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## Sectie 1

### Background

Recently a consensus and expert-recommendations on ultrasound skills that should be standard in daily clinical practice was published by Robba et al. [1]. In this survey, we aim to find into what extent these skills are indeed used and which factors influence the use of critical care ultrasonography (CCUS) in daily practice.

### Critical care ultrasonography

CCUS covers ultrasonography in the critical care department where the healthcare providers managing the critically ill patients are obtaining and interpreting ultrasound images real time for clinical decision making. In this survey we focus on the use of ultrasonography for assessment of brain, lung, diaphragm, heart, abdomen and vascular ultrasonography.

## About this survey

### Aim

With this survey we aim to provide an update of the state of CCUS with regards to daily practice and training in Europe. By identification of barriers for implementation and training of CCUS in daily practice, we aim to provide recommendation for future practice.

### Privacy

All responses are saved anonymously. Collected data will be archived for 10 years. Outcomes of this survey will be shared with the European Society of Intensive Care Medicine (EISCM) and will be published in a peer-reviewed open-access journal.

More information about the privacy policy of Survalyzer: <https://survalyzer.com/privacy-policy>

The survey will take approximately 10 minutes to complete.

[1] Robba C, Wong A, Poole D, Al Tayar A, Arntfield RT, Chew MS, Corradi F, Douflé G, Goffi A, Lamperti M, Mayo P, Messina A, Mongodi S, Narasimhan M, Puppo C, Sarwal A, Slama M, Taccone FS, Vignon P, Vieillard-Baron A; European Society of Intensive Care Medicine task force for critical care ultrasonography\*. Basic ultrasound head-to-toe skills for intensivists in the general and neuro intensive care unit population: consensus and expert recommendations of the European Society of Intensive Care Medicine. Intensive Care Med. 2021 Dec;47(12):1347-1367. doi: 10.1007/s00134-021-06486-z. Epub 2021 Oct 5. PMID: 34787687; PMCID: PMC8596353.

*In this section we ask you about the extent of **your CCUS practice***

q1: What level of expertise do you have in CCUS?

Novice      Advanced      Competent      Proficient      Expert      I have no  
beginner      experience in

CCUS or  
knowledge of  
CCUS

<p>I have limited knowledge about CCUS and I have performed very few CCUS examinations</p>	<p>I have extensive knowledge about CCUS and I have performed a large amount of CCUS examinations</p>
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q2: Do you perform CCUS in critically ill patients?

- Yes
- No

Show if Question Do you perform CCUS in critically ill patients? IsEqualTo Yes

q3: How often do you use CCUS for indications other than central venous access?

- Always: multiple times a day
- Very often: around once a day
- Often: multiple times a week
- Sometimes: once a week
- Rarely: multiple times a month
- Never: do not use it

Show if Question Do you perform CCUS in critically ill patients? IsEqualTo Yes

q4: How do you use CCUS in clinical practice?

- For diagnosing
- For monitoring
- For education

Show if Question Do you perform CCUS in critically ill patients? IsEqualTo Yes

q5:

Indicate below which type of CCUS you use.

*EDEC: The European Diploma in Advanced Critical Care EchoCardiography . A curriculum in advanced critical care echocardiography offered by ESICM.*

	Yes, experienced	Yes, novice	No
Brain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lung	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Diaphragm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cardiac: basic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cardiac: EDEC level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Abdomen: trauma (FAST)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Abdomen: non-trauma	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vessels, for cannulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vessels, assessment of deep venous thrombosis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Sectie 2

*In this section we would like for you to give your **opinions and experiences with CCUS.***

**We kindly ask you to answer the questions for CCUS as a tool in general for the diagnosis, monitoring and/or guidance for invasive procedures in the ICU.**

q6: Please fill in what is applicable for CCUS in your opinion

	Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
CCUS is based on factually correct knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is clear for me what the contents of CCUS are	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is clear for me how I should perform CCUS in my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can incorporate CCUS easily in my current workflow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCUS examinations are too complex for me to perform	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCUS examinations are too complex for me to interpret	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCUS examinations are too time consuming for me to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CCUS has a clear effect on patient outcomes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think CCUS is relevant for my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think CCUS leads to better outcomes for my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

q7: I find that CCUS...

	Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
... helps me diagnose several conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... helps me to monitor my patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... helps me in clinical decision making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... helps me in education of colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... helps me to learn more about critically ill patients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... leads to faster diagnosis of several conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... leads to faster treatment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... reduces the need for additional examinations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

q8: Please fill in what is applicable for yourself in relation to CCUS.

	Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
I feel that I should incorporate CCUS as part of my clinical practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel capable to perform CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have the knowledge to use CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have enough experience to perform CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have had adequate training to use CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have appropriate certifications to use CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am informed on the contents of CCUS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

My colleagues expect me to use CCUS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find the opinions on CCUS from my colleagues important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can count on adequate assistance from my colleagues if I need help to incorporate CCUS in clinical decision making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can count on adequate assistance from my colleagues if I need help to perform CCUS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**q9: Please fill in what is applicable for your department in relation to CCUS.**

	Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
There are enough financial resources available to use CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are enough people at our department to use CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When people who use CCUS leave our department, (new) colleagues are prepared to take over	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our department allows enough time to include CCUS as intended in my day-to-day work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our department provides me with enough materials (e.g. available ultrasound machines and/or probes) necessary for the use of CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to find information in my organisation about using CCUS as intended	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At my department feedback is regularly provided about the use of CCUS for me and/or my colleagues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**q10:**

	Not a single colleague	Almost no colleagues	A minority	Half	A majority	Almost all colleagues	All colleagues
What proportion of colleagues in your organisation for whom CCUS is intended actually use CCUS?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

q11:

	No	Yes
At my department there are formal arrangements relating to the use of CCUS (in policy plans, work plans etc.)	<input type="radio"/>	<input type="radio"/>
At my department there are standardized protocols in place for the use of CCUS	<input type="radio"/>	<input type="radio"/>
There is a formal image quality assurance process in place	<input type="radio"/>	<input type="radio"/>
CCUS images can be easily archived	<input type="radio"/>	<input type="radio"/>
There are arrangements with other specialists regarding acquisition or interpretation of CCUS images (e.g. cardiology and/or radiology)	<input type="radio"/>	<input type="radio"/>
At my department one or more people have been designated to coordinate the use of CCUS	<input type="radio"/>	<input type="radio"/>

q12: Please fill in what is applicable for CCUS in relation to legislation and regulations in your country.

	Totally disagree	Disagree	Neither agree nor disagree	Agree	Totally agree
The use of CCUS fits in well with existing legislation and regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

q13: Are there any other factors which influence the use CCUS in your clinical practice? If so, please elaborate below.

\_\_\_\_\_

## Sectie 3

### *About your CCUS training and certification*

q14: Do you have recognized certification in CCUS?

- Yes. If so, specify: \_\_\_\_\_
- No

Show if	Question	Do you have recognized certification in CCUS?	IsEqualTo	No
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q15: If not, please specify why not

- Costs are too high
- No available time
- No interest in ultrasonography
- No need for formal certifications in my opinion
- No need for formal certifications at my department
- Other ....: \_\_\_\_\_

q16: Did you receive post-accreditation training in CCUS?

- Yes. If so, specify: \_\_\_\_\_
- No

q17: Does your department facilitate in-house training in CCUS?

- Yes
- No
- I do not know
- Not applicable

## EDEC

EDEC: The European Diploma in Advanced Critical Care EchoCardiography (EDEC) is a curriculum offered by ESICM.

For more information, please visit <https://www.esicm.org/education/edec-2/>

q18: What percentage (approximately) of your colleagues are EDEC certified at your department?

\_\_\_\_\_ (validation: number)

*Do not know*

q19: Do you plan to take EDEC?

- Yes
- No, I already have EDEC
- No, costs are too high
- No, no available time
- No, no interest in ultrasonography
- No, no interest in EDEC
- No, other... : \_\_\_\_\_

## Sectie 4

### ***About yourself***

q20: What is your function?

- Intensivist
- Intensivist in training
- Nurse practioner
- Nurse specialist
- Nurse
- Ultrasonographer
- Other
- Prefer not to answer

q21: What is your medical specialty?

- Anaesthesiology
- Internal medicine
- Cardiology
- Pulmonology
- Emergency medicine
- Surgery
- Neurology
- Paediatrics
- Other
- Not applicable

q22: In which country do you mainly practice?

\_\_\_\_\_

*Prefer not to answer*

q23: In what type of hospital (or other medical facility) do you mainly practice?

- General hospital

- Academic hospital
- Private hospital
- Other: \_\_\_\_\_
- Prefer not to answer

q24: What type of ICU do you mainly practice in?

- Neuro ICU
- Cardiac ICU
- Cardiothoracic ICU
- Surgical ICU
- Trauma ICU
- Medical ICU
- Mixed ICU
- Other: \_\_\_\_\_
- Prefer not to answer

q25: How many years of experience do you have in an ICU setting?

\_\_\_\_\_ (validation: number)

*Prefer not to answer*

q26: How did you learn about this survey?

- Conference
- Ultrasound course
- Non-ultrasound course
- E-mail
- Social media
- Through a colleague
- Other: \_\_\_\_\_

**Further information**

Please contact the research team if you have any questions or remarks about this survey:

*p.tuinman@amsterdamumc.nl*

Thank you very much for your participation. Your responses have been sent.