

Electronic Supplement Material

Supplement to: European Society of Intensive Care Medicine consensus statement on human-centred partnership in the intensive care unit.

Intensive Care Medicine

Jos M. Latour^{1,2,3,+,*}, Emilio Rodriguez-Ruiz^{4,5,6,*}, Yaseen M. Arabi^{7,8}, Julie Benbenishty⁹, Carole Boulanger¹⁰, Shining Cai¹¹, Maurizio Cecconi^{12,13}, Diogo da Costa Oliveira¹⁴, Alysia Coventry^{15,16,17}, Iben S. Darfelt^{18,19}, Nikolaos Efstathiou²⁰, Sabrina Eggmann^{21,22,23}, Kristina Fuest²⁴, Alessandro Galazzi²⁵, Massimiliano Greco^{12,13}, Neil Halpern²⁶, Gabriel Heras La Calle^{27,28,29}, Margaret Herridge³⁰, Joppe Jansen³¹, Amit Kansal^{32,33}, Ayda Kebapçı³⁴, Ruth Kleinpell³⁵, Cansel Kocakabak¹, Ling Liu³⁶, Annachiara Marra³⁷, Yujiro Matsuishi³⁸, Stephanie Meddick-Dyson³⁹, Victoria Metaxa⁴⁰, Rajesh Mishra^{41,42}, Anne H. Nielsen^{18,19}, Nicolas Nin⁴³, Peter Nydahl^{44,45}, Marlies Ostermann⁴⁶, Natalie Pattison^{47,48}, Annette Robertsen^{49,50}, Veronica Rojas^{27,51,52}, Sian Saha^{53,54}, Stefan J. Schaller^{55,56}, Shelley Schmollgruber⁵⁷, Evren Şentürk⁵⁸, Shahla Siddiqui⁵⁹, Robert Slappendel⁶⁰, Meta van der Woude⁶¹, Yuxia Zhang¹¹, Margo van Mol^{62*}, Jozef Kesecioglu^{63*}, Human-Centred Partnership in ICU collaborators.

Corresponding author: Jos M. Latour; jos.latour@plymouth.ac.uk

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Electronic Supplement Material 1. Rapid Review protocol

ESICM Consensus Statement on Human-Centred Partnership in ICU

Rapid Review Protocol [general for all domains to be completed by domain leads]

Core Team: Jos Latour, Margo van Mol, Emilio Rodriguez-Ruiz, Jozef Kesecioglu

Version 23 September 2025

This Rapid Review Protocol is based on Cochrane Rapid Reviews Methods Group (CRRMG): Garritty et al. Cochrane Rapid Reviews Methods Group offers evidence-informed guidance to conduct rapid reviews. *J Clin Epidemiol* 2021;130:13-22.

<https://doi.org/10.1016/j.jclinepi.2020.10.007>

The CRRMG recommends the following definition:

A rapid review is a form of knowledge synthesis that accelerates the process of conducting a traditional systematic review through streamlining or omitting specific methods to produce evidence for stakeholders in a resource-efficient manner.

1. Setting the research question and topic refinement

Develop review question(s), PICOS, and inclusion and exclusion criteria.

Domain Leads: Discuss with the Domain experts relevant review question(s) for your specified domain.

Please present the rapid review question(s) and include/exclude with to the Core team as soon as possible, the latest by 24 October 2025, for editing or approval before starting the searching and before we meet in Munich on Tuesday, 28 October 2025, 16:30hrs in Room Schliersee.

2. Setting eligibility criteria

Domain Leads: Discuss with Domain experts: Clearly define the population, intervention, comparator and outcomes.

- Limit the number of interventions and comparators.
- Limit the number of outcomes, with a focus on those most important for decision-making of the consensus statement.
- Consider date restrictions with clinical or methodological justification.
- Setting restrictions are appropriate with justification provided.
- Limit the publication language to English; add other languages only if justified.
- Systematic reviews (SRs) should be considered a relevant study design for inclusion.

- Place emphasis on higher quality study designs (e.g., SRs or RCTs); consider a stepwise approach to study design inclusion (Figure 1. Hierarchy of Evidence).

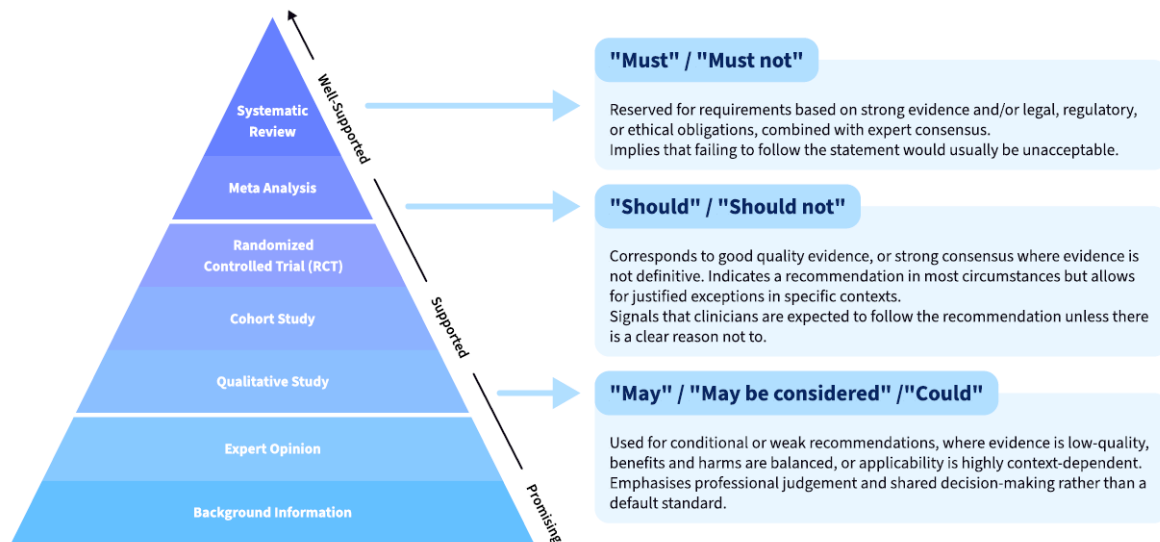


Figure 1. Hierarchy of Evidence

3. Searching

Domain leads: discuss with the Core team if support is needed or if you have librarian support at your local institution or involve an information specialist. Margo can provide support if you don't have such a specialist. Similarly, use Covidence software through one of the experts or Margo can add an Endnote file into Covidence if needed.

- Limit main database searching to MEDLINE (e.g., via PubMed) and CINAHL only.
- Consider peer review of at least one search strategy (e.g., MEDLINE).
- Limit gray literature and supplemental searching.

The search strategy for all domains is:

A. ICU population (adult, non-NICU/PICU)

("Intensive Care Units"[Mesh] OR "Critical Care"[Mesh] OR
ICU[tiab] OR "intensive care"[tiab] OR "critical care"[tiab])
AND Humans[Mesh]

NOT ("Intensive Care Units, Neonatal"[Mesh] OR "Pediatric Intensive Care Units"[Mesh] OR
neonat*[tiab] OR pediatric*[tiab] OR paediatric*[tiab])

B. Human-/patient-centred care concept

("Patient-Centered Care"[Mesh] OR patient-centered[tiab] OR patient-centred[tiab] OR
human-centered[tiab] OR human-centred[tiab] OR person-centered[tiab] OR

"user-centered"[tiab] OR "user-centred"[tiab] OR "patient experience"[tiab] OR
"experience of care"[tiab] OR dignity[tiab] OR "human factors"[tiab])

The domain leads will add the specific terms for each PICO question.

Study selection

Title and abstract screening:

- Use two reviewers for dual screen of at least 20% (ideally more) of abstracts, with conflict resolution. If necessary, discuss and refine screening process.
- Use one reviewer to screen the remaining abstracts or divide an equal number of abstracts between the experts, and another reviewer (or Domain Lead) to resolve conflicts.

Full-text screening:

- Use domain experts to screen all included full-text articles (and complete a standardized full-text form the full-text form). If doubt on include or exclude, one member or the lead will decide after reviewing that article.

4. Data extraction

- Limit data extraction to a minimal set of required data items.
- Consider using data from existing SRs to reduce time spent on data extraction.

5. Critical Appraisal Checklists

- Checklists can be found here: <https://casp-uk.net/casp-tools-checklists/>
- Use a single reviewer to complete the critical assessment of papers (if many, divide the work among Domain experts).

6. Synthesis

Domain Leads: Discuss the results of the included papers with the Domain experts and:

- Synthesize evidence narratively.

Please present the rapid review question(s) with to the Core team as soon as possible, the latest by 24 October 2025, for editing or approval before starting the search and before we meet in Munich on Tuesday 28 October 2025.

We aim to finish the rapid review at the end of December 2025.

Timeline

ESICM Consensus Statement on human-centred partnership in ICU					
Phase 1 - Rapid Reviews	2025				2026
	Sep	Oct	Nov	Dec	Jan
Define the research questions of domains					
Plan the review + rapid review protocol					
Protocols publish on Open Science Framework					
Search for evidence					
Screen and select studies					
Critically appraise the quality of studies					
Extract and synthesize data					
Assess applicability and transferability					
Report and transfer to eDelphi protocol					

Taxonomy of domains See Electronic Supplement Material 2. Taxonomy of the Domains.

Electronic Supplement Material 2. Taxonomy of the Domains

Suggested taxonomy of domains

(End of Life care issues are excluded)

1. Person-Centred Care

- Personalized care plans: Tailoring care to the individual needs, and values of patients and relatives.
- Shared Decision-Making: Involving patients and families in care decisions, ensuring they understand treatment options and risks.
- Respect for Dignity: Maintaining the patient's dignity through respectful communication, privacy, and consideration of cultural and spiritual beliefs.
- Open Visitation Policies: Allowing flexible visiting hours to help families stay connected.
- Emotional and Psychological Support: Providing resources to help families cope with stress.

2. Communication and Transparency

- Clear and Compassionate Communication: Ensuring healthcare providers communicate clearly, honestly, and empathetically with patients and families.
- Regular Updates: Providing frequent updates on the patient's condition and treatment progress.

3. Emotional Well-being

- Empathy Training: for healthcare providers to deliver care with compassion and emotional intelligence.
- Burnout Prevention: Supporting staff mental health to ensure they can provide humanized care.
- Mental Health Support: Addressing anxiety and depression through counselling, therapy, or medication.
- Post-ICU Support: Providing follow-up care for patients experiencing post-intensive care syndrome (PICS), including physical, cognitive, and emotional challenges.

4. Equity, Diversity, Inclusion

- Respecting Beliefs: Accommodating cultural, religious, and spiritual practices in care plans.
- Chaplaincy Services: Offering access to spiritual care providers for patients and families.
- Cultural Competency Training: Educating staff to provide culturally sensitive care.

5. ICU Environment

- Comfortable and Healing Spaces: Designing ICUs with natural light, quiet areas, and comfortable furniture to reduce stress and promote healing.
- Noise Reduction: Minimizing alarms and other disruptive sounds to create a calmer environment.

- Privacy: Ensuring patients have private rooms or curtains to maintain dignity and reduce anxiety.

6. Technology and Innovation

- Humanizing Technology: Using technology to enhance, not replace, human interaction (e.g., virtual visits for families who cannot be physically present).
- Patient Monitoring: Balancing the use of monitoring devices with the need for personal connection and touch.

Electronic Supplement Material 3. List of statements generated by the six domains experts after rapid reviews.

Person-Centred Care (8 statements); Communication and Transparency (8 statements); Emotional Well-being (14 statements); Equity, Diversity, Inclusion (4 statements); ICU Environment (8 statements); Technology and Innovation 11 statements)

Domain 1. (8 Statements)

Review Question 1: Concordant Care

Statement 1.1.1

Interventions of patient- and family-centred care, including family presence, communication, and participation in care, must be implemented to improve patient/family satisfaction.

Statement 1.1.2

Structured meetings between family members and healthcare professionals may be implemented to support the exploration of patient values and improving the quality of communication.

Review Question 2: Visitation Policies

Statement 1.2.1

Flexible or unrestricted visitation policies should be adopted to improve psychological health and satisfaction among family members.

Statement 1.2.2

Barriers to flexible visitation, including clinician resistance, should be identified and addressed to support consistent implementation.

Statement 1.2.3

ICUs should establish clear visitation policies to reduce uncertainty and minimise arbitrary decision-making.

Review Question 3: Participation

Statement 1.3.1

Active family participation should be supported as a therapeutic intervention that enhances patient dignity and reduces psychological burden for families.

Statement 1.3.2

Integration of families into ICU care may be supported by clearly agreed roles and organisational culture change to balance staff workload with the benefits of family involvement.

Statement 1.3.3

Family members may be educated and engaged in communication, assessment, or management of patient's symptoms to reduce their anxiety and depression.

Domain 2 (8 Statements)

Review Question 1: Concordant Care

Statement 2.1.1

Practices supporting patient identity and personhood, such as Get-To-Know-Me-Boards or animal visits, may be implemented while maintaining privacy and infection-control standards.

Review Question 2: Communication With Families

Statement 2.2.1

Structured, proactive, and standardised communication strategies, including conducting scheduled meetings and interdisciplinary conferences as well as engaging families with bedside rounds, should be implemented to improve understanding, satisfaction, and trust of families.

Statement 2.2.2

Digital and telecommunication strategies should be used as adjuncts to clinician-mediated communication with families to improve their access to information and satisfaction.

Statement 2.2.3

Interdisciplinary communication approaches should be used to improve the quality of clinician–family communication and to enhance shared decision-making.

Review Question 3: Communication Training and Processes

Statement 2.3.1

Formal communication training may be integrated into the continuous professional development of ICU professionals to enhance communication quality, build confidence, and support clinician wellbeing.

Statement 2.3.2

Structured and tailored handover processes should be used to improve team communication, efficiency, and job satisfaction.

Statement 2.3.3

Innovative communication approaches improving clinician–patient/family dialogue and optimize clinical workflow may be implemented.

Statement 2.3.4

Multicomponent family-support communication interventions with emotional or psychological components may improve long-term psychological outcomes.

Domain 3 (14 Statements)

Review Question 1: Empathy and Communication Skills

Statement 3.1.1

Family-centred communication skills training, including empathy-focused skills, should be included in the core training for ICU professionals.

Statement 3.1.2

Simulation-based empathy training may be used to improve patient and family satisfaction with ICU care.

Review Question 2: Staff Wellbeing**Statement 3.2.1**

Mindfulness-based interventions may be used to reduce burnout and improve psychosocial wellbeing and coping among ICU professionals.

Statement 3.2.2

Multicomponent initiatives, such as social connection, access to basic resources, and regular activities, may be implemented to support staff wellbeing.

Statement 3.2.3

Regular, structured, facilitated debriefing or reflective support after distressing events may be provided as part of routine staff support.

Statement 3.2.4

Multimodal simulation programmes, combining education, role-play, and debriefing, should be used to reduce job strain in ICU professionals.

Statement 3.2.5

Enhanced stress resilience training may be used to reduce stress and burnout and improve psychological and occupational wellbeing in ICU professionals.

Review Question 3: Patient Psychological Support**Statement 3.3.1**

Music-based interventions must be used to reduce anxiety and psychological distress in adult ICU patients.

Statement 3.3.2

Structured psychological or spiritual care support interventions may be used to improve mental health of ICU patients and families.

Review Question 4: Family Psychological Outcomes**Statement 3.4.1**

ICU diaries may be used to improve psychological wellbeing for families.

Statement 3.4.2

AI-management training for families may be used to improve long-term mental health of family.

Statement 3.4.3

Mobile-delivered psychological therapy may benefit families' long-term psychological outcomes.

Review Question 5: ICU Survivor Outcomes**Statement 3.5.1**

Structured post-ICU rehabilitation programmes may be considered to support psychological recovery, quality of life, and functional outcomes of ICU survivors.

Statement 3.5.2

Post-ICU follow-up programmes may be implemented to improve health outcomes, satisfaction, and quality-of-life of ICU survivors.

Domain 4 (4 Statements)

Review Question 1: Equity and Policy

Statement 4.1.1

Collaborative efforts among policymakers, ICU professionals, researchers, and patient representatives should be pursued to advance equitable care.

Review Question 2: Cultural Inclusivity

Statement 4.2.1

ICU care should be culturally inclusive and include appropriate explanations of illness, exploration of beliefs about autonomy, spirituality, and confirmation of understanding during goals-of-care discussions.

Review Question 4: EDI Training

Statement 4.4.1

Equality, Diversity and Inclusivity training of ICU professionals may be implemented to improve psychological safety and interdisciplinary collaboration.

Review Question 6: Bias and Equity

Statement 4.6.1

Training in implicit bias and cultural exchange may be provided to raise awareness and help mitigate equity-related bias among ICU professionals.

Domain 5 (8 Statements)

Review Question 1: Noise and Light Reduction

Statement 5.1.1

Visual noise-warning systems may be implemented to reduce ICU noise levels.

Statement 5.1.2

Bundles incorporating education, noise reduction, alarm management, and night-time light reduction may be implemented to improve the ICU environment.

Review Question 2: Lighting and Sleep

Statement 5.2.1

Circadian lighting systems in the ICU should be used to improve patient outcomes.

Statement 5.2.2

Ear plugs and eye masks in ICU patients may be used to improve sleep quality and/or reduce delirium.

Review Question 3: Room Design

Statement 5.3.1

Single rooms may be implemented to improve patient and family satisfaction.

Review Question 4: Windows and Sound

Statement 5.4.1

Windows with outdoor views and natural daylight in the ICU may reduce staff absenteeism and vacancy rates.

Statement 5.4.2

A sound-intervention protocol should be developed to reduce anxiety, agitation, and stress among ICU patients.

Review Question 5: Environmental Redesign

Statement 5.5.1

Environmental interventions, such as ICU room design, noise reduction, and workflow optimisation, may be implemented to reduce incidence and severity of delirium.

Domain 6 (11 statements)

Review Question 1: Virtual Visitation

Statement 6.1.1

Virtual visitation may be implemented to improve satisfaction and reduce anxiety for patients and families.

Review Question 2: Wearable Devices

Statement 6.2.1

Wearable devices may be used to support team workflows and patient mobilisation.

Review Question 3: Virtual Scribes

Statement 6.3.1

Virtual scribes using ambient AI may be used to reduce documentation time and mental workload while maintaining or improving note quality.

Review Question 4: AI-Guided Relatives' Support

Statement 6.4.1

AI-guided educational chatbots or virtual ICU guides may be implemented to increase family satisfaction and improve mental health.

Review Question 5: Dashboards and CDSS

Statement 6.5.1

AI-based dashboards and multi-patient visualisation tools may be used to improve data access, workflow efficiency, and cognitive workload.

Statement 6.5.2

Clinical decision support systems with alert-focused strategies may be implemented to reduce alert burden and cognitive workload.

Statement 6.5.3

Clinical decision support systems designed for delirium recognition and bundle adherence may be implemented to improve compliance and patient outcomes.

Review Question 6: AI-Based Monitoring**Statement 6.6.1**

Accelerometry- and vision-based sensing systems combined with machine-learning methods may be used to detect pain, sedation–agitation states, sleep–circadian disturbances, and delirium.

Review Question 8: Virtual Reality**Statement 6.8.1**

Virtual Reality-assisted cognitive stimulation interventions may be used to improve anxiety, psychological wellbeing, sleep, and pain in adult ICU patients.

Review Question 9: Augmentative Communication Tools**Statement 6.9.1**

Low-technology augmentative communication tools should be provided to non-vocal ICU patients to improve communication, satisfaction, and psychological comfort.

Statement 6.9.2

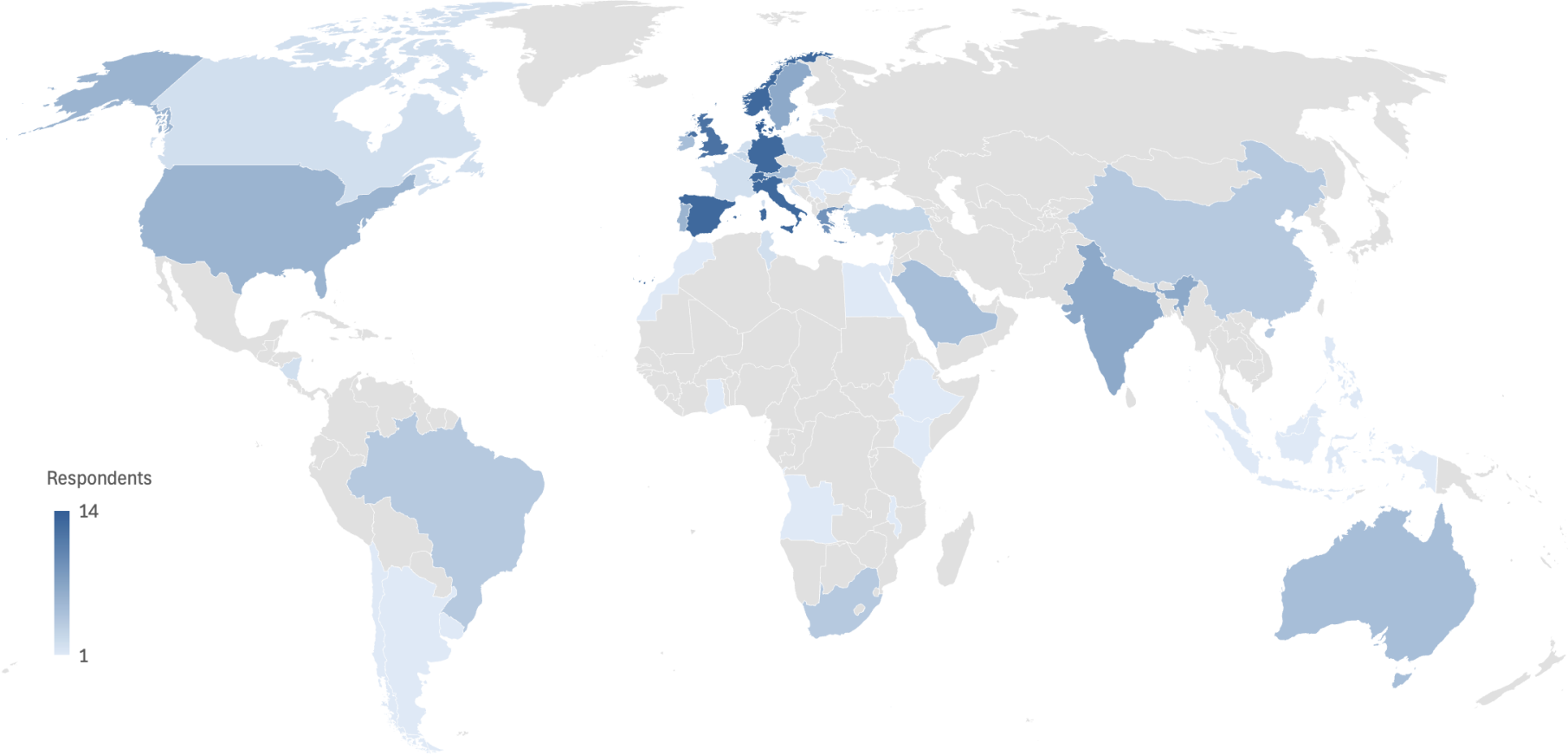
High-technology augmentative communication tools may be considered for selected patients to enhance communication effectiveness and quality of life.

Electronic Supplement Material 4. Characteristics of respondents.

Characteristics	eDelphi round 1 n = 201 (%)	eDelphi round 2 n = 149 (%)
Gender		
Female	128 (63.68)	98 (65.77)
Male	72 (35.82)	50 (33.56)
Non-binary	1 (0.50)	1 (0.67)
Age (years)		
	46 (38 - 55)	45 (37 - 55)
Country		
Austria	5 (2.49)	5 (3.36)
Belgium	3 (1.49)	3 (2.01)
Croatia	2 (1.00)	1 (0.67)
Denmark	14 (6.97)	9 (6.04)
Estonia	1 (0.50)	0 (0.00)
France	2 (1.00)	1 (0.67)
Germany	13 (6.47)	9 (6.04)
Greece	9 (4.48)	7 (4.70)
Ireland	5 (2.49)	3 (2.01)
Italy	13 (6.47)	12 (8.05)
Moldova	1 (0.50)	1 (0.67)
Netherlands	2 (1.00)	2 (1.34)
Norway	13 (6.47)	12 (8.05)
Poland	2 (1.00)	1 (0.67)
Portugal	6 (2.99)	5 (3.36)
Romania	1 (0.50)	0 (0.00)
Serbia	1 (0.50)	1 (0.67)
Spain	13 (6.47)	8 (5.37)
Sweden	7 (3.48)	7 (4.70)
Switzerland	13 (6.47)	10 (6.71)
Turkey	3 (1.49)	3 (2.01)
United Kingdom	12 (5.97)	10 (6.71)
China	4 (1.99)	4 (2.68)
India	7 (3.48)	5 (3.36)
Indonesia	1 (0.50)	1 (0.67)
Israel	2 (1.00)	2 (1.34)
Malaysia	1 (0.50)	0 (0.00)
Palestine	1 (0.50)	1 (0.67)
Philippines	1 (0.50)	0 (0.00)
Saudi Arabia	5 (2.49)	3 (2.01)
Singapore	3 (1.49)	1 (0.67)
Angola	1 (0.50)	0 (0.00)
Egypt	1 (0.50)	1 (0.67)
Ethiopia	1 (0.50)	0 (0.00)
Ghana	1 (0.50)	1 (0.67)
Kenya	1 (0.50)	0 (0.00)
Malawi	1 (0.50)	1 (0.67)
Morocco	1 (0.50)	0 (0.00)
South Africa	4 (1.99)	2 (1.34)
Tunisia	2 (1.00)	2 (1.34)
Canada	2 (1.00)	2 (1.34)
United States America	6 (2.99)	4 (2.68)
Nicaragua	2 (1.00)	1 (0.67)

Brazil	4 (1.99)	2 (1.34)
Argentina	1 (0.50)	1 (0.67)
Chile	1 (0.50)	1 (0.67)
Uruguay	1 (0.50)	0 (0.00)
Australia	5 (2.49)	4 (2.68)
Role		
Physician	92 (45.77)	63 (42.28)
Nurse	72 (35.82)	56 (37.58)
Physiotherapist	15 (7.46)	14 (9.40)
Psychologist	1 (0.50)	1 (0.67)
Other Profession	15 (7.46)	11 (7.38)
Ex-Patient	4 (1.99)	2 (1.34)
Family member	2 (1.00)	2 (1.34)
Years of experience in the ICU		
2-5	27 (13.43)	19 (12.75)
6-10	44 (21.89)	38 (25.50)
11-15	25 (12.44)	16 (10.74)
16-20	32 (15.92)	24 (16.11)
21-25	30 (14.93)	20 (13.42)
26-30	17 (8.46)	12 (8.05)
31-35	9 (4.48)	9 (6.04)
>36	8 (3.98)	6 (4.03)
NA	8 (3.98)	5 (3.36)
Abbreviations: ICU = intensive care unit. Data are expressed as the number (%).		

Electronic Supplement Material 5. Geographical distribution of respondents



Electronic Supplement Material 6. List of statements, eDelphi round 1 and round 2 results, and expert consensus meeting results.

	eDelphi Round 1 (n=201)			eDelphi Round 2 (n=149)			Expert voting (n=26)
	1-3	4-6	7-9	1-3	4-6	7-9	
DOMAIN 1. PERSON-CENTRED CARE							
Q1 Does an active attempt (i.e., communication, assessment, family involvement) to explore/identify critically ill adults' values (i.e., preferences, needs, wishes) for their care versus no active attempt (care that is focused on acute problem solving) affect patient outcomes?							
Interventions of patient- and family-centred care, including family presence, communication, and participation in care, must be implemented to improve patient/family satisfaction.	0.5%	5.9%	92.2%				
Structured meetings between family members and healthcare professionals may be implemented to support the exploration of patient values and improving the quality of communication.	0.0%	11.3%	87.3%				
Q2 Does unrestricted/ flexible (> 8 hours) versus a restricted visitation policies affect outcomes in adult ICU patients and their family members?							
Flexible or unrestricted visitation policies should be adopted to improve psychological health and satisfaction among family members	4.4%	19.6%	75.0%				
Barriers to flexible visitation, including clinician resistance, should be identified and addressed to support consistent implementation	2.9%	18.1%	77.9%				
ICUs should establish clear visitation policies to reduce uncertainty and minimise arbitrary decision-making	3.4%	11.8%	83.8%				
Q3 Do interventions that facilitate involvement and engagement in ICU adults' care versus usual care affect outcomes in adult ICU patients and their family members?							
Active family participation should be supported as a therapeutic intervention that enhances patient dignity and reduces psychological burden for families.	2.5%	12.3%	84.3%				
Integration of families into ICU care may be supported by clearly agreed roles and organisational culture change to balance staff workload with the benefits of family involvement.	4.4%	17.2%	77.5%				
Family members may be educated and engaged in communication, assessment, or management of patient's symptoms to reduce their anxiety and depression.	3.4%	23%	72.5%				
DOMAIN 2. COMMUNICATION AND TRANSPARENCY							
Q1 In adult ICU patients, do intentional, structured communication strategies designed to improve clarity, consistency, and/or timing of information, compared with usual or ad hoc communication practices, improve patient understanding, trust, satisfaction, and psychological well-being?							
Practices supporting patient identity and personhood, such as Get-To-Know-Me-Boards or animal visits, may be implemented while maintaining privacy and infection-control standards*	6.9%	24.5%	67.2%				

Practices supporting patient identity and personhood, such as the patient's Get-To-Know-Me-Boards, may be implemented while maintaining privacy.				2.0%	23.5%	74.5%	
Q2 In ICU healthcare settings, do structured or intentional communication strategies for families, compared with usual or ad hoc communication practices, improve communication quality, family understanding, satisfaction, and psychological well-being?							
Structured, proactive, and standardized communication strategies, including conducting scheduled meetings and interdisciplinary conferences as well as engaging families with bedside rounds, should be implemented to improve understanding, satisfaction, and trust of families.	5.9%	22.1%	71.1%				
Digital and telecommunication strategies should be used as adjuncts to clinician-mediated communication with families to improve their access to information and satisfaction.	3.4%	24.0%	71.6%				
Interdisciplinary communication approaches should be used to improve the quality of clinician–family communication and to enhance shared decision-making.	3.4%	10.3%	85.3%				
Q3 In ICU healthcare professionals, do structured communication-related interventions compared with usual practice improve communication quality, professional well-being, and team functioning?							
Formal communication training may be integrated into the continuous professional development of ICU professionals to enhance communication quality, build confidence, and support clinician well-being.	2.0%	11.3%	85.8%				
Structured and tailored handover processes should be used to improve team communication, efficiency, and job satisfaction.	0.0%	12.7%	85.8%				
Innovative communication approaches improving clinician–patient/family dialogue and optimize clinical workflow may be implemented.	2.5%	22.1%	74.5%				
Multicomponent family-support communication interventions with emotional or psychological components may improve long-term psychological outcomes.	3.4%	14.7%	80.9%				
DOMAIN 3. EMOTIONAL WELL-BEING							
Q1 Does participation in empathy-based communication training for ICU clinicians improve family/patient satisfaction with communication compared to usual practice?							
Family-centred communication skills training, including empathy-focused skills, should be included in the core training for ICU professionals.	2.0%	9.3%	87.7%				
Simulation-based empathy training may be used to improve patient and family satisfaction with ICU care.	4.4%	25.5%	69.1%				
Simulation based empathy training may be organised for ICU healthcare professionals to improve patient and family satisfaction with ICU care.				2.0%	28.9%	69.1%	84%
Q2 In adult ICU staff, do interventions designed to promote well-being or resilience, or to reduce burnout, compared with usual staff support, improve well-being or resilience and reduce burnout?							
Mindfulness-based interventions may be used to reduce burnout and improve psychosocial well-being and coping among ICU professionals.	8.8%	26.5%	63.2%				
Mindfulness based interventions may be used to reduce burnout and improve psychosocial well-being and coping among ICU professionals.				5.4%	31.5%	63.1%	
Multicomponent initiatives, such as social connection, access to basic resources, and regular activities, may be implemented to support staff well-being.	4.5%	25.2%	70.3%				
Regular, structured, facilitated debriefing or reflective support after distressing events may be provided as part of routine staff support.	1.5%	9.3%	88.2%				
Multimodal simulation programmes, combining education, role-play, and debriefing, should be used to reduce job strain in ICU professionals.	5.9%	22.1%	71.1%				

Enhanced stress resilience training may be used to reduce stress and burnout and improve psychological and occupational well-being in ICU professionals.	3.4%	21.1%	74.5%				
Q3 Does providing pro-active psychology support or anti-depressants in ICU to patients at risk of depressive symptoms improve long-term (3 or more months) psychological outcomes of depression and anxiety compared to no formalised support/interventions?							
Music-based interventions must be used to reduce anxiety and psychological distress in adult ICU patients.	9.8%	30.9%	57.8%				
• Music based interventions must be used to reduce anxiety and psychological distress in adult ICU patients				8.7%	33.6%	57.7%	
Structured psychological or spiritual care support interventions may be used to improve mental health of ICU patients and families.	3.4%	19.6%	76%				
Q4 Does providing pro-active psychology support to families in ICU improve long-term psychological outcomes of depression and anxiety for informal caregivers, compared to usual care?							
ICU diaries may be used to improve psychological well-being for families.	4.4%	23%	71.6%				
Stress-management training for families may be used to improve long-term mental health of family.	6.4%	27.5%	64.7%				
• Stress management training for families may be used during ICU stay to improve long-term mental health of family.				3.4%	32.2%	64.4%	
Mobile-delivered psychological therapy may benefit families' long-term psychological outcomes.	7.8%	34.8%	56.4%				
• Mobile-delivered psychological therapy may be implemented to benefit families' long term psychological outcomes.				5.4%	35.6%	59.1%	
Q5 In post-ICU survivors, does participation in a post-ICU recovery/follow-up programme or clinic improve well-being, QoL and psychological outcomes compared to no recovery clinic/follow-up?							
Structured post-ICU rehabilitation programmes may be considered to support psychological recovery, quality of life, and functional outcomes of ICU survivors.	1.5%	6.4%	91.7%				
Post-ICU follow-up programmes may be implemented to improve health outcomes, satisfaction, and quality-of-life of ICU survivors.	0.0%	7.8%	91.2%				
DOMAIN 4. EQUITY, DIVERSITY, INCLUSION							
Q1 What strategies or interventions most effectively promote equity in access, treatment, and outcomes for patients and families in critical care settings?							
Collaborative efforts among policymakers, ICU professionals, researchers, and patient representatives should be pursued to advance equitable care.	2.0%	12.7%	84.3%				
Q2 In critically ill diverse patient populations, what constitutes inclusive & culturally responsive care versus non-inclusive care that improves patient outcomes?							
ICU care should be culturally inclusive and include appropriate explanations of illness, exploration of beliefs about autonomy, spirituality, and confirmation of understanding during goals-of-care discussions.	1.5%	12.7%	84.8%				
Q3 Does training in equity, diversity, and inclusion (EDI) principles improve interdisciplinary team collaboration, psychological safety, and equitable participation in critical care units?							
Equity, Diversity and Inclusivity training of ICU professionals may be implemented to improve psychological safety and interdisciplinary collaboration.	3.9%	17.2%	77.9%				
Q4 What interventions or educational approaches are most effective in increasing awareness and mitigation of equity-related bias among critical care staff?							
Training in implicit bias and cultural exchange may be provided to raise awareness and help mitigate equity-related bias among ICU professionals.	3.9%	19.6%	75.5%				
DOMAIN 5. ICU ENVIRONMENT							
Q1 Does a noise-reduction concept (e.g., noise-warning systems, noise reduction using alarm management, silent ICU concepts and quiet hours, ear plugs) bundled with educational interventions versus usual care improve patient-centric outcomes in adult ICU patients?							

Visual noise-warning systems may be implemented to reduce ICU noise levels.	5.4%	17.6%	76.0%				
Bundles incorporating education, noise reduction, alarm management, and nighttime light reduction may be implemented to improve the ICU environment.	2.0%	8.3%	89.2%				
Q2 Does a circadian lighting system versus standard lighting improve patient outcomes in adult ICU patients?							
Circadian lighting systems in the ICU should be used to improve patient outcomes.	2.5%	17.6%	78.9%				
Ear plugs and eye masks in ICU patients may be used to improve sleep quality and/or reduce delirium.	3.4%	20.6%	75.0%				
Q3 Do single-patient ICU rooms, compared with multibed or open bays, improve patient outcomes?							
Single rooms may be implemented to improve patient and family satisfaction.	4.4%	18.6%	76.0%				
Q4 Do biophilic/healing design elements versus standard décor improve patient outcomes or comfort and family satisfaction in adult ICUs?							
Windows with outdoor views and natural daylight in the ICU may reduce staff absenteeism and vacancy rates.	2.9%	17.6%	78.4%				
A sound-intervention protocol should be developed to reduce anxiety, agitation, and stress among ICU patients.	3.4%	20.1%	75.0%				
Q5 Do bundled ICU environmental redesigns versus pre-implementation baseline improve patient outcomes, experience, or family satisfaction?							
Environmental interventions, such as ICU room design, noise reduction, and workflow optimisation, may be implemented to reduce incidence and severity of delirium.	1.0%	11.3%	86.8%				
Q6 Does animal therapy during the ICU stay improve patient outcomes, experience, or family satisfaction?							
The animal therapy during the ICU stay may be implemented to improve patient outcomes, experience, and family satisfaction.				16.8%	34.9%	48.3%	
DOMAIN 6. TECHNOLOGY AND INNOVATION							
Q1 In adult ICU patients, does the use of virtual-visitation systems (video calls), compared with routine ICU family visit policy, improve patient or family satisfaction or reduce anxiety and PTSD outcomes?							
Virtual visitation may be implemented to improve satisfaction and reduce anxiety for patients and families.	10.8%	24.5%	63.2%				
Virtual family visitation may be implemented alongside open family visitation to improve satisfaction and reduce anxiety for patients and families.				2.0%	12.8%	85.2%	
Q2 In adult ICU patients, do wireless or contactless wearable sensors, compared with routine monitoring device, improve patient mobilization and comfort while reducing complications or staff burden?							
Wearable devices may be used to support team workflows and patient mobilisation.	6.9%	26.0%	65.7%				
Wearable monitors or sensors for patients may be used to support team workflows and patient mobilisation.				4.7%	28.9%	66.4%	62%
Q3 Among adult ICU healthcare teams, does virtual scribes, compared with routine ICU note taking, reduce burnout and cognitive workload, and improve handover quality?							
Virtual scribes using ambient AI may be used to reduce documentation time and mental workload while maintaining or improving note quality.	8.3%	26.0%	64.7%				
Virtual scribes using ambient AI may be used to reduce documentation time and mental workload while maintaining or improving note quality.				5.4%	30.2%	64.4%	
Q4 In families of adult ICU patients, do AI-guided educational chatbots or virtual ICU guides, compared with standard verbal or printed information, improve family satisfaction, and reduce anxiety/PTSD?							
AI-guided educational chatbots or virtual ICU guides may be implemented to increase family satisfaction and improve mental health.	13.7%	32.8%	52.0%				
AI-guided educational chatbots or virtual ICU guides may be implemented to increase family satisfaction and improve mental health.				11.4%	42.3%	46.3%	

Q5 In adult ICU healthcare teams, do AI-based dashboards and Clinical Decision Support systems, compared with routine ICU data interfaces, improve situational awareness or reduce mental fatigue?							
AI-based dashboards and multi-patient visualisation tools may be used to improve data access, workflow efficiency, and cognitive workload.	7.8%	27.9%	63.2%				
AI-based dashboards and multi-patient visualisation tools may be used to improve data access, workflow efficiency, and cognitive workload.				8.7%	30.2%	61.1%	
Clinical decision support systems with alert-focused strategies may be implemented to reduce alert burden and cognitive workload.	4.9%	27.0%	67.2%				
Clinical decision support systems with alert-focused strategies may be implemented to reduce alert burden and cognitive workload.				2.0%	20.1%	77.9%	
Clinical decision support systems designed for delirium recognition and bundle adherence may be implemented to improve compliance and patient outcomes.	3.4%	19.6%	76.0%				
Q6 In adult ICU patients unable to communicate, does AI-driven video or actigraphy analysis for delirium and pain detection, compared with routine detection scales, improve detection of delirium and pain?							
Accelerometry- and vision-based sensing systems combined with machine-learning methods may be used to detect pain, sedation–agitation states, sleep–circadian disturbances, and delirium.	6.9%	29.4%	62.7%				
Accelerometry- and vision-based sensing systems combined with machine-learning methods may be used to detect pain, sedation–agitation states, sleep–circadian disturbances, and delirium.				5.4%	27.5%	67.1%	58%
Q7 In adult ICU patients, does the use of virtual reality, compared with routine ICU care, improve psychological outcomes, sleep, cognitive outcomes, pain or rehabilitation?							
Virtual Reality-assisted cognitive stimulation interventions may be used to improve anxiety, psychological well-being, sleep, and pain in adult ICU patients.	9.8%	28.9%	59.8%				
Virtual Reality-assisted cognitive stimulation interventions may be used to improve anxiety, psychological well-being, sleep, and pain in adult ICU patients.				6.0%	30.9%	63.1%	
Q8 In adult ICU patients, does the use of eye tracking or new techniques for communication, compared with routine ICU care, reduce, psychological distress, sedation needs, and PTSD?							
Low-technology augmentative communication tools should be provided to non-vocal ICU patients to improve communication, satisfaction, and psychological comfort.	2.5%	14.7%	81.9%				
High-technology augmentative communication tools may be considered for selected patients to enhance communication effectiveness and quality of life.	2.9%	22.1%	73.5%				
Abbreviations: ICU = intensive care unit. Data are expressed as percentages (%). Statements were rated on a 9-point Likert scale based on their perceived importance. * Based in comments from eDelphi round 1, this statement was split in 2 different statements.							