2025 International Symposium on Intensive Care and Emergency Medicine Roundtable: A Roadmap for Disorders of Consciousness

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2025 ISICEM Round Table Highlights

- **18 global experts** reviewed latest evidence on acute Disorders of Consciousness (DoC):
  - Epidemiology
  - Diagnosis
  - Treatment
  - Prognosis

- Developed a **6-step roadmap**: Patient Identification
  - Assessment & Diagnosis
  - Treatment Strategies
  - Prognostic Evaluation
  - Family Communication
  - Shared Decision-Making

- **Key Deliverables**:
  - Actionable recommendations for clinical practice
  - Highlight scientific advances
  - Discuss research roadmap

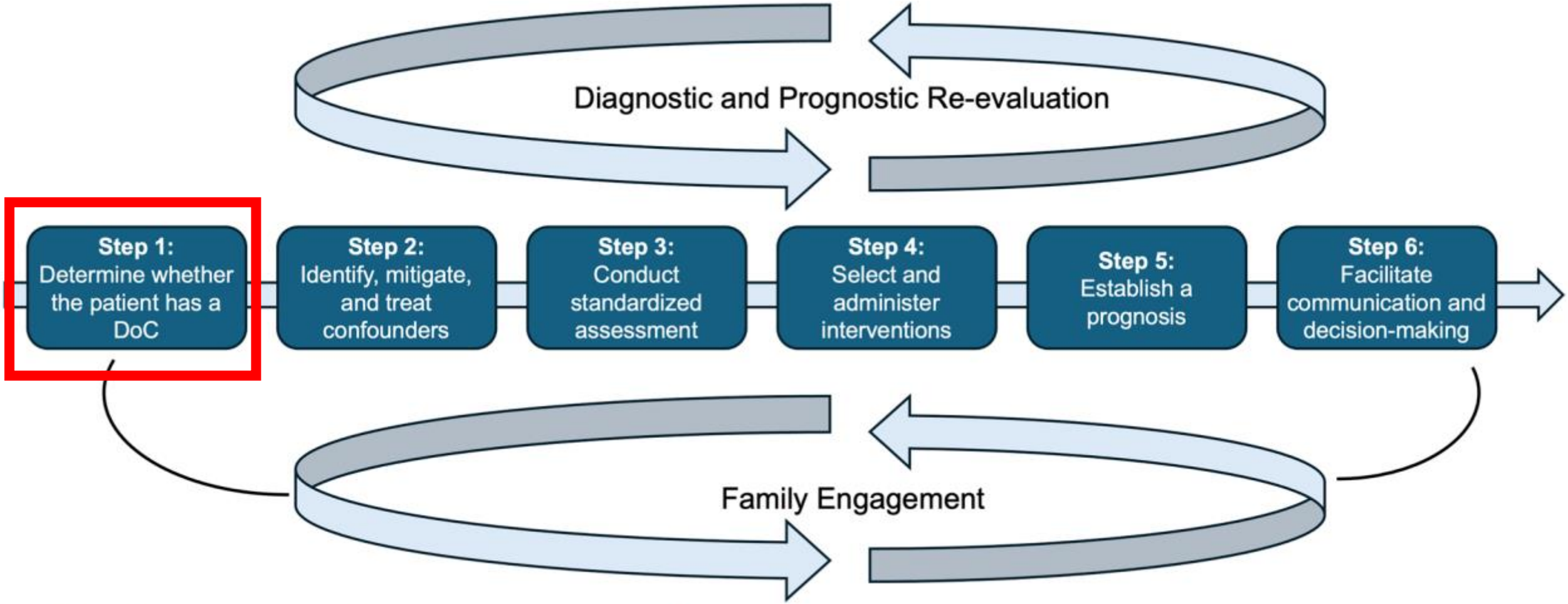


Fig. 1 A roadmap for acute disorders of consciousness (DoC) clinical care

1. Determine Whether the Patient has a DOC

❖ **Challenges in Recognition**

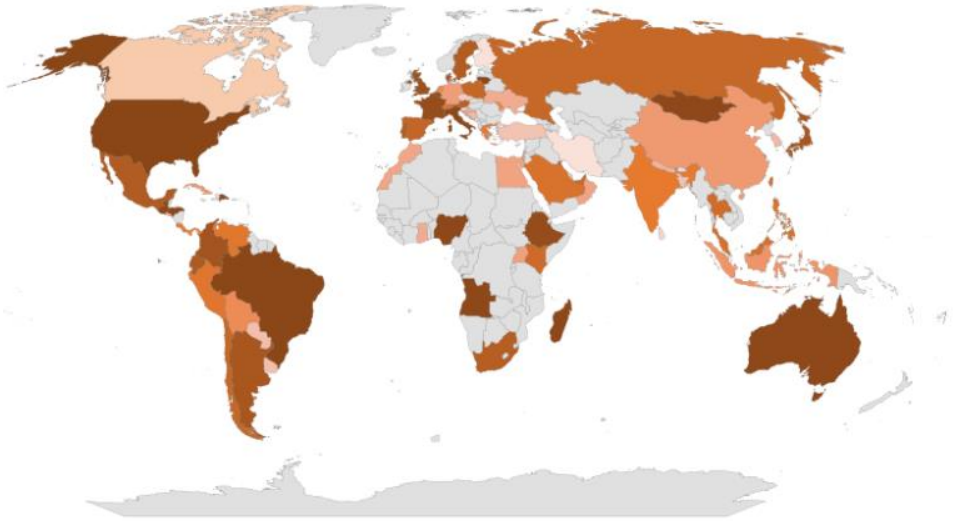
- No universal standard: Assessment tools vary widely across centers
- High error rate: Misdiagnosis occurs in ~40% of cases
- Unrecognized confounders: Sedation, analgesics, septic/metabolic derangements, language barriers
- Dynamic state: Awareness fluctuates - serial evaluations are critical to avoid false negatives

1. Determine Whether the Patient has a DOC

❖ Challenges in Recognition

- Term “coma” is ambiguous: Often defined by GCS score 3–8, but this spans:
  - Patients with absent sleep–wake cycles (eye closure, no response)
  - Patients showing MCS behaviors (visual pursuit, command-following)
- GCS was designed for TBI severity, not consciousness diagnosis
- Current ICU practice gaps: Rare use of standardized tools (e.g., CRS-R)
- No systematic approach for:
  - Screening DoC
  - Serial evaluations
  - Data collection

Definition of Coma



- **Substantial heterogeneity** in how healthcare professionals define coma
- In the Curing Coma Campaign's COME TOGETHER survey (involving258 healthcare professionals from 41 countries) , only 64% of global experts agreed on the proposed 6-point definition.
- Absence of wakefulness was the only criterion with highest agreement (81%)
- Findings underscore the need for evidence-based guidelines and a collaborative, coordinated approach to standardize coma definitions globally

CURING COMA®
AWAKENING HOPE

Criteria to Define Coma (COME-TOGETHER survey)

1.No command-following

2.No intelligible speech or recognizable gesture

3.No volitional movement (reflexive movement such as extensor or flexor posturing, withdrawal from pain, triple flexion may occur)

4.No visual pursuit, fixation, saccade to stimuli, or eye opening/closing to command

5.The above criteria are not due to use of paralytic agent, active use of sedatives, another neurologic or psychiatric disorder (e.g., locked-in syndrome, neuromuscular disorder, catatonia, akinetic mute, abulia, conversion disorder)

6.The patient does not have evidence of cognitive motor dissociation (i.e., covert ability to follow commands) based on electrophysiological or functional imaging, if such testing is available

DOC Spectrum

Table 1 Overview of terminology and diagnostic criteria commonly used in patients with disorders of consciousness

Diagnosis	Wakefulness	Behavioural responsiveness	Key behaviours
Coma	Absent	Absent or reflexive	None
Vegetative state (VS)/unresponsive wakefulness syndrome (UWS)	Present	Absent or reflexive	Eye-opening, no purposeful responses
Minimally conscious state minus (MCS−)	Present	Present, without language function	Visual pursuit, localization to pain, automatic motor responses
Minimally conscious state plus (MCS+)	Present	Present, with language function	Command-following, intelligible expression
Emerged from MCS (eMCS)	Present	Present, with or without language function	Accurate yes/no communication, functional object use

1. Determine Whether the Patient has a DOC Research Priorities

- **Opportunities**:
  - ICD-11 now includes codes for VS/UWS, MCS–, MCS+
  - Crowdsourced estimates highlight need for rigor:
    - **Incidence**: 135–258 per 100,000/year
    - **Prevalence**: 7–31 per 100,000

- **Call to Action**:
  - Develop systematic screening & serial assessments
  - Conduct robust epidemiological studies on incidence, prevalence, determinants

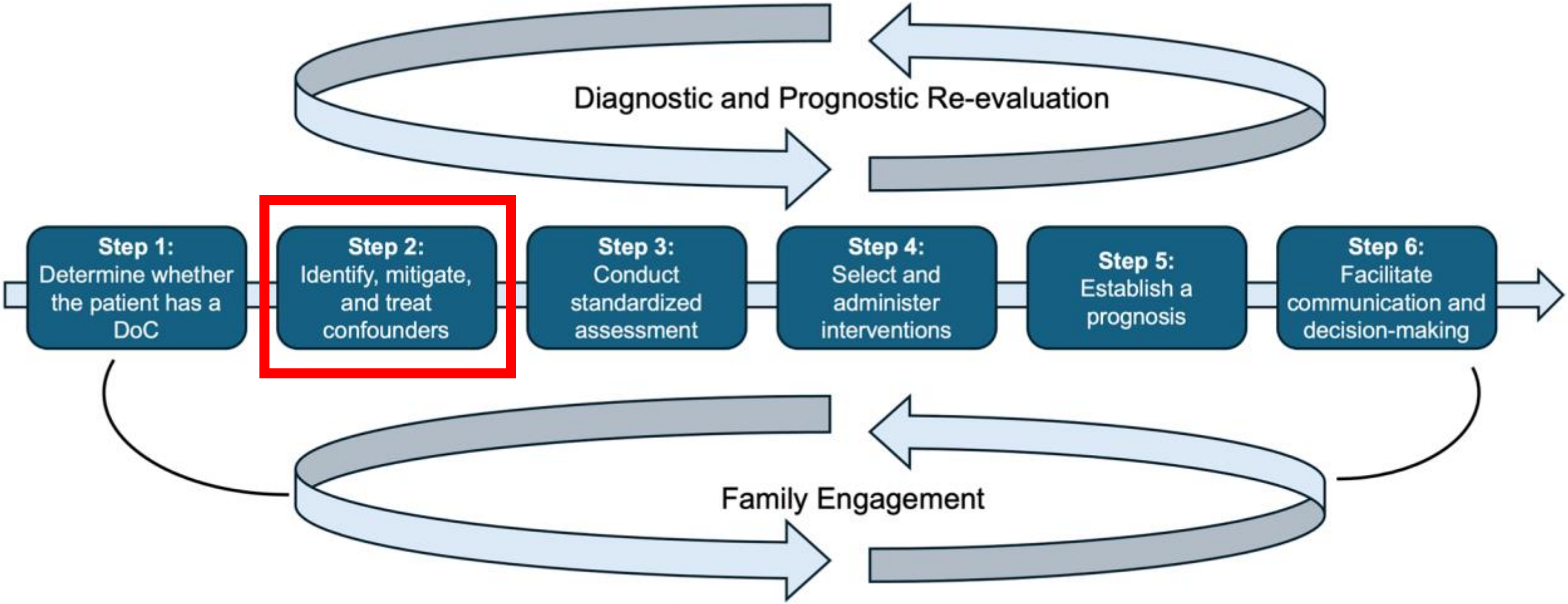


Fig. 1 A roadmap for acute disorders of consciousness (DoC) clinical care

2. Identify, Mitigate and Treat Confounders

❖**ICU & DoC Care: Key Priorities**

- **Maintain Homeostasis**
  - Oxygenation, ventilation, hemodynamic stability
- **Prevent & Detect Complications**
  - Medical: infections, VTE, ulcers
  - Iatrogenic: sedation, drug interactions
- **Address Reversible Factors**
  - Pain, hydrocephalus, seizures, infections, metabolic issues
  - Sedation & language impairments can mask consciousness
- **Seizure Management**
  - Common post-brain injury
  - Many are subclinical → require EEG monitoring and strict management protocols

2. Identify, Mitigate and Treat Confounders

❖ **Confounders & Contributors to DoC**

- **Common Confounders**
  - Sedation, analgesics, fever → mask awareness
- **Polypharmacy Risks**
  - Drug interactions, impaired clearance (renal/hepatic)
- **Secondary Brain Injury Factors**
  - Glycemic & electrolyte imbalances
  - Renal/hepatic dysfunction
  - Endocrine issues (thyroid, adrenal, pituitary)
- **Other Complications**
  - Nutritional deficits, GI dysfunction
  - Immobility: contractures, pressure injuries
- **Environmental/Iatrogenic Factors**
  - Noise, light, sleep disruption, lack of stimulation
- **Solution**: **Multidisciplinary approach**
  - Intensivists, neurologists, rehab specialists, nurses, allied health

2. Identify, Mitigate and Treat Confounders Research Priorities

❖**Sedation: A Key Confounder in DoC Assessment**

- **Impact**: Sedation can mask arousal → diagnostic uncertainty
- **Current Gaps**:
  - No clear approach to assess sedation's effect on daily exams
  - No guidelines on optimal timing for clinical assessment post-sedation
- **Research Need**:
  - Prospective studies to identify ICU factors, hospital events, and complications contributing to DoC

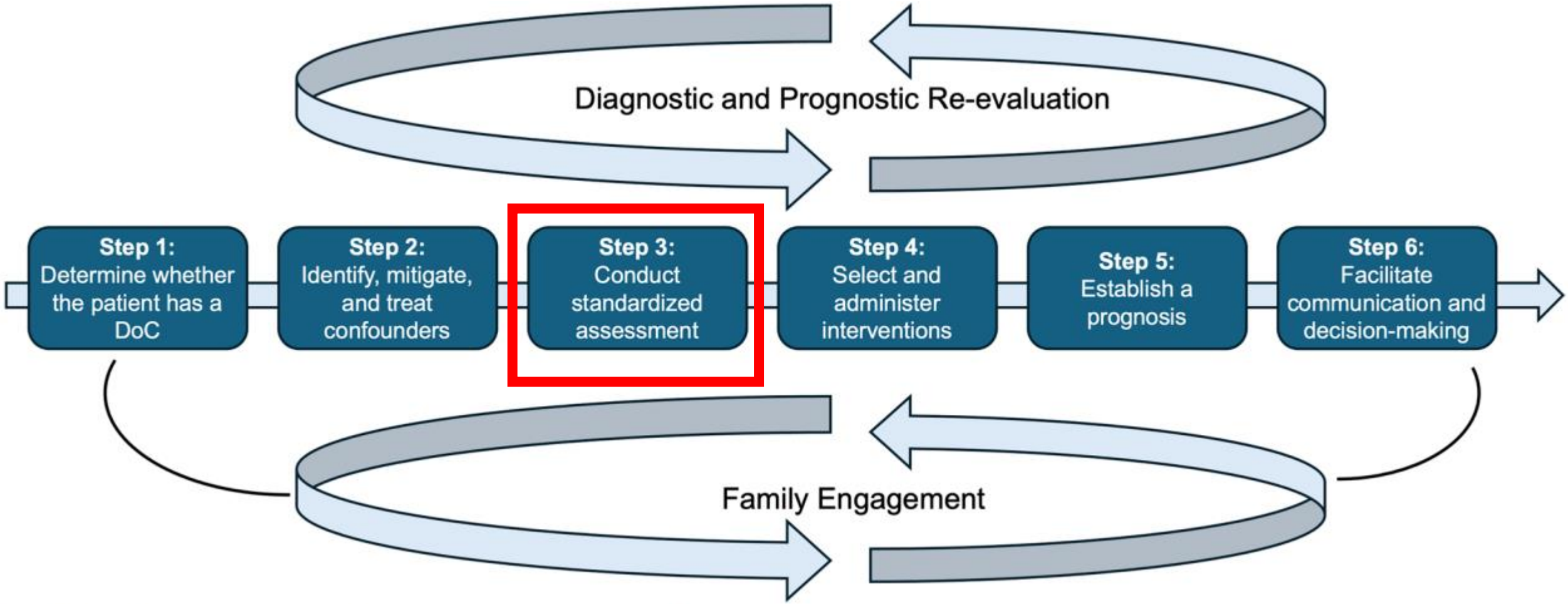


Fig. 1 A roadmap for acute disorders of consciousness (DoC) clinical care

3. Conduct Standardized Assessments

❖ **Behavioral Assessment in DoC Diagnosis**

- **Current Practice**:
  - **GCS**: Widely used, but lacks sensitivity for subtle awareness
  - **FOUR Score**: More comprehensive, similar limitations
- **Gold Standard**:
  - **CRS-R**: Detects subtle signs, reduces misdiagnosis
    - Assesses 6 domains: auditory, visual, motor, verbal, communication, arousal
    - Recommended by major professional bodies
- **Challenges**:
  - CRS-R takes 25–35 min → impractical for unstable ICU patients
- **Solutions**:
  - Rapid tools: CRSR-FAST, SECONDs (<10 min)
  - Serial assessments essential due to fluctuations
- **Best Practices**:
  - Quiet environment, minimize distractions
  - Wean sedation if possible
  - Use sensory aids, apply arousal protocols
- **Why It Matters**:
  - Accurate diagnosis informs prognosis & life-sustaining treatment decisions
  - WLST often occurs within 72 hours (~30-80%)

3. Conduct Standardized Assessments

Table 2 Comparative characteristics of behavioural scales for disorders of consciousness

Feature/Domain	GCS	FOUR Score	SECONDs	CRSR-FAST
Total score range	3–15	0–16	0–8	Binary (consciousness present vs absent)
Eye/visual responses	Spontaneous; to speech; to pain; none	Open/track or blink to command; open but no tracking; to voice; to pain; none	Eye-opening, visual pursuit, fixation	Visual pursuit and fixation
Motor responses	Obeys commands; localises pain; withdraws from pain; abnormal flexion; extension; none	Follows commands; localises pain; flexion; none	Command-following; pain localisation; oriented behaviours	Follows commands; automatic motor responses; localisation to pain; functional object use
Verbal/communication	Oriented; confused; inappropriate words; incomprehensible sounds; none	Not assessed	Yes/no communication	Intelligible speech; Yes/no communication
Brainstem reflexes	Not assessed	Pupil, corneal, cough reflexes	Not assessed	Not assessed
Respiration	Not assessed	Regular; Cheyne-Stokes; Irregular; Above ventilator; Apnoea/ventilator	Not assessed	Not assessed
Sensitive to transitions between DoC states	No	No	Yes	Yes
Administration and scoring manual available	No	No	Yes	Yes
Time required to administer	1–2 min	2–4 min	~7 min	~6 min
Clinical intent	TBI severity grading	Neurologic function, especially in intubated patients	DoC diagnostic classification; research; clinical follow-up	DoC diagnostic classification; research; clinical follow-up
Strengths	Widely validated; global use; simple	Assesses brainstem and respiration; works for intubated patients	Differentiates states of DoC	Differentiates states of DoC
Limitations	Insensitive to DoC transitions; poor for intubated patients	Less intuitive than GCS; limited DoC granularity	Requires prognostic validation; needs translation	Requires prognostic validation; needs translation

Comparison of four bedside tools for assessing the level of consciousness in the ICU: the Glasgow Coma Scale (GCS), Full Outline of UnResponsiveness (FOUR) Score, Simplified Evaluation of CONsciousness Disorders (SECONDs), and the Coma Recovery Scale-Revised For Accelerated Standardized Testing (CRSR-FAST). The table summarises their scoring range, domains assessed, diagnostic sensitivity, administration time, training requirements, clinical applications, strengths, and limitations

Glasgow Coma Scale

Component	Adult GCS	Score	Pediatric GCS (0–2 yrs)	Score
Eye Opening (E)	Spontaneous	4	Spontaneous	4
	To verbal command	3	To verbal command	3
	To pain	2	To pain	2
	No response	1	No response	1
Verbal Response (V)	Oriented & converses	5	Coos & babbles	5
	Disoriented & converses	4	Irritable cries	4
	Inappropriate words	3	Cries to pain	3
	Incomprehensible sounds	2	Moans to pain	2
	No response	1	No response	1
Motor Response (M)	Obeys commands	6	Moves spontaneously & purposefully	6
	Localizes pain	5	Withdraws to touch	5
	Withdraws from pain	4	Withdraws to pain	4
	Flexion to pain (decorticate)	3	Flexion to pain (decorticate)	3
	Extension to pain (decerebrate)	2	Extension to pain (decerebrate)	2
	No response	1	No response	1

Total Score Range: 3–15 (sum of E + V + M) Higher score = better neurological function)

FOUR Score

Component	4	3	2	1	0
Eye Response	Eyelids open or blink to command	Eyelids open but not tracking	Eyelids closed but open to loud voice	Eyelids closed but open to pain	Eyelids remain closed with pain
Motor Response	Thumbs-up, fist, or peace sign	Localizes pain	Flexion to pain	Extension to pain	No response or generalized myoclonus
Brainstem Reflexes	Pupil & corneal reflexes present	One pupil wide and fixed	pupil or corneal reflexes absent	pupil & corneal reflexes absent	Absent pupil, corneal, and cough reflex
Respiration	Not intubated, regular breathing	Not intubated, Cheyne-Stokes	Not intubated, irregular breathing	Breathes above ventilator rate	Breathes at ventilator rate or apnea

Total Score Range: 0–16(Higher score = better neurological function)

Coma Recovery Scale Revised (CRSR)

Subscale	Score Range	Key Items
Auditory Function	0–4	0 = None 1 = Auditory Startle 2 = Sound Localization 3 = Reproducible command-following 4 = Functional use
Visual Function	0–5	0 = None 1 = Visual Startle 2 = Fixation 3 = Visual pursuit 4 = Object localization/reaching 5 = Object recognition
Motor Function	0–6	0 = None 1 = Posturing 2 = Flexion withdrawal 3 = Localization to noxious 4 = Object manipulation 5 = Automatic motor 6 = Functional object use
Oromotor/Verbal	0–3	0 = None 1 = Oral reflexive 2 = Vocalization 3 = Intelligible verbalization
Communication	0–2	0 = None 1 = Non-functional 2 = Functional (accurate yes/no)
Arousal	0–3	0 = Unarousable 1 = Eye opening 2 = Eye opening with stimulation 3 = Attention

Total Score Range: 0–23 (Higher scores indicate greater behavioral responsiveness and consciousness)

CRSR-FAST

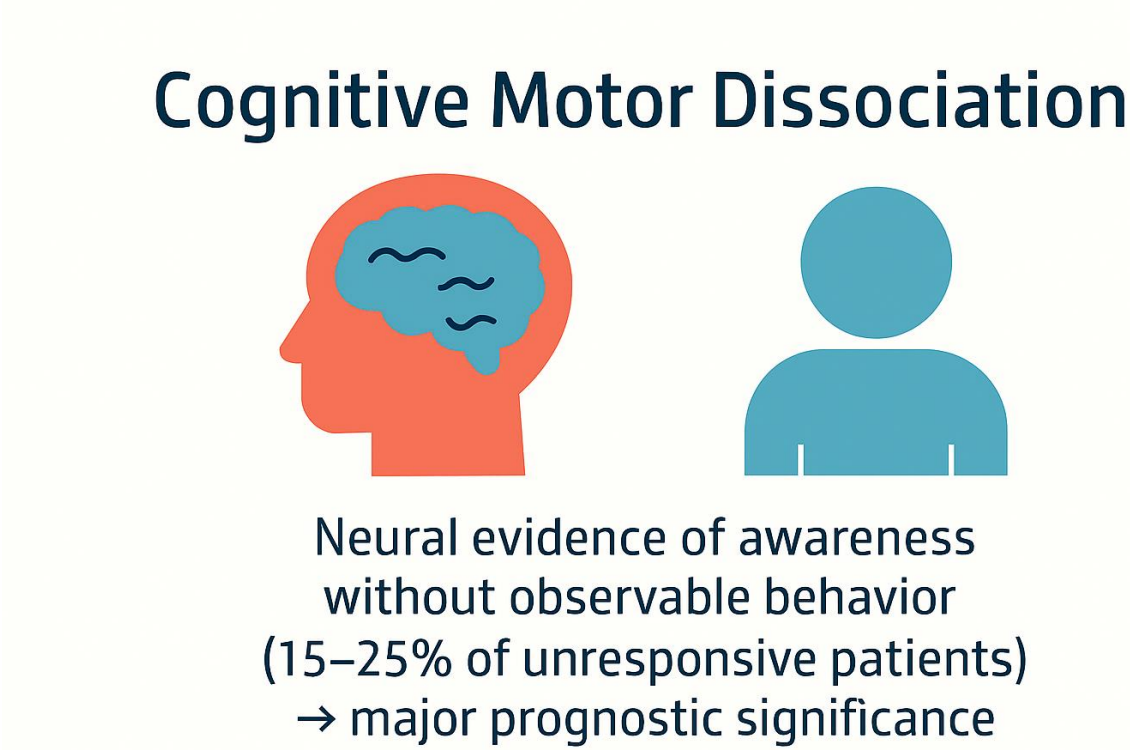
Subscale	Behavioral Indicator	CRSR threshold for Positive Response
1. Auditory	Patient performs a direct command (e.g., "open your eyes," "move your hand")	Auditory ≥ 3 (Consistent movement to command)
2. Visual	Maintains gaze on an object or face for ≥ 2 seconds	Visual = 2 (Fixation)
3. Motor	Non-reflexive, goal-directed movement toward an object or task	Motor ≥ 3
4. Oromotor/Verbal	Significant vocalization or attempted articulation	Oromotor/Verbal ≥ 2
5. Communication	Non-functional but intentional communication signals with recognizable pattern	Communication = 1
6. Arousal	Sustained eye opening sufficient to perform the assessment	Arousal = 1

CRSR-FAST reduces administration time from approximately 20 minutes to 6.5

Cognitive Motor Dissociation (CMD)

❖ **Cognitive Motor Dissociation (CMD)**

- **What is CMD?**
  - Covert brain responses to verbal commands detected by advanced tools such as **fMRI/task-based EEG**
  - Occurs in **15–25%** of patients who appear unresponsive (coma, UWS, MCS–)
- **Key Insights**:
  - CMD cannot be detected clinically
  - Some patients who follow commands behaviorally show no fMRI/EEG response → low sensitivity
- **Current Limitations**:
  - Detection confined to research settings
  - Requires specialized expertise
  - Not standardized or validated for routine clinical use
- **Why It Matters**:
  - CMD is relatively common in DoC → important for prognosis & care decisions

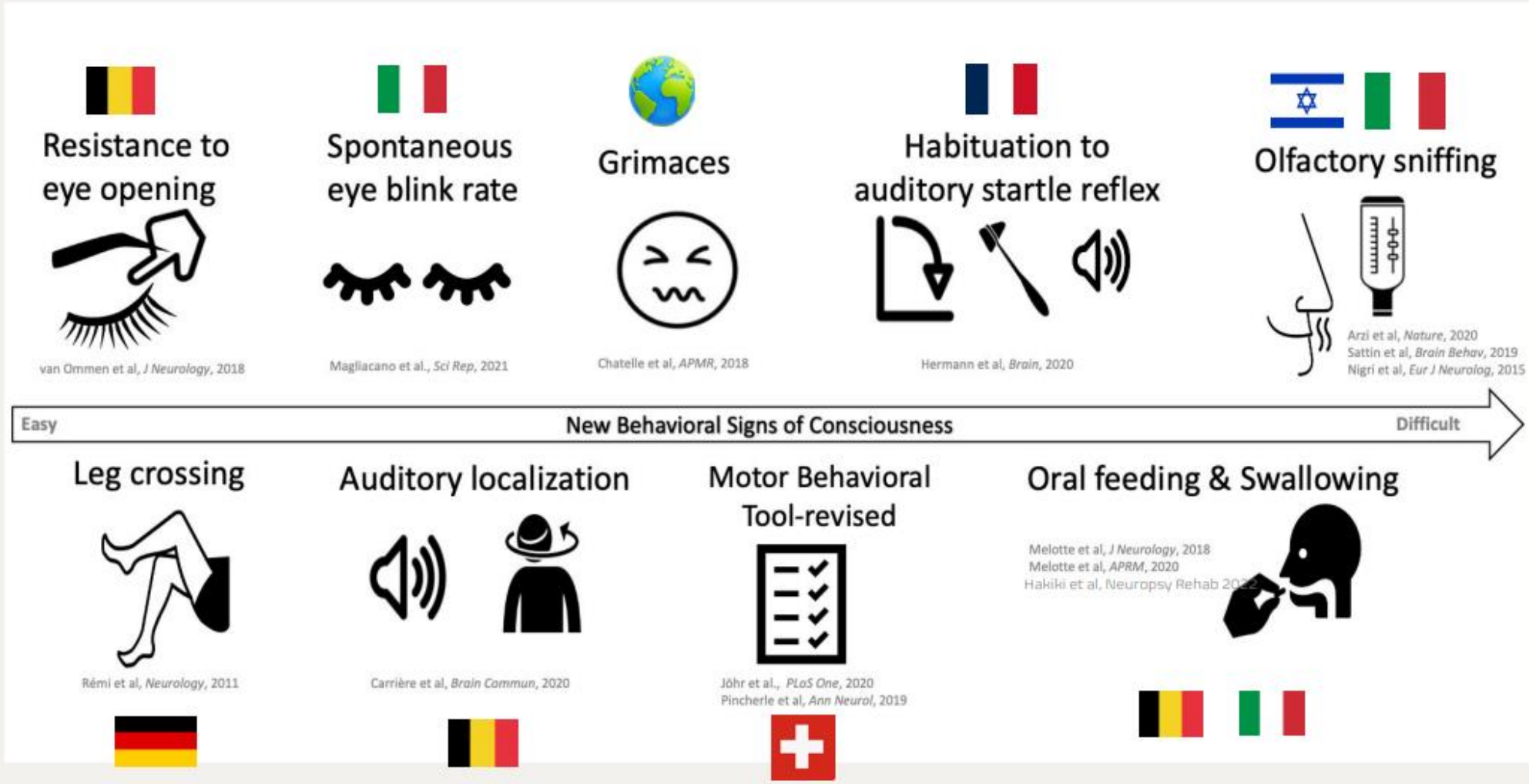


3. Conduct Standardized Assessments: Research Priorities

❖**Emerging Tools for Detecting Consciousness**

- **New Behavioral Indicators**
  - Resistance to eye-opening, auditory habituation, localization, blink rate, olfactory response, swallowing, leg crossing
- **Advanced Techniques**
  - **EEG**: Event-related potentials (P300), resting-state dynamics, AI-based multimodal analysis
  - **TMS-EEG**: Perturbational Complexity Index → high sensitivity for MCS
  - **Automated Pupillometry**: Non-invasive bedside tool
- **Key Insights**
  - No single technique = definitive diagnosis
  - Many methods show prognostic potential
- **Current Limitations**
  - Mostly research-only, limited access
  - Need validation & practical pipelines for clinical use

Additional Behavioral Signs of Consciousness



Mat, B. *et al.* New Behavioral Signs of Consciousness in Patients with Severe Brain Injuries. *Semin. Neurol.* **42**, 259–272 (2022).

Advanced Neuroimaging and Electrophysiological Modalities for CMD Detection

Modality	Mechanism	Key Advantages	Limitations
Task-based fMRI	BOLD signal changes during motor imagery tasks	Direct CMD detection; prognostic value	Requires cooperation; limited availability;
Task-based EEG	Machine learning classification of power spectral density changes during motor command tasks	Direct CMD detection; portable; bedside use; prognostic (OR 4.6 for better outcomes at 3-12 months)	Requires cooperation; limited availability
PET	Cortical glucose metabolism measured by fluorodeoxyglucose uptake (FDG-PET)	Prognostic across etiologies; no task required	Radiation exposure; limited availability; indirect marker;
TMS-EEG	Perturbational complexity index (PCI) quantifying cortical response complexity to TMS pulses	Possibly distinguishes MCS from VS/UWS; no task required	Specialized equipment needed; indirect marker; only mild discriminative ability
Resting-state fMRI	Functional connectivity and temporal stability of spontaneous BOLD signal fluctuations between brain networks	No task required; 91% accuracy in one study	Indirect marker; emerging evidence base, limited availability
Resting-state EEG	ABCD model (spectral density classification) and graph theory analysis of network connectivity	Widely available; no task required	Indirect marker; emerging evidence base

CMD = Cognitive Motor Dissociation; fMRI = functional Magnetic Resonance Imaging; BOLD = Blood-Oxygen-Level-Dependent; EEG = Electroencephalography; TMS = Transcranial Magnetic Stimulation; PET = Positron Emission Tomography; OR = Odds Ratio

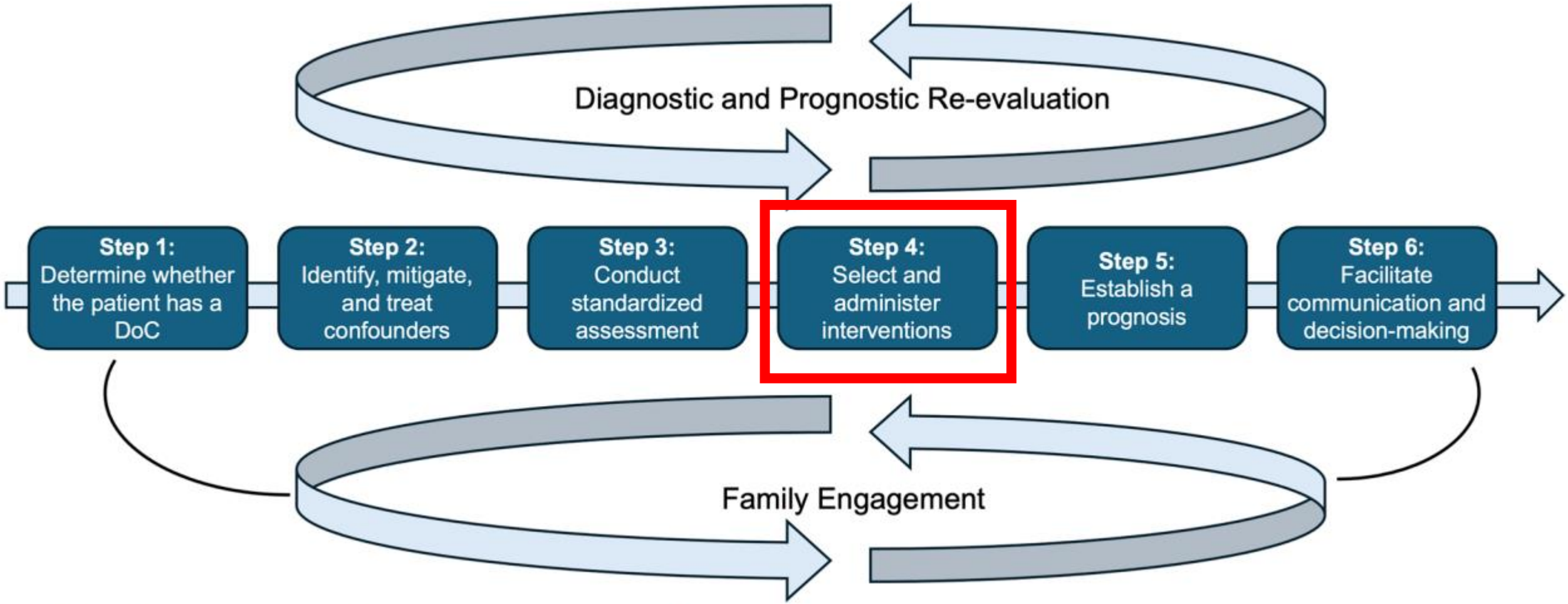


Fig. 1 A roadmap for acute disorders of consciousness (DoC) clinical care

4. Select and Administer Interventions

❖ **Treatment & Management of Acute DoC**

- **No proven intervention** to accelerate recovery in acute DoC
  - Pharmacologic & neuro-modulatory options → experimental only
- **Current Best Practice**:
  - Meticulous supportive care
  - Prevent secondary brain injury
  - Early rehabilitation
- **Comprehensive ICU Management**:
  - Maintain systemic homeostasis
  - Prevent complications: infections, VTE, ulcers, nutritional deficits
  - Address unique DoC needs: ICP, cerebral perfusion, metabolic demands
- **Key Priorities**:
  - Contracture prevention, safe mobilization
  - Manage tracheostomy/gastrostomy
  - Detect/treat paroxysmal sympathetic hyperactivity
- **Approach**: **Structured, multidisciplinary care** to optimize recovery & quality of life

4. Select and Administer Interventions

❖ **Pharmacologic & Rehabilitation Strategies**

- **Pharmacologic Treatments (Prolonged DoC)**
  - **Amantadine**: Accelerates recovery in TBI (1–4 months post-injury)
  - **Zolpidem**: Paradoxical responsiveness in 5–10% (transient, inconsistent)
  - Other agents under study: **apomorphine, methylphenidate, saxagliptin, psychedelics**
  - Responses **variable** → need phenotype-based targeting
- **Rehabilitation**
  - **Early, intensive rehab in ICU** → better outcomes, less ICU-acquired weakness
  - Multidisciplinary protocols: PT, OT, speech therapy
  - **Family involvement** improves outcomes
  - Access & standardization remain inconsistent
- **Future Research**
  - Define **optimal timing, intensity, modalities** for rehab
  - Validate pharmacologic strategies for clinical use

4. Select and Administer Interventions: Research Priorities

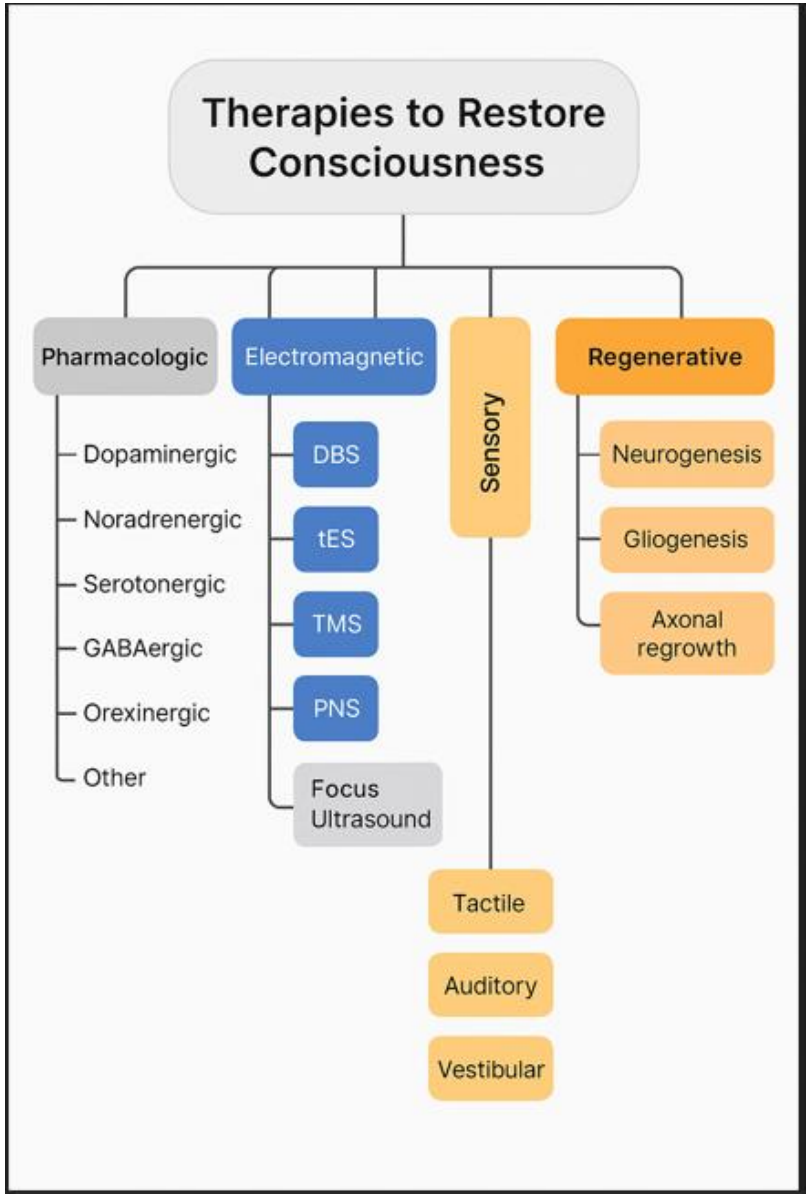
❖ **Neuromodulation & Neuroregeneration: Emerging Therapies**

- **Non-Invasive Neuromodulation**
  - Techniques: **rTMS**, **tDCS**, **tFUS**, **taVNS**, median nerve stimulation
  - **Potential**: Improve arousal & recovery in prolonged DoC
  - **Limitations**: Small samples, poor blinding, lack of sham controls → **low evidence**

- **Invasive Neuromodulation**
  - **Deep Brain Stimulation (DBS)**: Targets thalamic regions
  - **Promise**: Case reports show functional gains
  - **Challenges**: Invasive, risk of infection/bleeding, limited evidence

- **Neuroregeneration**
  - **Mesenchymal Stem Cells**: Promote neurogenesis & modulate inflammation
  - **Status**: Early-phase trials promising → need multicenter validation

Future Priority: Define **patient selection**, stimulation parameters, and validate protocols for clinical translation



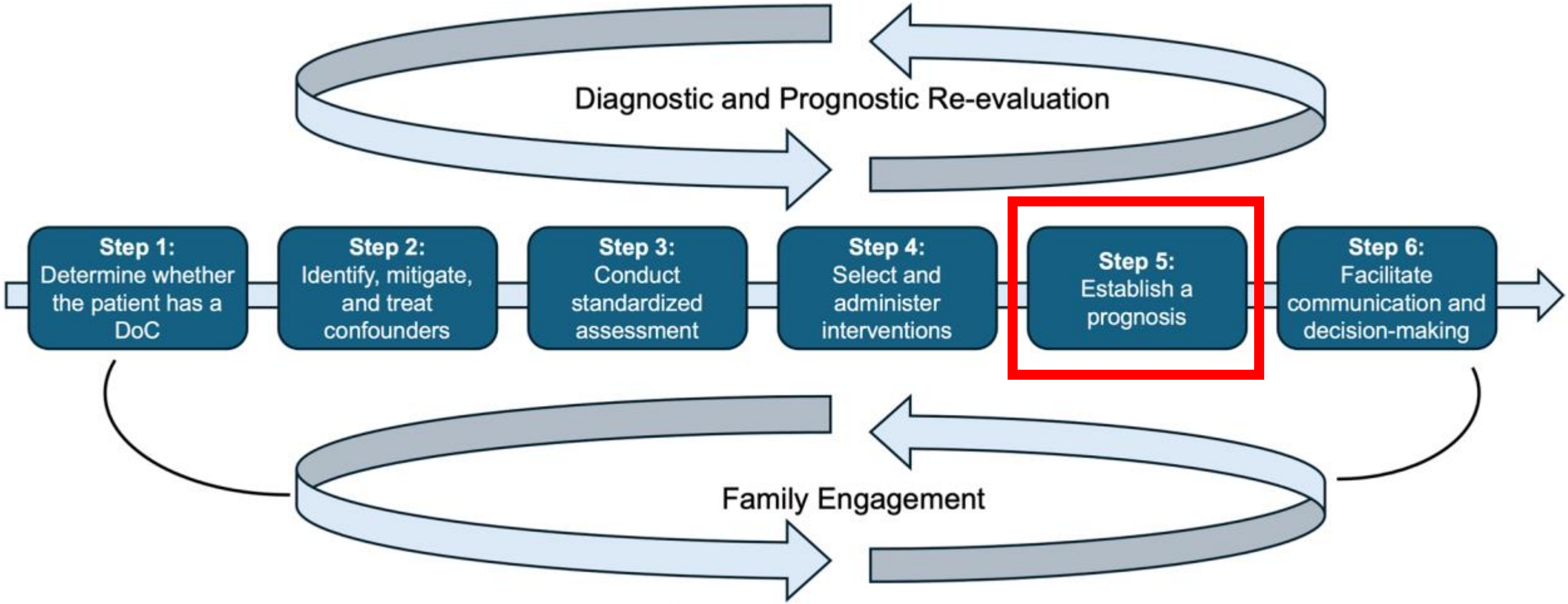


Fig. 1 A roadmap for acute disorders of consciousness (DoC) clinical care

5. Establish a Prognosis

❖ **Prognostication in Acute DoC: Challenges & Priorities**

- **High Uncertainty**
  - No optimal prognostic models
  - WLST decisions confound outcome data
- **Clinical Gaps**
  - Prognostic evaluations often delayed
  - No guidelines for timing or conditions of level-of-care discussions
- **Ethical Dilemmas**
  - Early WLST → risk of **self-fulfilling prophecy**
  - Delaying WLST → potential survival with poor quality of life
- **Key Considerations**
  - Communicate uncertainty transparently
  - Separate prognosis from level-of-care decisions
- **Future Directions**
  - Multimodal prognostic models
  - Long-term follow-up & systematic data integration
  - Research caution: WLST bias in outcome studies

5. Establish a Prognosis

❖**Prognostic Indicators & Models**

- **Current State**
  - Individual predictors (clinical, imaging, EEG, biomarkers) → insufficient accuracy
  - Best models exist for post-cardiac arrest DoC, but uncertainty persists
- **Recommendation**
  - Use multimodal approach combining clinical, neuroimaging, electrophysiology, and biomarkers
- **Limitations of Current TBI Models**
  - Designed for clinical trial risk adjustment, not bedside decisions
  - Rely on admission data only → ignore secondary injuries & treatment effects
- **Future Priority**
  - Develop dynamic, longitudinal prognostic models for real-world clinical use

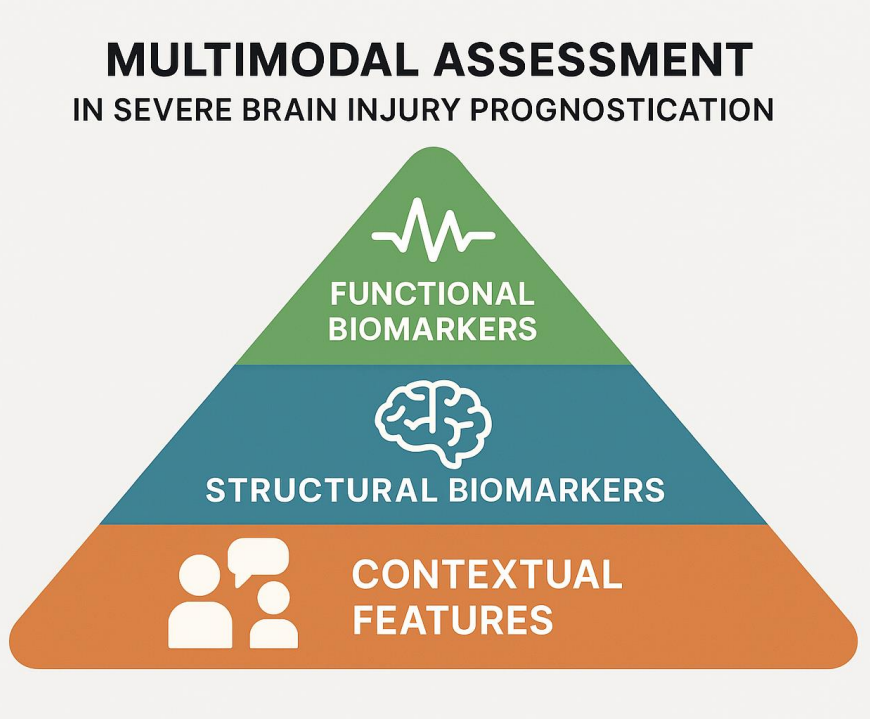
5. Establish a Prognosis

❖**Enhancing Prognostic Accuracy in DoC**

- **Foundations**
  - Standardized behavioral assessments = cornerstone for tracking recovery
  - Multimodal assessments → better accuracy
- **Advanced Predictors**
  - Neuroimaging & Electrophysiology
    - CMD detection, passive language responses
    - EEG: P300, Synek scores, ABCD model
    - TMS-EEG: Perturbational Complexity Index
    - fMRI resting-state connectivity
  - Limitations: Inconsistent findings, research-only, require expertise
- **Biomarkers**
  - Blood-based markers: NSE, GFAP, UCH-L1, NFL, S100B, tau
  - Improve prognostic accuracy vs GCS alone
  - Timing matters → values fluctuate
- **Outcome Measures**
  - Current scales (GOS, CPC, mRS) = broad, often dichotomized
  - Miss subtle improvements & patient priorities
  - Need patient-centered outcomes reflecting quality of life

5. Establish a Prognosis

- **Functional Biomarkers:**
  - Neurologic examination
  - EEG
  - Evoked potentials
  - Advanced neuroimaging
- **Structural Biomarkers**
  - CT
  - MRI
  - Quantitative CT/MRI
  - Diffusion MRI
  - Serological biomarkers
- **Contextual Features**
  - Age
  - Medical comorbidities
  - Premorbid function
  - Socioeconomic factors
- **Multidisciplinary Team Input involving:**
  - Neurocritical Care, Neurology, Neurosurgery, and Neurointerventional specialists and relevant medical specialties as appropriate
  - Rehabilitation services: Physical therapy, Occupational therapy, Speech therapy
  - Supportive care: Social work and care coordination



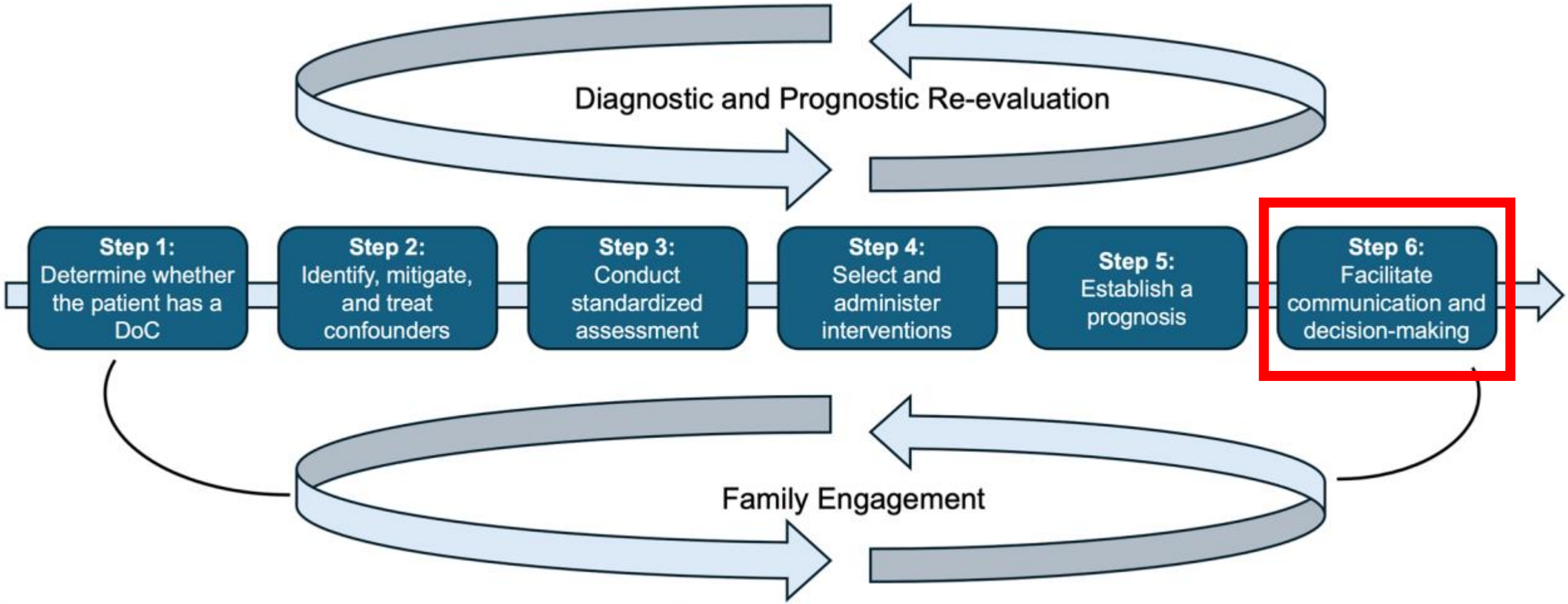


Fig. 1 A roadmap for acute disorders of consciousness (DoC) clinical care

6. Facilitate Communication and Decision Making

❖ **Family Communication & Shared Decision-Making**

- **Core Principles**
  - Deliver complex info clearly, compassionately, consistently
  - Promote goal-concordant care & reduce caregiver strain
- **Best Practices**
  - Structured family meetings
  - Use standardized protocols, decision aids, respect cultural/religious values
  - Consider time-limited trials of therapy
- **Shared Decision-Making**
  - Integrate evidence + patient values
  - Reassess preferences over time
  - Engage bioethics/palliative care for complex cases
- **Surrogate Decision-Making**
  - Substituted Judgment: What patient would want
  - Best Interests: When values unknown
- **Ethical Imperatives**
  - Avoid nihilism & ableism
  - Define “acceptable outcome” by patient/surrogate, not clinicians

6. Facilitate Communication and Decision Making

❖ **Family & Clinician Challenges in Acute DoC**

- **Family Distress**
  - High emotional burden from prognostic uncertainty
  - Inconsistent communication → mistrust
- **Clinician Stress**
  - Uncertainty → cognitive biases in prognosis & decisions
- **Post-ICU Transition Gaps**
  - Families often unprepared for long-term care
  - Limited access to rehab & specialized services
  - Families assume roles of caregivers & coordinators
- **Impact**
  - Low quality of life, high mental health strain
- **Solution**
  - View recovery as a **continuum of care**
  - Close collaboration: intensivists, rehab teams, nurses, families

6. Facilitate Communication and Decision Making

❖ **Ethical Challenges in DoC Care**

- **Key Issues**
  - Risk of **misdiagnosis** (conscious vs unconscious)
  - High **prognostic uncertainty** → impacts WLST decisions
  - Balancing **beneficence vs non-maleficence**

- **Research Priorities**
  - Develop **effective communication strategies**
  - Create **decision aids** for evidence-informed choices
  - Support interventions for **family emotional burden**
  - Improve quality of **surrogate decision-making**
  - Define **person-centered outcomes** beyond survival

- **Goal**: Promote **ethical, transparent, patient-centered care**

Framework for Neuroprognostication in DOC

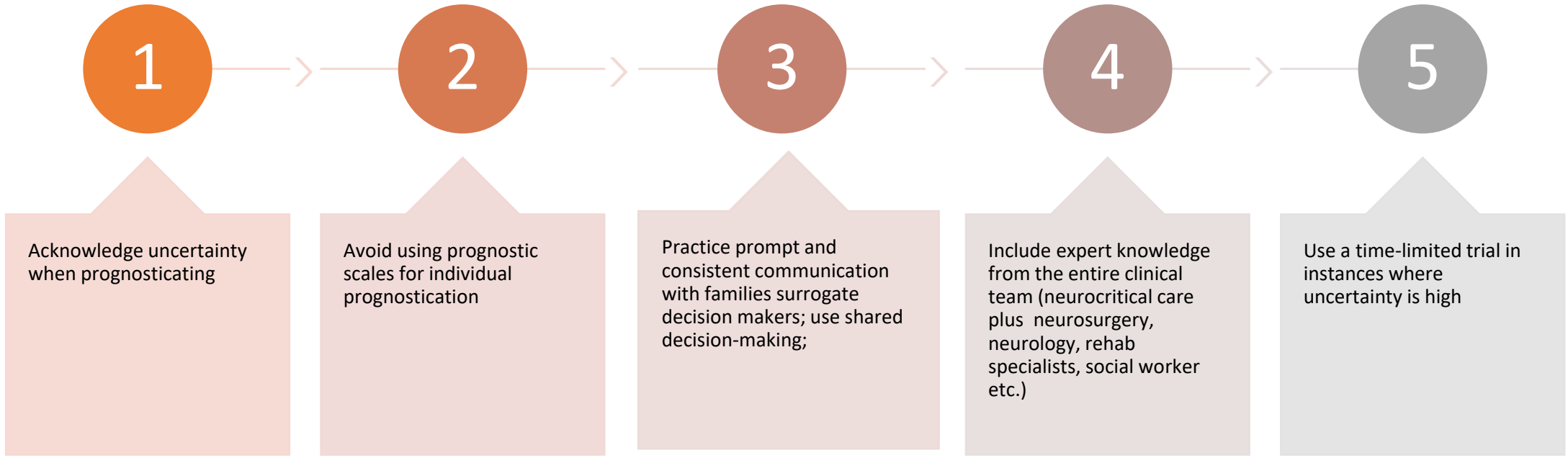


Table 3 Synthesis of current knowledge, immediate actions, and remaining gaps in the diagnosis, intervention, and prognosis of patients with disorders of consciousness

What is known	What can be done now	Gaps
Diagnosis		
-Routine bedside exams (e.g., GCS or FOUR scores) are insufficient to detect subtle signs of consciousness -Standardised behavioural assessments increase diagnostic and prognostic precision -Advanced technologies (e.g., task-based fMRI/EEG) can detect cognitive motor dissociation (CMD)	-Identify and avoid confounders (e.g., sedation, infection, seizure) that may mask consciousness -Identify reversible causes of DoC (via imaging, electrophysiology, laboratory tests, etc.) -Maximise arousal prior to behavioural assessment -Use standardised behavioural assessments (e.g., CRSR-FAST, SECONDs) to assess consciousness -Repeat assessments during the ICU admission to track recovery trajectory	-No well-defined endotypes exist for DoC -The term "coma" is used imprecisely to describe the full spectrum of DoC -Current behavioural assessment approaches lack standardisation -Subtle signs of consciousness may be missed without comprehensive evaluations -Advanced diagnostic tools require more validation -Access to these advanced tools is limited -The absence of systematic, precise surveillance of acute DoC admissions and outcomes limits the understanding of epidemiology
Intervention		
-No treatment has been proven to enhance recovery from acute DoC -Existing ICU guidelines are largely consensus-based and have limited evidence for use in DoC -Multiple pharmacological and neuro-modulatory interventions are under development	-Optimise overall ICU medical management and prevent complications -Initiate early rehabilitation, including family involvement, when there are no contraindications	-Evidence for ICU interventions targeting DoC is limited -Lack of patient stratification approaches to optimise clinical trial responsiveness -Intervention targets remain imprecise -Limited access to experimental interventions
Prognosis		
-Outcomes range from death and prolonged DoC to full recovery -WLST may affect study outcomes and interpretations if not well-informed or if mainly based on criteria unrelated to the neurological prognosis in accordance with patient wishes -Self-fulfilling prophecies in prognostication are a concern -Existing prediction models lack the accuracy to inform clinical decision-making at an individual patient level	-Employ a cautious, multifaceted approach to prognostication -Utilise multiple sources of information to improve prognostic accuracy -Communicate the range of outcomes and degree of uncertainty -Engage in shared decision-making and provide consistent information on the current situation and post-acute journey -Regularly reevaluate prognosis during and after the ICU course -Document level-of-care discussions	-Prognostic precision for individual acute DoC patients is limited -WLST rates and decision-making processes are underreported -Absence of decision-aids to help surrogate decision-makers with level-of-care decisions -Existing outcome assessment tools are not person-centred and may not measure outcomes that are meaningful to individuals with lived experience

Conclusions

❖**2025 ISICEM Roadmap**:

- Recognize DoC after brain injury
- Identify & treat confounders masking consciousness
- Standardized, serial behavioral assessments
- Prevent secondary injury & start early rehab
- Multimodal prognostication acknowledging uncertainty
- Structured family communication & shared decisions

- **Core Principles**:
  - Multimodal assessments
  - Clear, consistent communication
  - Multidisciplinary collaboration
  - Global research networks

- **Goal**: Improve survival & quality of life

THANK YOU!

https://pubmed.ncbi.nlm.nih.gov/41396553/