IFIMP | April 2026 | **INTENSIVMEDIZIN im GRENZBEREICH** | «*Ain't No Mountain High Enough*»

Mittwoch | 15.04.2026 | **Neues von HIRN und Lunge**

Disorders of Consciousness –

Neue Aspekte zu Bewusst*heit* nach schwerer Hirnschädigung

Assoz. Prof. PD Dr. Ronny Beer

Neurologische Intensivstation | Univ.-Klinik für Neurologie
Medizinische Universität Innsbruck
6020 Innsbruck | Anichstraße 35
E-Mail: ronny.beer@i-med.ac.at

«*In eigener Sache …*» – Offenlegung von potentiellen Interessenskonflikten

Ich, **Ronny Beer**, gebe folgende ***potentielle* Interessenskonflikte** bekannt

- **Indirekte** finanzielle Zuwendungen (*laufend*, in den *letzten 5 Jahren*)
  - Auftragsforschung für ***Alexion*** *AstraZeneca Rare Disease* (ehem. Portola Pharmaceuticals), ***Fresenius Kabi***, ***Hamilton Health Sciences Corporation***, ***Vasopharm***
  - Drittmittelforschung gefördert von ***FWF Der Wissenschaftsfonds***
- **Direkte** finanzielle Zuwendungen (in den *letzten 5 Jahren*)
  - ***Alexion*** *AstraZeneca Rare Disease*, ehem. Portola Pharmaceuticals (Advisory Boards, Vortragshonorare), ***Astro Pharma*** (Vortragshonorar), ***Bayer*** (Kongressunterstützung), ***Boehringer Ingelheim*** (Advisory Boards, Kongressunterstützung, Vortragshonorare), ***Fresenius Kabi*** (Kongressunterstützung, Vortragshonorare), ***GE Healthcare*** (Kongressunterstützung, Vortragshonorar), ***Gilead*** (Advisory Board), ***Gesundheit Österreich GmbH*** (**Lokaler Transplantationsbeauftragter**), ***Pfizer*** (Kongressunterstützung), ***Nestlé Health Science*** (Kongressunterstützung), ***Sanitas*** (Vortragshonorare), ***Ski Austria*** (Advisory Boards, Vortragshonorare), ***ZOLL Medical*** (Kongressunterstützung, Vortragshonorar)

«*In eigener Sache …*» – Offenlegung von potentiellen Interessenskonflikten

Die **Medizin** ist **ständigen Entwicklungen** unterworfen. Forschung und klinische Erfahrung erweitern unsere Erkenntnisse, insbesondere was Behandlung und medikamentöse Therapie anbelangt.

- Soweit im Folgenden **Dosierungen** oder **Applikationen** erwähnt werden, darf darauf vertraut werden, dass diese Angaben dem **aktuellen Wissensstand entsprechen**.
- Für Angaben über **Dosierungsanweisungen** kann vom Vortragenden jedoch ***keine Gewähr übernommen*** werden. ***Jede Dosierung oder Applikation erfolgt auf eigene Gefahr***. Auf ***sorgfältige Prüfung*** der entsprechenden ***Fachinformation*** wird ***explizit hingewiesen***.
- Geschützte Warennamen (Warenzeichen) werden nicht besonders kenntlich gemacht. Aus dem Fehlen eines solchen Hinweises kann nicht geschlossen werden, dass es sich um einen freien Warennamen handelt.

Ronny Beer, April 2026

Disorders of Consciousness (*DoC*) – Neue Aspekte zu Bewusst*heit* nach schwerer Hirnschädigung

Agenda

- Vorstellung der **Konzepte** von **Koma**, **UWS**, **MCS** (–/+) sowie CMD/ **Covert Awareness**

Neues von HIRN …

NARRATIVE REVIEW

Disorders of consciousness diagnosis, interventions, and prognostication for the intensivist: Report of the 2025 ISICEM roundtable

esicm The intensive connection

ISICEM we care intensively

[5]*Modifiziert nach Bodien et al.,* ***Intensive Care Med 2026****; 52: 42–62*

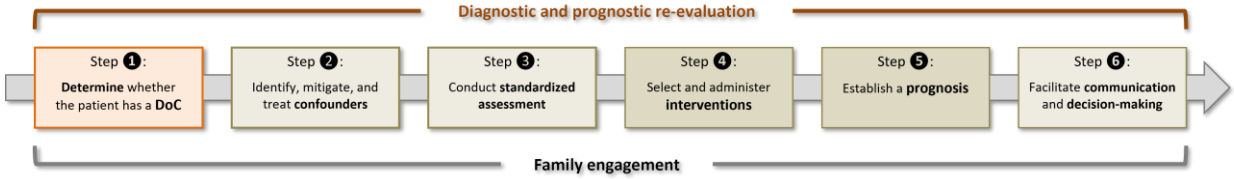
DoC – Dringliches Anliegen der (Neuro-) Intensivmedizin

NARRATIVE REVIEW

Disorders of consciousness diagnosis, interventions, and prognostication for the intensivist: Report of the 2025 ISICEM roundtable

Take-home message

- 18 expert clinicians and researchers to synthesize and discuss the **latest evidence** on acute **DoC epidemiology**, **diagnosis**, **treatment**, and **prognosis**
- Identification of a **six-step roadmap**
- Emerging **research** advances remain preliminary and **require replication**, **validation**, or **clinical translation**



*§Modifiziert nach Bodien et al., **Intensive Care Med 2026**; 52: 42–62*

DoC – (Beste) wissenschaftliche Evidenz

DoC – (Beste) wissenschaftliche Evidenz

Bewusstsein und Bewusstheit – Das «gallische Dorf» der (Neuro-) Wissenschaft(en)

[5]Quelle: https://science.orf.at/stories/3233638/; https://tirol.orf.at/stories/3299890/; https://science.orf.at/stories/3231634/

Bewusstsein und Bewusstheit – Das «gallische Dorf» der (Neuro-) Wissenschaft(en)

QUANTENTHEORIE

Auf den Spuren des Bewusstseins

Was Bewusstsein genau ist und wie es entsteht, sind nach wie vor offene Fragen der Wissenschaft. Der Physiker Thomas Görnitz versucht, mit Hilfe der Quantentheorie Antworten zu finden. Er geht dabei von einer Art Ur-Quantenbits aus, die dem Universum zugrunde liegen und zu subjektiven Bewusstseinsinhalten führen können.

- **Bewusstsein** ist die **Fähigkeit**,
  - Die **eigenen Gedanken zu wissen**
  - **Sich selbst *und*** die **Umwelt** in einer gewissen Weise **zu verstehen**

- **Bewusstsein** …, dass man sich **erinnern kann** und … bestimmte **Möglichkeiten erwägt**, die … das **eigene Handeln beeinflussen**
- Art der **Informationsverarbeitung** …, was das Lebendige vom Unbelebten unterscheidet

Quantum information as the scientific basis for the explanation of human consciousness and its evolution

- **Abstract**, i.e. still meaning-free, and absolute, i.e. cosmically based, **bits of quantum information**, **AQIs**, provide the **common basis** for **consciousness**, **energy** and **matter**
- Explains the **mutual influences** between **matter**, **energy** and the **information** that is **meaningful** for a **living being**

[5]Modifiziert nach Görnitz, BioSystems 2025; 252: 105467

Bewusstsein und Bewusstheit – Theoretische Grundlagen

Theories of consciousness

Theory	Primary claim
Higher-order theory (HOT)	Consciousness depends on meta-representations of lower-order mental states
Global workspace theories (GWTs)	Consciousness depends on ignition and broadcast within a neuronal global workspace where fronto-parietal cortical regions play a central, hub-like role
Integrated information theory (IIT)	Consciousness is identical to the cause–effect structure of a physical substrate that specifies a maximum of irreducible integrated information
Predictive processing	Perception depends on predictive inference of the causes of sensory signals; provides a framework for systematically mapping neural mechanisms to aspects of consciousness

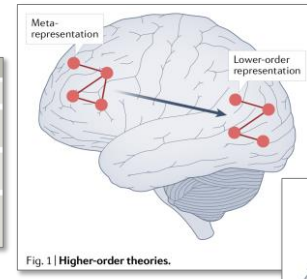


Fig. 1 | **Higher-order theories.**

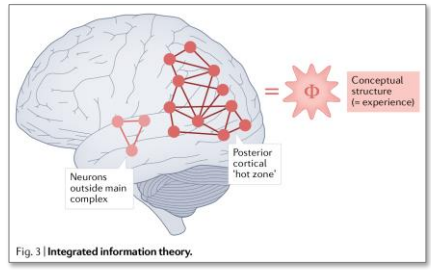


Fig. 3 | **Integrated information theory.**

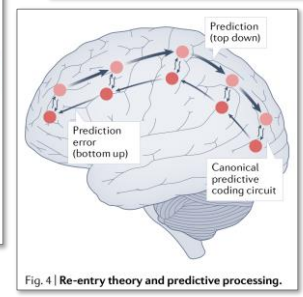


Fig. 4 | **Re-entry theory and predictive processing.**

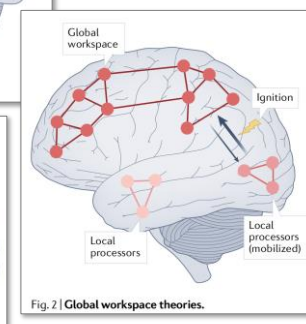


Fig. 2 | **Global workspace theories.**

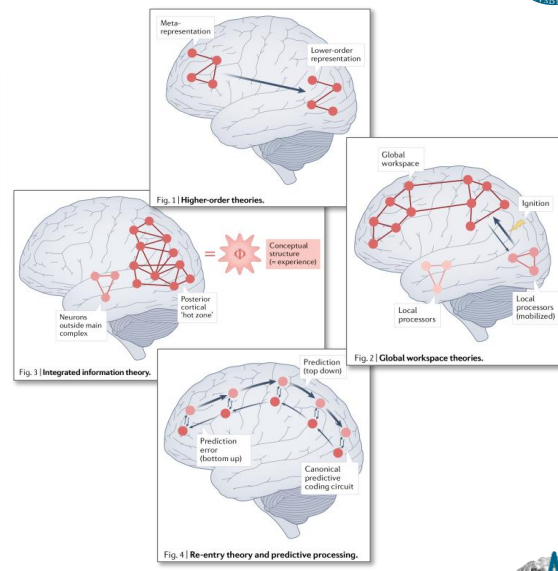
[5]Modifiziert nach Seth und Bayne, Nat Rev Neurosci 2022; 23: 439–452

Bewusstsein und Bewusstheit – Theoretische Grundlagen

Theories of consciousness

Theory	Primary claim
Higher-order theory (HOT)	Consciousness depends on meta-representations of lower-order mental states
Global workspace theories (GWTs)	Consciousness depends on ignition and broadcast within a neuronal global workspace where fronto-parietal cortical regions play a central, hub-like role
Integrated information theory (IIT)	Consciousness is identical to the cause–effect structure of a physical substrate that specifies a maximum of irreducible integrated information
Predictive processing	Perception depends on predictive inference of the causes of sensory signals; provides a framework for systematically mapping neural mechanisms to aspects of consciousness

- The «***hard***» and «***easy***» **problems** of **consciousness**
  - The ***hard*** problem concerns the **experiential** (phenomenal, subjective) **dimensions** of consciousness
  - The ***easy*** problems are concerned with the **functions** and **behaviors** associated with consciousness



[5]*Modifiziert nach Seth und Bayne, Nat Rev Neurosci 2022; 23: 439–452*

Bewusstsein und Bewusstheit – «*Its … mission: … To boldly go where no one has gone before*»

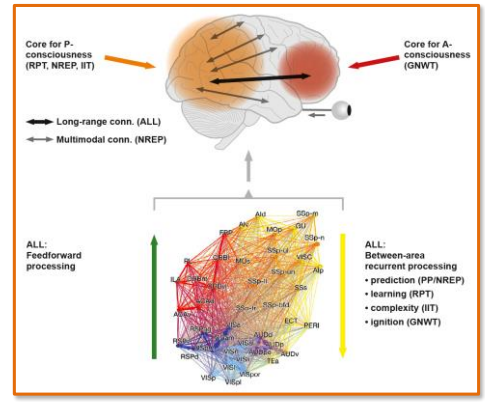
Perspective

An integrative, multiscale view on neural theories of consciousness

- The «***hard***» and «***easy***» **problems** of **consciousness**
  - The ***hard*** problem concerns the **experiential** (phenomenal, subjective) **dimensions** of consciousness
  - The ***easy*** problems are concerned with the **functions** and **behaviors** associated with consciousness

Table 1. Terms and concepts

Term	Definition or explanation
Phenomenal consciousness (PC)	PC refers to those properties of experience that correspond to "what it is like" for a subject to have those experiences. "These features are apparent to the subject from the inside, so tracking them arguably depends on one's having the relevant experience."
Access consciousness (AC)	AC refers to those properties of experience that are accessible for use in reasoning, report, and the control of action (i.e., in voluntary ("rational") control of behavior).



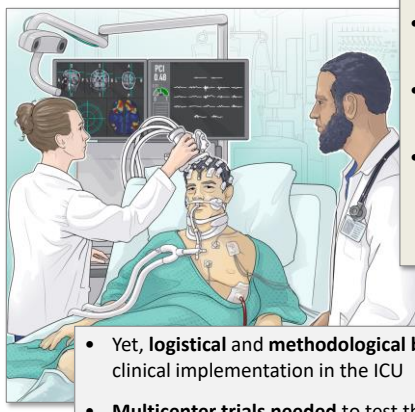
- **Mind-brain problem**
  - How is **conscious experience** related to **material brain processes**
  - One of the deepest **unsolved problems** in science

[5]*Modifiziert nach Storm et al., Neuron 2024; 112: 1531–1552*

Bewusstsein und Bewusstheit – Neurowissenschaft «trifft» Neurointensivmedizin

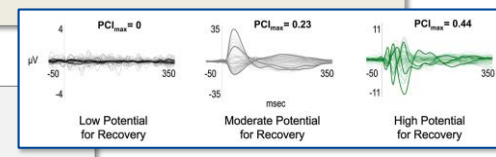
VIEWPOINT

Measuring Consciousness in the Intensive Care Unit



***TMS*-EEG**

- **Potential** to ***detect*** **consciousness** in the ICU, ***predict*** **recovery**, and ***prevent*** **premature WLST**
- **Performance characteristics** that **surpass** those of **other** ***advanced*** «***consciousness-detectors***»
- **Potential** to provide clinicians and families with a **reliable index of consciousness**
  - ***PCI*** could substantially impact decisions about the continuation of LST



- Yet, **logistical** and **methodological barriers** currently prevent clinical implementation in the ICU
- **Multicenter trials needed** to test the **reliability** of ***TMS*-EEG** measures of ***PCI*** in critically ill patients with DBI

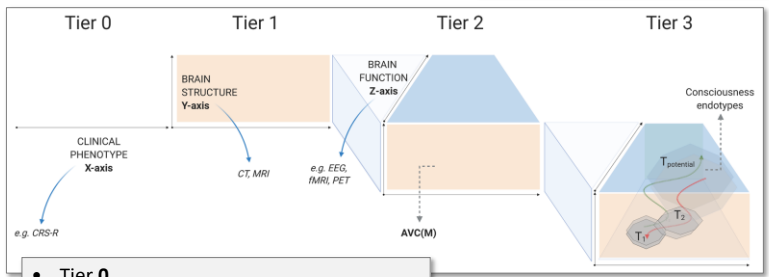
[5]*Modifiziert nach Edlow et al., Neurocrit Care 2023; 38: 584–590*

DoC – «*Brave New World*» (frei nach *A. Huxley*, 1932)

THE CURING COMA CAMPAIGN

A Precision Medicine Framework for Classifying Patients with Disorders of Consciousness: Advanced Classification of Consciousness Endotypes (ACCESS)

- Tier **2**
  - Adds **functional measures** including EEG, PET and fMRI



- **Arousal**
  - Wakefulness/eye-opening, mediated by the brainstem
- **Tier 3**
  - **Dynamic changes** over time with a (theoretically infinite) number of physiologically distinct states to outline **consciousness recovery**
- **Mechanisms**
  - Underlying functional/physiological state confirming whether neural networks for awareness are intact

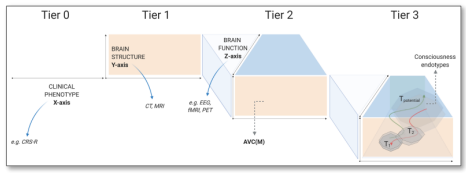
- Tier **0**
  - (Traditional) **semiological evaluation** at the **bedside**
- Tier **1**
  - Based on **clinical phenotypes** and **structural imaging**

[5]*Modifiziert nach Kondziella et al., Neurocrit Care 2021; 35: 27–36*

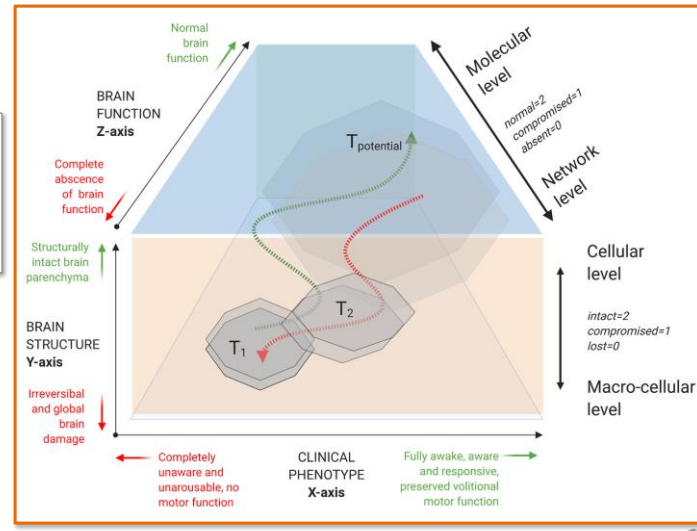
DoC – «*Brave New World*» (frei nach *A. Huxley*, 1932)

THE CURING COMA CAMPAIGN

A Precision Medicine Framework for Classifying Patients with Disorders of Consciousness: Advanced Classification of Consciousness Endotypes (ACCESS)



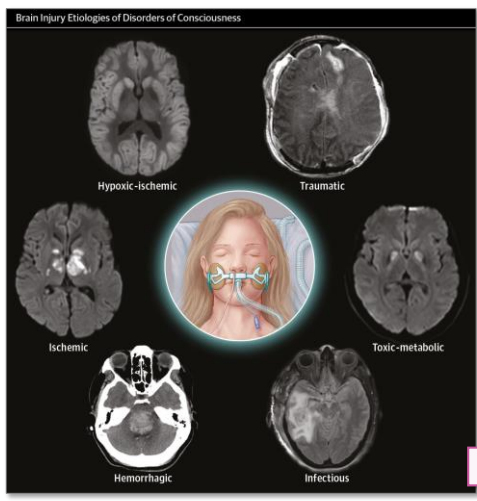
- **Tier 3**
  - **Dynamic changes** over time with a (theoretically infinite) number of physiologically distinct states to outline **consciousness recovery**



[5]*Modifiziert nach Kondziella et al., Neurocrit Care 2021; 35: 27–36*

DoC : Koma, UWS, CMD, MCS & Co.

Coma Prognostication After Acute Brain Injury
A Review



SPECIAL ARTICLE

Comprehensive systematic review update summary: Disorders of consciousness

Cumulative recovery of consciousness in disorders of consciousness (DoC) lasting ≥28 days

Type of DoC	3 months	6 months	12 months	24 months
Posttraumatic VS/UWS	38% (29%–47%)	67% (58%–76%)	78% (69%–86%)	
Nontraumatic VS/UWS		17% (5%–30%)[a]		7.5% (0%–24%)[b]

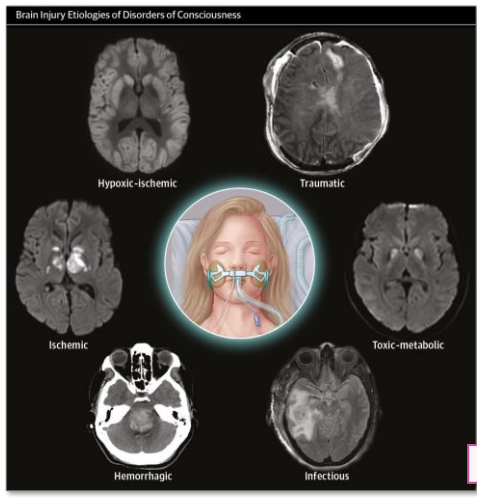
[a] This meta-analysis included studies of patients 6–8 months postinsult.
[b] These estimates are for patients still in a DoC at 6 months and reflects a meta-analysis of 2 studies[e3,e13] published 20 years apart (1993 and 2013), with high heterogeneity in the meta-analysis.

- **Emergence from MCS (eMCS)**
- **Minimally conscious state (MCS) *plus***
- **Minimally conscious state (MCS) *minus***
- **Unresponsive wakefulness syndrome (UWS)**
- **Coma**

[5]*Modifiziert nach Giacino et al., Neurology 2018; 91: 461–470*

DoC : Koma, UWS, CMD, MCS & Co.

Coma Prognostication After Acute Brain Injury
A Review



SPECIAL ARTICLE

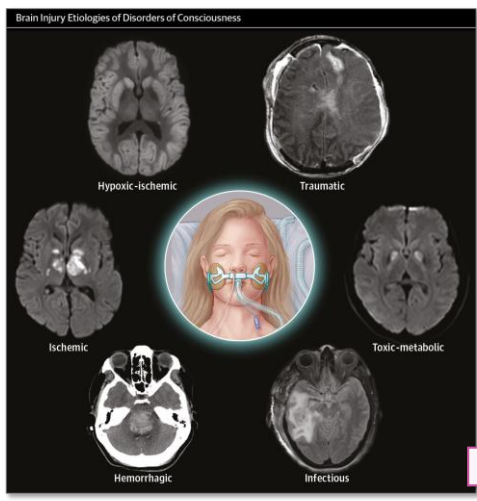
Comprehensive systematic review update summary: Disorders of consciousness

- ***Mild*** **cognitive disability/compete *recovery***
- **Emergence from MCS (eMCS)**
  - ***Moderate*** **cognitive disability**
- **Emergence from MCS (eMCS)**
  - ***Severe*** **cognitive disability**
- **Minimally conscious state (MCS) *plus***
- **Minimally conscious state (MCS) *minus***
- **Unresponsive wakefulness syndrome (UWS)**
- **Coma**

[§]Modifiziert nach Fischer und Edlow, JAMA Neurol 2024; 81: 405–415

DoC : Koma, UWS, CMD, MCS & Co.

Coma Prognostication After Acute Brain Injury
A Review



SPECIAL ARTICLE

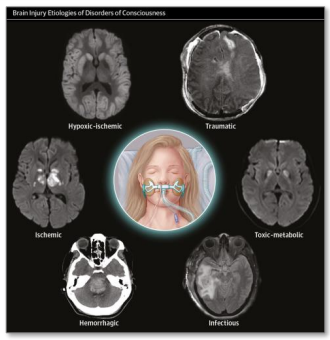
Comprehensive systematic review update summary: Disorders of consciousness

- ***Mild*** **cognitive disability/compete *recovery***
- **Emergence from MCS (eMCS)**
  - ***Moderate*** **cognitive disability**
- **Emergence from MCS (eMCS)**
  - ***Severe*** **cognitive disability**
- **Minimally conscious state (MCS) *plus***
- ***Cognitive Motor Dissociation* (*CMD*)**
- **Minimally conscious state (MCS) *minus***
- *Covert cortical processing* (CCP)
- **Unresponsive wakefulness syndrome (UWS)**
- **Coma**

[§]Modifiziert nach Fischer und Edlow, JAMA Neurol 2024; 81: 405–415

DoC – Diagnostische Überlegungen im Kontext der neurologischen Prognosestellung

Coma Prognostication After Acute Brain Injury
A Review



PERSPECTIVES

Neuroprognostication: a conceptual framework

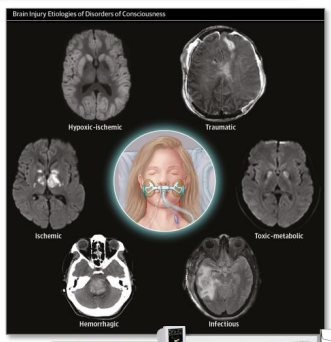
Examples of ***neuroprognostic*** **factors**

Structural biomarkers	**Functional biomarkers**	
• CT	• *Neurological examination*	• EEG
• Structural MRI	• SSEPs	• Event-related potentials
• Tractography	• Functional MRI	• SPECT
• Body fluid biomarkers	• PET	• Transcranial magnetic stimulation-EEG

[5]*Modifiziert nach Fischer et al., Nat Rev Neurol 2022; 18: 419–427*

DoC – Diagnostische Überlegungen im Kontext der neurologischen Prognosestellung

Coma Prognostication After Acute Brain Injury
A Review



PERSPECTIVES

Neuroprognostication: a conceptual framework

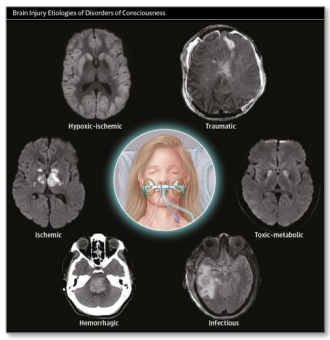
Examples of ***neuroprognostic*** **factors**

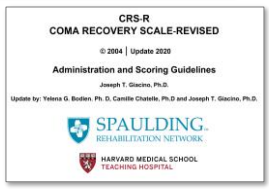
Structural biomarkers	**Functional biomarkers**	
• CT	• *Neurological examination*	• EEG
• Structural MRI	• SSEPs	• Event-related potentials
• Tractography	• Functional MRI	• SPECT
• Body fluid biomarkers	• PET	• Transcranial magnetic stimulation-EEG
Contextual factors		
• Age	• Premorbid level of function	• Medical and neurological co-morbidities
• Cause of brain injury	• Social supports	

[5]*Modifiziert nach Fischer et al., Nat Rev Neurol 2022; 18: 419–427*

DoC – Diagnostische Überlegungen im Kontext der Leitlinien

Coma Prognostication After Acute Brain Injury
A Review

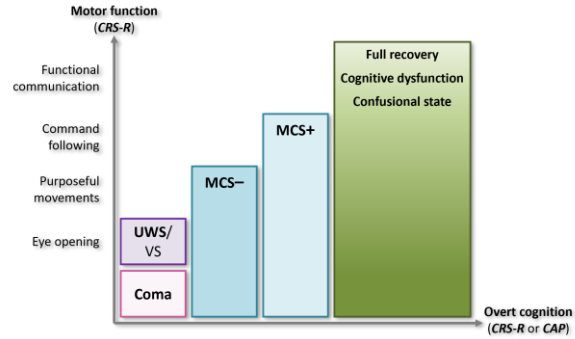




Guideline on the diagnosis of coma and other disorders of consciousness

RECOMMENDATIONS FOR DIAGNOSIS

- Repeat clinical assessments in the subacute and chronic setting, using the Coma Recovery Scale-Revised (CRS-R) to classify the level of consciousness
- Use salient stimuli and/or familiar activities examination to diagnose signs of covert consciousness

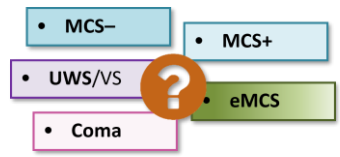


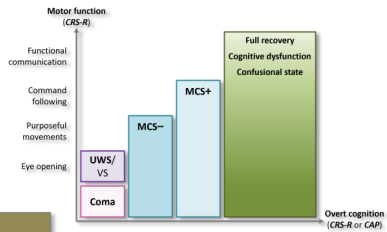
§Modifiziert nach Fischer und Edlow, JAMA Neurol 2024; 81: 405–415

DoC – Diagnostische Überlegungen im Kontext der neurologischen Prognosestellung

NARRATIVE REVIEW

Disorders of consciousness diagnosis, interventions, and prognostication for the intensivist: Report of the 2025 ISICEM roundtable



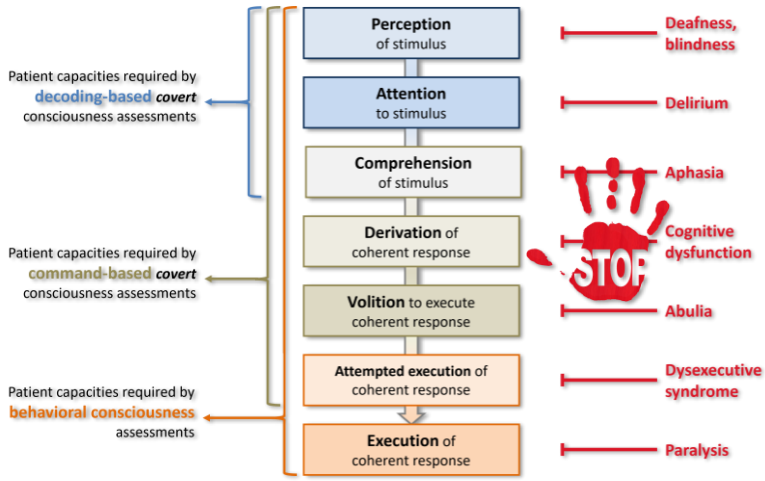


Diagnosis	Wakefulness	*Behavioral* responses	Key *behaviors*
Coma	Absent	Absent or reflexive	None
UWS/VS	Present	Absent or reflexive	Eye-opening, no purposeful responses
MCS–	Present	Present, ***without* language function**	Visual pursuit, localization to pain, automatic motor responses
MCS+	Present	Present, ***with* language function**	**Command-following**, intelligible expression
eMCS	Present	Present, with or without language function	Accurate yes/no communication, functional object use

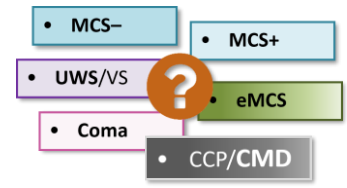
§Modifiziert nach Bodien et al., ***Intensive Care Med 2026***; 52: 42–62

DoC – Die «verborgene» Seite oder die «**nicht-verhaltensmanifeste**» Bewusstheit

Reconstructing Covert Consciousness
Neural Decoding as a Novel Consciousness Assessment



- Traditional ***behavioral*** **assessments require** a series of **intact capacities** for consciousness to be detected



[§]*Modifiziert nach Fischer et al., Neurology 2025; 104: e210208*

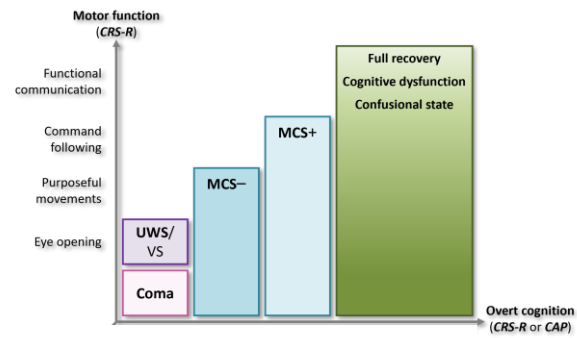
DoC – «Das Verborgene sichtbar machen …»

Guideline on the diagnosis of coma and other disorders of consciousness

- **Multimodal assessment** and **neuroimaging** is **necessary** to **avoid misdiagnosis**

CONCLUSIONS

- Clinical rating scales (CRS-R and the FOUR) and careful inspection of voluntary eye movements, EEG-based techniques and functional neuroimaging (fMRI, PET) should be integrated into a composite diagnoses standard
- High-density EEG, PET and fMRI are logistically challenging and require significant technological and computational expertise but enable refined patient evaluation
- Patients should be diagnosed with the highest level of consciousness as revealed by any of the three approaches (clinical, EEG, neuroimaging)



[§]*Modifiziert nach Fischer und Edlow, JAMA Neurol 2024; 81: 405–415*

DoC – «Steter Tropfen höhlt den Stein»

Guideline on the diagnosis of coma and other disorders of consciousness

- **Multimodal assessment** and **neuroimaging** is **necessary** to **avoid misdiagnosis**

The Repetition of Behavioral Assessments in Diagnosis of Disorders of Consciousness

CONCLUSIONS

- Clinical rating scales (CRS-R and the FOUR) and careful inspection of voluntary eye movements, EEG-based techniques and functional neuroimaging (fMRI, PET) should be integrated into a composite diagnoses standard
- Serial assessments may increase the diagnostic yield and reveal signs of consciousness in fMRI/PET and EEG paradigms in patients who initially lack such signs

TABLE 1. Misdiagnosis Rates of Patients After *n* CRS-R Assessments as Compared to the Reference Diagnosis

No. of CRS-R Assessments Used for Comparison With Reference Diagnosis	Misdiagnosis (reference diagnosis based on six CRS-R assessments, n = 123)	Effect Size (r = Z/sqrt(2n))	Misdiagnosis (reference diagnosis based on seven CRS-R assessments, n = 58)	Effect Size (r = Z/sqrt(2n))
One assessment	44 (36%) Z = 5.78***	0.37	28 (48%) Z = 4.62***	0.43
Two assessments	30 (24%) Z = 4.78***	0.30	20 (34%) Z = 3.92***	0.36
Three assessments	21 (17%) Z = 4.01***	0.26	15 (26%) Z = 3.41**	0.32
Four assessments	11 (9%) Z = 2.93*	0.19	10 (17%) Z = 2.80*	0.26
Five assessments	6 (5%) Z = 2.2; n.s.	0.14	6 (10%) Z = 2.2; n.s.	0.10
Six assessments	N/A	N/A	2 (3%) Z = 1.34; n.s.	0.03

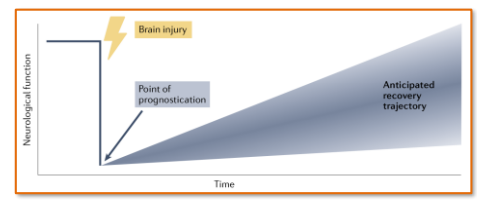
[5]*Modifiziert nach Wannez et al., Ann Neurol 2017; 81: 883–889*

DoC – Diagnostische Überlegungen im Kontext der neurologischen Prognosestellung

PERSPECTIVES

Neuroprognostication: a conceptual framework

- MCS–
- MCS+
- UWS/VS
- eMCS
- Coma
- CCP/CMD

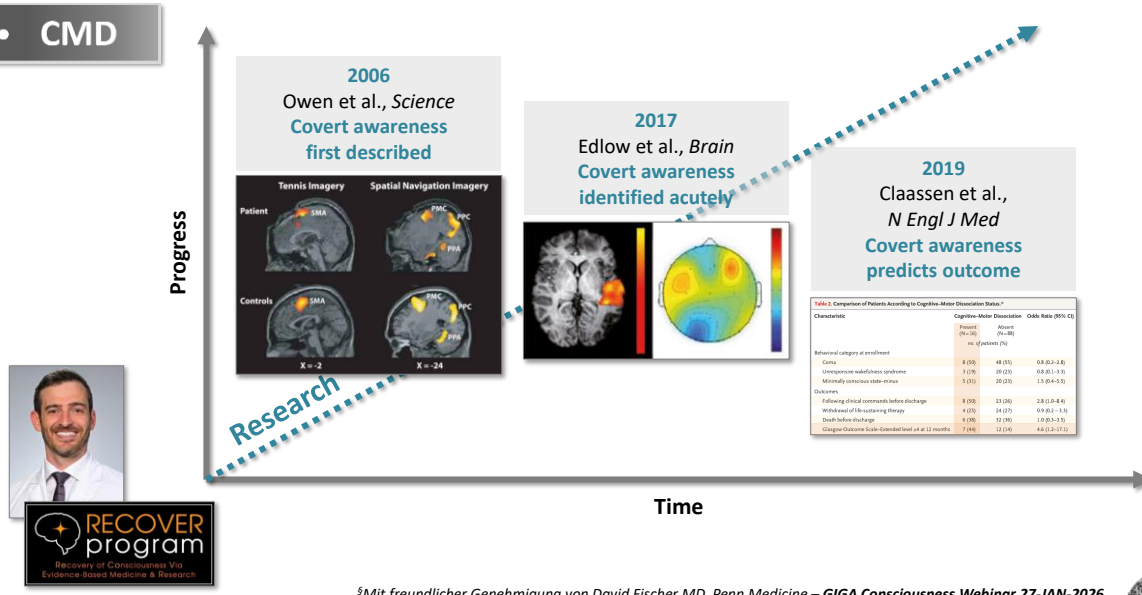


Characterization of neurological function		
Level of neurological function	**Behavior**	**Brain activity**
• **Communicative**	• Answers questions coherently • Follows commands	• Modulates activity to answer questions • Modulates activity to command
• **Responsive**	• Reaches for objects • Visually tracks target • Movement prompted by noxious stimulus	• Complex activity evoked by stimulus • Simple activity evoked by stimulus
• **Spontaneous**	• Spontaneous movements • Spontaneous eye opening	• Network connectivity • Spontaneous oscillations

[5]*Modifiziert nach Fischer et al., Nat Rev Neurol 2022; 18: 419–427*

CMD – Die akademische Perspektive

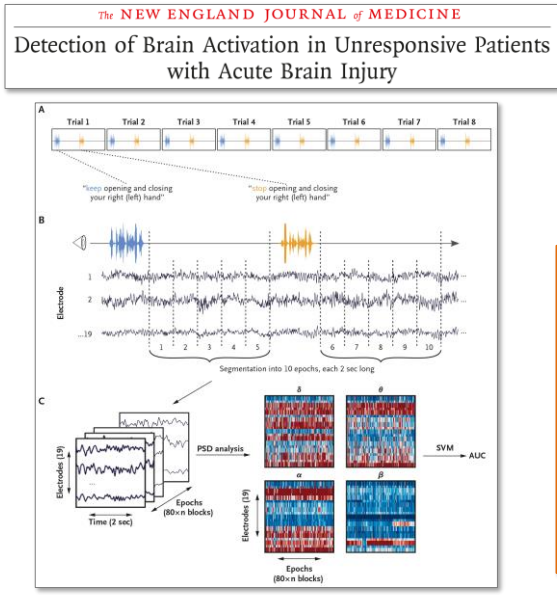
- **CMD**



RECOVER program
Recovery of Consciousness Via Evidence-Based Medicine & Research

[5]*Mit freundlicher Genehmigung von David Fischer MD, Penn Medicine* – ***GIGA Consciousness Webinar 27-JAN-2026***

«*Inverting the Turing Test – Machine Learning to Detect Cognition in the ICU*»



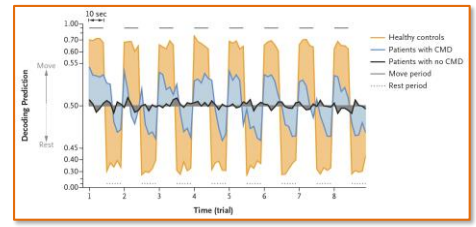


Table 2. Comparison of Patients According to Cognitive–Motor Dissociation Status.*

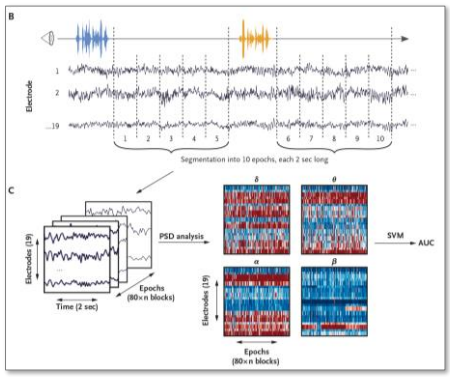
Characteristic	Cognitive–Motor Dissociation		Odds Ratio (95% CI)
	Present (N=16)	Absent (N=88)	
	no. of patients (%)		
Behavioral category at enrollment			
Coma	8 (50)	48 (55)	0.8 (0.2–2.8)
Unresponsive wakefulness syndrome	3 (19)	20 (23)	0.8 (0.1–3.3)
Minimally conscious state–minus	5 (31)	20 (23)	1.5 (0.4–5.5)
Outcomes			
Following clinical commands before discharge	8 (50)	23 (26)	2.8 (1.0–8.4)
Withdrawal of life-sustaining therapy	4 (25)	24 (27)	0.9 (0.2 – 3.3)
Death before discharge	6 (38)	32 (36)	1.0 (0.3–3.5)
Glasgow Outcome Scale–Extended level ≥4 at 12 months	7 (44)	12 (14)	4.6 (1.2–17.1)

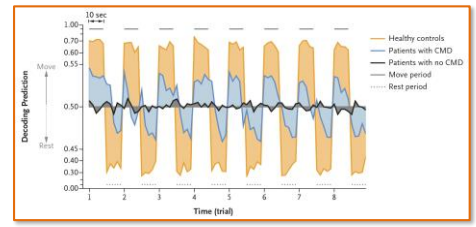
[5]*Modifiziert nach nach Claassen et al., N Engl J Med 2019; 380: 2497–2505*

«*Inverting the Turing Test – Machine Learning to Detect Cognition in the ICU*»

The NEW ENGLAND JOURNAL of MEDICINE

Detection of Brain Activation in Unresponsive Patients with Acute Brain Injury





- ***Brain activation*** **in response to commands** in **EEG recordings** was found in **15%** in a **consecutive series** of **patients** with **ABI**

Table 2. Comparison of Patients According to Cognitive–Motor Dissociation Status.*

Characteristic	Cognitive–Motor Dissociation		Odds Ratio (95% CI)
	Present (N=16)	Absent (N=88)	
	no. of patients (%)		
Behavioral category at enrollment			
Coma	8 (50)	48 (55)	0.8 (0.2–2.8)
Unresponsive wakefulness syndrome	3 (19)	20 (23)	0.8 (0.1–3.3)
Minimally conscious state–minus	5 (31)	20 (23)	1.5 (0.4–5.5)
Outcomes			
Following clinical commands before discharge	8 (50)	23 (26)	2.8 (1.0–8.4)
Withdrawal of life-sustaining therapy	4 (25)	24 (27)	0.9 (0.2 – 3.3)
Death before discharge	6 (38)	32 (36)	1.0 (0.3–3.5)
Glasgow Outcome Scale–Extended level ≥4 at 12 months	7 (44)	12 (14)	4.6 (1.2–17.1)

[§]Modifiziert nach nach Claassen et al., N Engl J Med 2019; 380: 2497–2505

«*Inverting the Turing Test – Machine Learning to Detect Cognition in the ICU*»

Table 2. Comparison of Patients According to Cognitive–Motor Dissociation Status.*

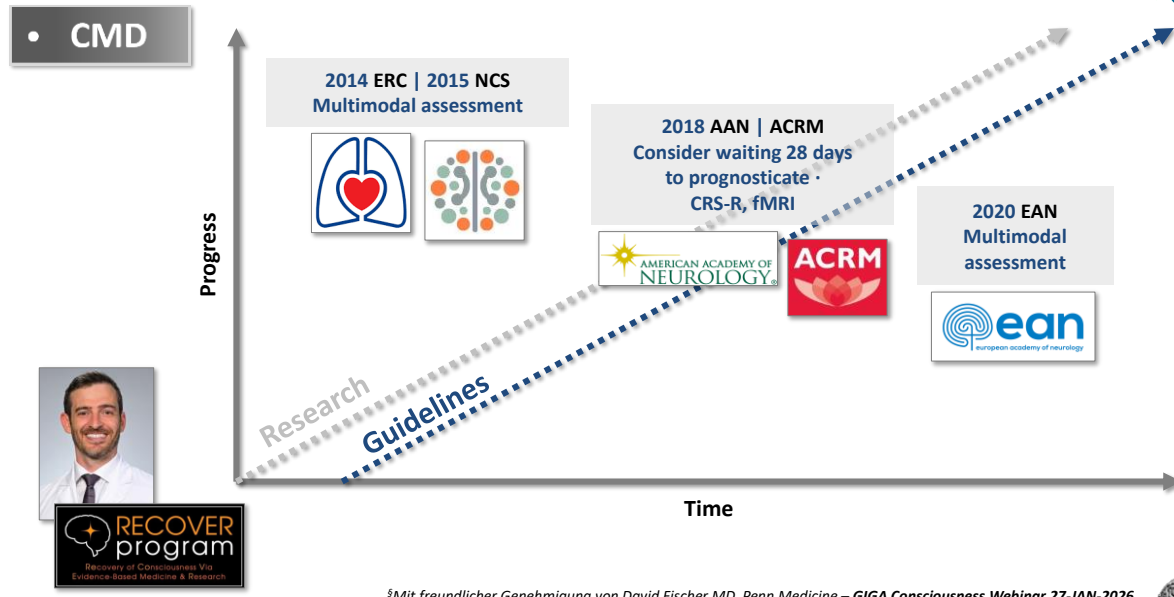
Characteristic	Cognitive–Motor Dissociation		Odds Ratio (95% CI)
	Present (N=16)	Absent (N=88)	
	no. of patients (%)		
Outcomes			
Death before discharge	6 (38)	32 (36)	1.0 (0.3–3.5)
Glasgow Outcome Scale–Extended level ≥4 at 12 months	7 (44)	12 (14)	4.6 (1.2–17.1)

GOSE 8-point scale	*Domain*	*Criteria*
1. Dead		
2. Vegetative State	Consciousness	
3. Lower SD	Function in Home	Unable to look after themselves for 8 h
4. Upper SD	Function in Home Function Outside the Home	Unable to look after themselves for 24 h OR Unable to shop OR Unable to travel
5. Lower MD	Work/Study Social and Leisure Activities Family and Friendships	Unable to work/study OR Unable to participate OR Constant problems
6. Upper MD	Work Social and Leisure Activities Family and Friendships	Reduced work capacity OR Participate much less OR Frequent problems
7. Lower GR	Social and Leisure Activities Family and Friendships Symptoms	Participate a bit less OR Occasional problems OR Some symptoms affecting daily life
8. Upper GR		No problems

A Manual for the Glasgow Outcome Scale-Extended Interview

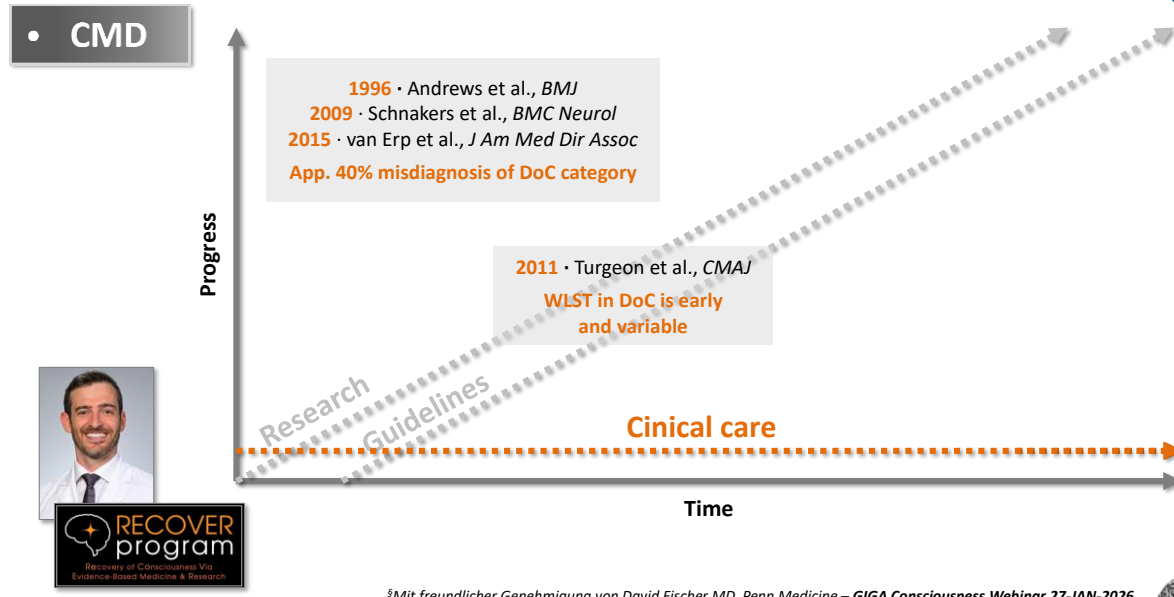
[§]Modifiziert nach nach Wilson et al., J Neurotrauma 2021; 38: 2435–2446

CMD – Perspektive der Evidenz-basierten Medizin



[5]Mit freundlicher Genehmigung von David Fischer MD, Penn Medicine – ***GIGA Consciousness Webinar 27-JAN-2026***

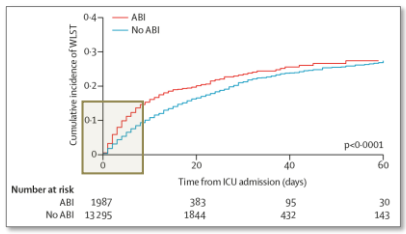
CMD – Die klinische Perspektive

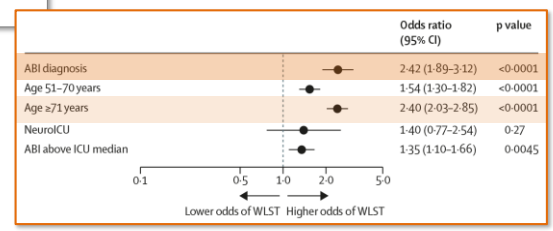


[5]Mit freundlicher Genehmigung von David Fischer MD, Penn Medicine – ***GIGA Consciousness Webinar 27-JAN-2026***

Acute Brain Injury – Epidemiologische Daten zu WLST

Decisions to withdraw or withhold life-sustaining therapies in patients with and without acute brain injury: a secondary analysis of two prospective cohort studies

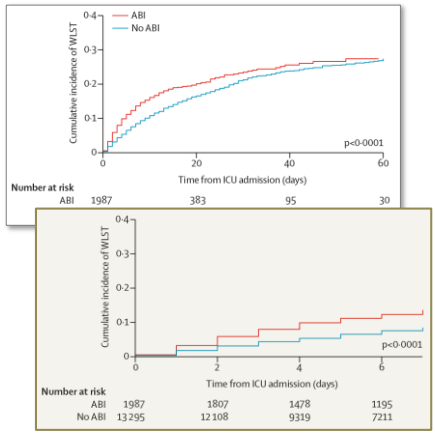


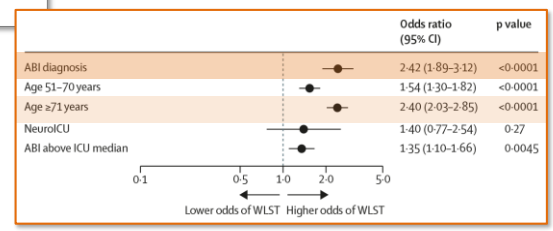


[5]*Modifiziert nach Taran et al., Lancet Respir Med 2025; 13: 338–347*

Acute Brain Injury – Epidemiologische Daten zu WLST

Decisions to withdraw or withhold life-sustaining therapies in patients with and without acute brain injury: a secondary analysis of two prospective cohort studies





- **WLST** decisions are **significantly more common** in patients **with ABI**
  - **Occur earlier** in this group
  - **Rationale** for **early WLST** following **ABI warrants further exploration**

[5]*Modifiziert nach Taran et al., Lancet Respir Med 2025; 13: 338–347*

CMD – Die klinische Perspektive

- **CMD**

RECOVER program
Recovery of Consciousness Via Evidence-Based Medicine & Research

1996 · Andrews et al., *BMJ*
2009 · Schnakers et al., *BMC Neurol*
2015 · van Erp et al., *J Am Med Dir Assoc*
App. 40% misdiagnosis of DoC category

2016 · Elmer et al., *Resucitation*
Patients with WLST after CA may have recovered

2011 · Turgeon et al., *CMAJ*
WLST in DoC is early and variable

2024 · Sanders et al., *J Neurotrauma*
Patients with WLST after TBI may have recovered

Progress

Research
Guidelines

Cinical care

Time

[5]*Mit freundlicher Genehmigung von David Fischer MD, Penn Medicine – **GIGA Consciousness Webinar 27-JAN-2026***

DoC – CMD und was nun?

- **CMD**

Table 2. Comparison of Patients According to Cognitive–Motor Dissociation Status.*

Characteristic	Cognitive–Motor Dissociation		Odds Ratio (95% CI)
	Present (N=16)	Absent (N=88)	
	no. of patients (%)		
Outcomes			
Death before discharge	6 (38)	32 (36)	1.0 (0.3–3.5)
Glasgow Outcome Scale–Extended level ≥4 at 12 months	7 (44)	12 (14)	4.6 (1.2–17.1)

Progress

«*Patients have a **right to die if** there is **no hope** **but** that they have a **right to care** if they might **benefit** from coming **advances** in **neuroscience**.*»

Medical Ethics
Joseph J. Fins, M.D., Chief

Weill Cornell Medicine
Joan and Sanford I. Weill
Department of Medicine

Research
Guidelines

Cinical care

Time

IFIMP | April 2026 | **INTENSIVMEDIZIN im GRENZBEREICH** | «*Ain't No Mountain High Enough*»

Bitte Ihre Fragen, Kommentare und Anmerkungen!

«*Time is out of joint. The rest is silence.*»

The Tragedy of Hamlet, Prince of Denmark; W. Shakespeare

Korrespondenz:
Assoz. Prof. Priv.-Doz. Dr. Ronny Beer
Neurologische Intensivstation | Univ.-Klinik für Neurologie
Medizinische Universität Innsbruck
A-6020 Innsbruck, Anichstraße 35
ronny.beer@i-med.ac.at