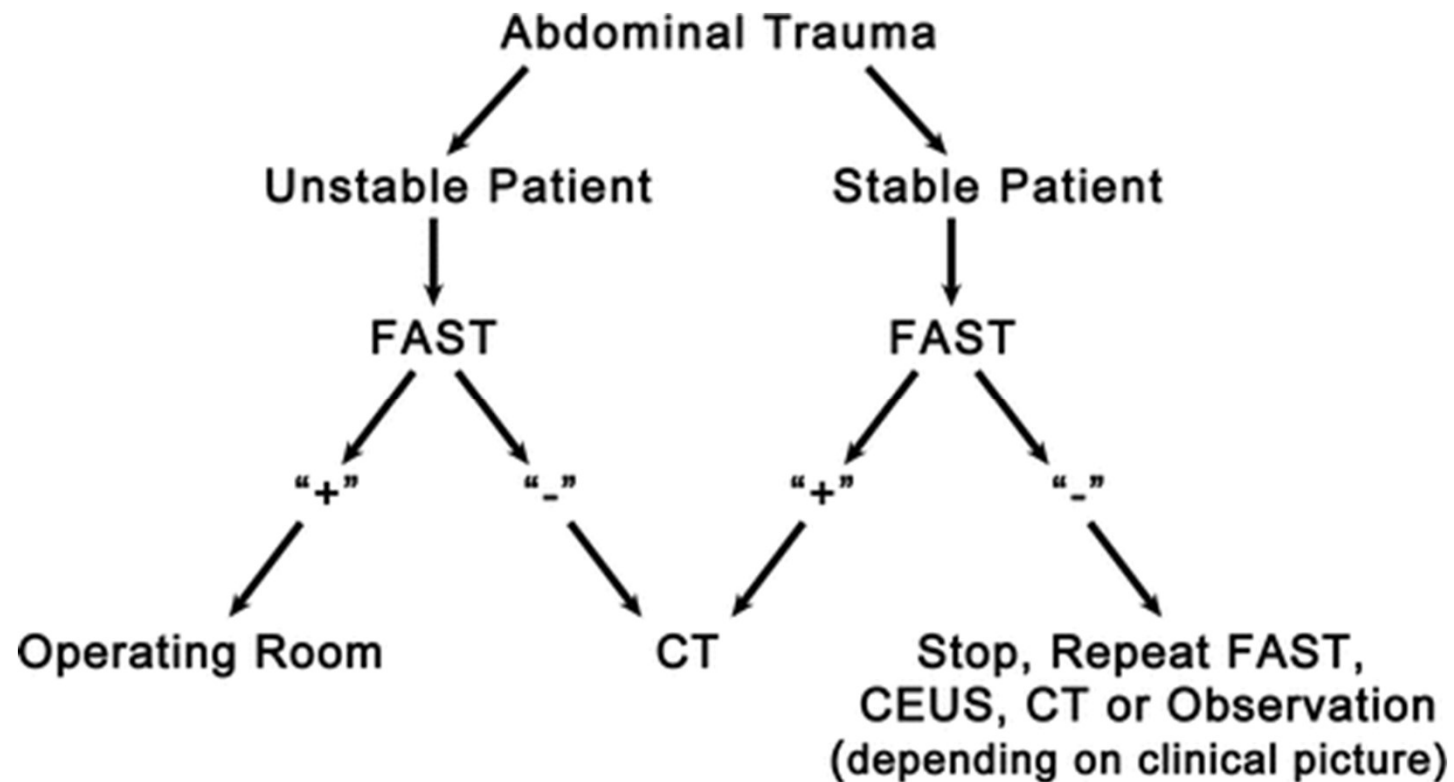
- Problemstilling:
  - Traumeutløste blødninger.
  - 4 stasjoner:
    - Subxiphoid
    - Øvre venstre kvadrant
    - Øvre høyre kvadrant
    - Suprapubisk





# FAST

-Focused assessment with Sonography for Trauma



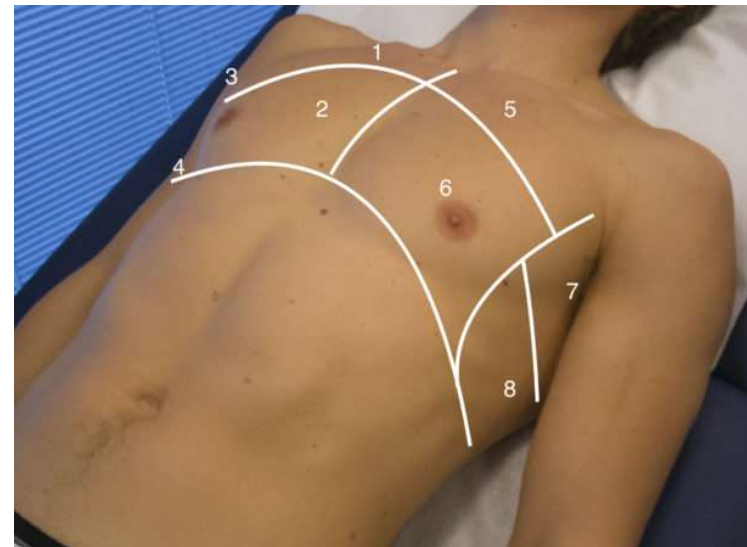


# BLUE



## -Bedside lung ultrasound in emergency

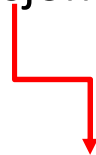
- Problemstilling:
  - Lungeødem,  
pneumoni,  
pleuravæske,  
pneumothorax





# POCUS

Klinisk informasjon



Målrettet ultralydundersøkelse



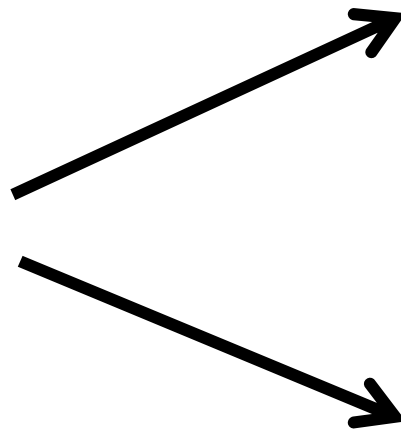
Reduksjon i antall tentative diagnoser



Spissing av videre diagnostikk

# POCUS

Et spørsmål : To svar

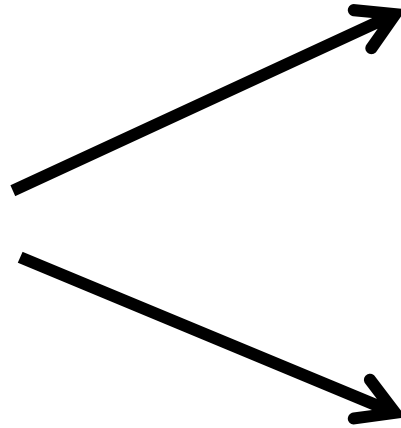


Ja

Nei

# POCUS

Et spørsmål : Acites?



Ja

Nei

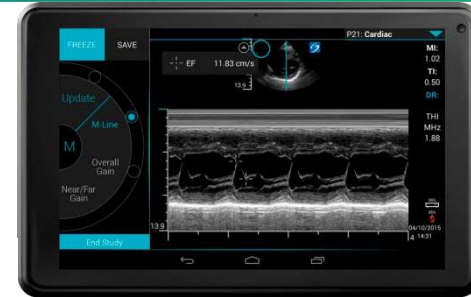
# Utstyr til POCUS



VSCAN



Logiq S8



IVIZ



# Hvorfor?



VS





# Hvorfor?



VS



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# Hvorfor?



VS





# Hvorfor?



VS





# Klinisk undersøkelse

- Lite presist
- Tilstander som lett kan sees med ultralyd er vanskelig å vurdere klinisk:
  - pleuravæske, lungeødem, pneumothorax, lungeinfiltrat med luftbronkogram, aortaaneurisme
  - dyp venetrombose
  - sentralvenetrykk (dilatert vena cava), pericardvæske, venstre ventrikkelfunksjon
  - ascites
  - urinretensjon

# POCUS vs klinisk undersøkelse

TABLE. Test Characteristics of Physical Examination vs Point-of-Care Ultrasonography

Test characteristics	Physical examination <sup>31</sup>					Point-of-care ultrasonography													
	Finding	Sensitivity	Specificity	LR+	LR-	Finding	Sensitivity	Specificity	LR+	LR-									
Pulmonary	Pleural effusion	Percussion dullness	89%	81%	4.8	0.1	Pleural fluid visualization <sup>32</sup>	93%	96%	23	0.07								
		Decreased breath sounds	88%	83%	5.2	0.1													
	Pulmonary edema Pneumonia	Crackles	19%-64%	82%-94%	3.4	NS	B lines (bilateral) <sup>33</sup>	94%	92%	10.4	0.06								
		Bronchial breath sounds	14%	96%	3.3	NS	Consolidation pattern <sup>34,35</sup>	94%-95%	90%-96%	13.5	0.06								
		Egophony	4%-16%	96%-99%	4.1	NS													
Crackles	19%-67%	36%-94%	1.8	0.8															
Cardiac	Elevated LV filling pressures	4th Heart sound	37%-71%	50%-70%	NS	NS	PCWP $\geq 17$ if MC $> 2.0$ <sup>36</sup>	75%	83%	4.4	0.3								
							MCCI $< 45\%$ <sup>36</sup>	83%	71%	2.9	0.24								
							For CVP $> 10$ mm Hg: MC size $> 2$ cm <sup>37</sup> with IVCCI $< 50\%$ <sup>38</sup>	73%	85%	4.9	0.32								
	Elevated CVP $> 8$ cm H <sub>2</sub> O	Neck vein inspection	47%-92%	93%-96%	9.7	0.3		For CVP $< 10$ mm Hg: MC $< 2$ cm <sup>39</sup> with IVCCI $> 50\%$ <sup>39</sup>	85%	81%	4.4	0.2							
								IJV aspect ratio for CVP $< 8$ <sup>40</sup>	47%	77%	2.1	0.7							
								LV systolic dysfunction <sup>41-43</sup>	78%	77%	3.5	0.3							
									84%-91%	85%-88%	6.5	0.14							
	Reduced ejection fraction $< 50\%$	3rd Heart sound	11%-51%	85%-98%	3.4	0.7													
	Congestive heart failure	Crackles	12%-23%	88%-96%	NS	NS	B lines, bilateral <sup>26</sup>	97%	95%	19.4	0.03								
												Elevated JVP	10%-58%	96%-97%	3.9	NS	For CVP $> 10$ mm Hg: MC size $> 2$ cm <sup>37</sup> with IVCCI $< 50\%$ <sup>38</sup>	73%	85%
Abdominojugular test		55%-84%	83%-98%	8.0	0.3	CVP $< 10$ mm Hg: MC $< 2$ cm <sup>39</sup> with IVCCI $> 50\%$ <sup>39</sup>	87%	82%	4.8	0.16									
	Edema										10%								
							47%	77%	2.1	0.7									

# POCUS vs klinisk undersøkelse

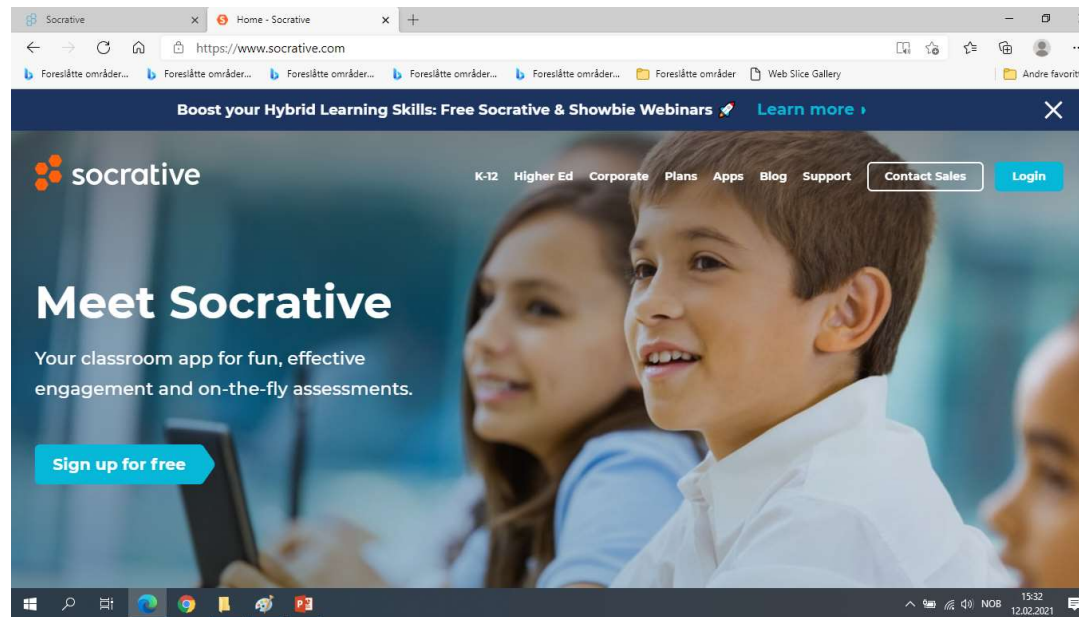
TABLE. Continued

Test characteristics	Physical examination <sup>31</sup>					Point-of-care ultrasonography				
	Finding	Sensitivity	Specificity	LR+	LR-	Finding	Sensitivity	Specificity	LR+	LR-
Abdomen										
Hepatomegaly	Percussion	61%-92%	30%-43%	NS	NS	Hepatomegaly ( $\leq 13$ or $\geq 15.5$ cm) <sup>44</sup>	82%	90%	8.2	0.2
Splenomegaly	Palpation	39%-71%	56%-85%	1.9	0.6	Splenomegaly <sup>45</sup>	100%	74%	3.8	0
	Percussion	25%-85%	32%-94%	1.7	0.7					
Bladder volume >400 mL	Palpation	82%	56%	1.9	0.3	US bladder volume >600 mL (transverse diameter >9.7 cm) <sup>46</sup>	96%	75%	3.84	0.05
Ascites	Bulging flanks	73%-93%	44%-70%	1.9	0.4	Ascites visualization <sup>47</sup>	96%	82%	32	0.04
	Flank dullness	80%-94%	29%-69%	NS	0.3					
	Shifting dullness	60%-87%	56%-90%	2.3	0.4					
	Fluid wave	50%-80%	82%-92%	5.0	0.5					
Vascular										
Lower extremity DVT	Calf swelling >2 cm	61%-67%	69%-71%	2.1	0.5	Compression venous ultrasonography <sup>48</sup>	96%	97%	32	0.04
	Homans sign	10%-54%	39%-89%	NS	NS					
	Wells score (high probability)	38%-87%	71%-99%	6.3	NA					

CVP = central venous pressure; DVT = deep vein thrombosis; IJV = internal jugular vein; IVC = inferior vena cava; ICCI = IVC collapsibility index; JVP = jugular venous pressure; LR+ = positive likelihood ratio; LR- = negative likelihood ratio; LV = left ventricle; NA = not applicable; NS = not significant; PCWP = pulmonary capillary wedge pressure; US = ultrasound.



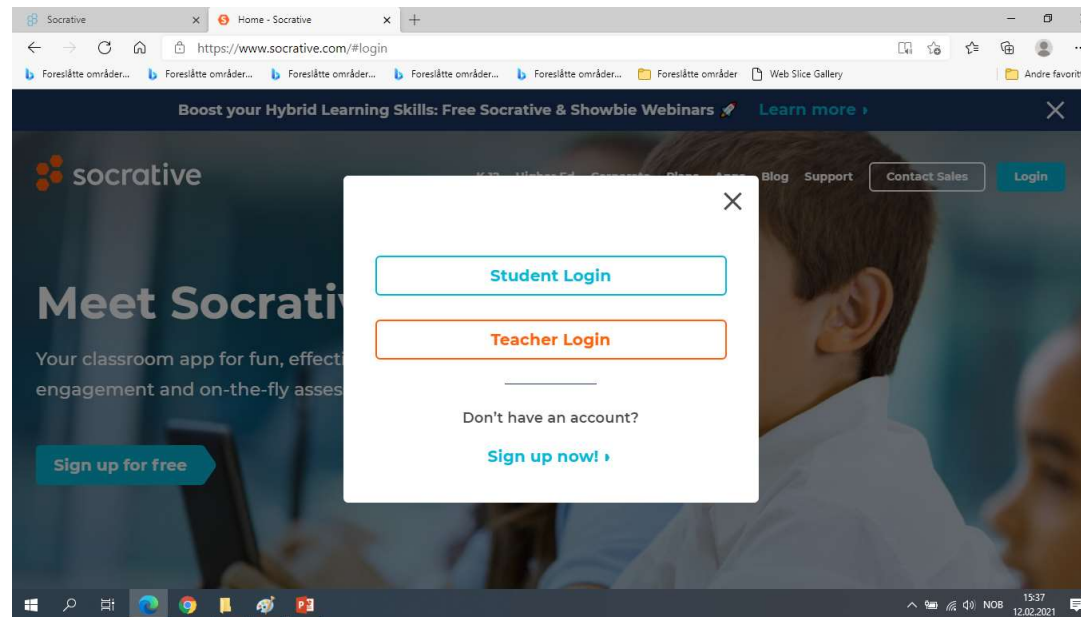
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