

2021 ERC/ESICM algorithm for prognostication of poor neurological outcome after cardiac arrest – can entry criteria be broadened?

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Purpose: Assess predictive ability of European Society of Intensive Care Medicine/ European Resuscitation Council (ESCIM/ERC) algorithm 2021 and individual prognostic markers and explore broadened entry criteria for the algorithm.

Methods: Retrospective multicenter observational study of post-cardiac arrest patients admitted to intensive care in four intensive care units in Skane, Sweden, between 2014-2018. All patients who remained comatose at 72 hours after cardiac arrest were assessed by multimodal neuroprognostication. Long-term neurological outcome was assessed at 2-6 months after cardiac arrest according to the Cerebral Performance Category scale. Poor outcome was defined as CPC 3-5.

Results: In this cohort (n=794) the 2021 ERC/ESICM algorithm predicted poor outcome (CPC 3-5) with FPR of 0% (CI 95% 0-94.9%) and 69.4% sensitivity (CI 95% 61.5-76.4%). Inclusion of patients with ongoing sedation at the time of neuroprognostication, generated FPR 0% (95%CI 0-82.2%) and 67.7% sensitivity (95%CI 60.2-74.4). Inclusion of all comatose patients (not obeying command, GCSM1-5) regardless of sedation, generated a FPR 0% (95%CI 0-22.8%) and 62% sensitivity (95%CI 54.8-68.7%).

Conclusion: In a cohort of patients admitted to intensive care after cardiac arrest the current ERC/ESICM 2021 algorithm for neuroprognostication predicted long-term poor neurological outcome with FPR 0%. Broadening inclusion criteria of the algorithm did not affect the FPR and sensitivity remained similar. Results are limited by high rates of withdrawal of life-sustaining therapy and few true negative cases.

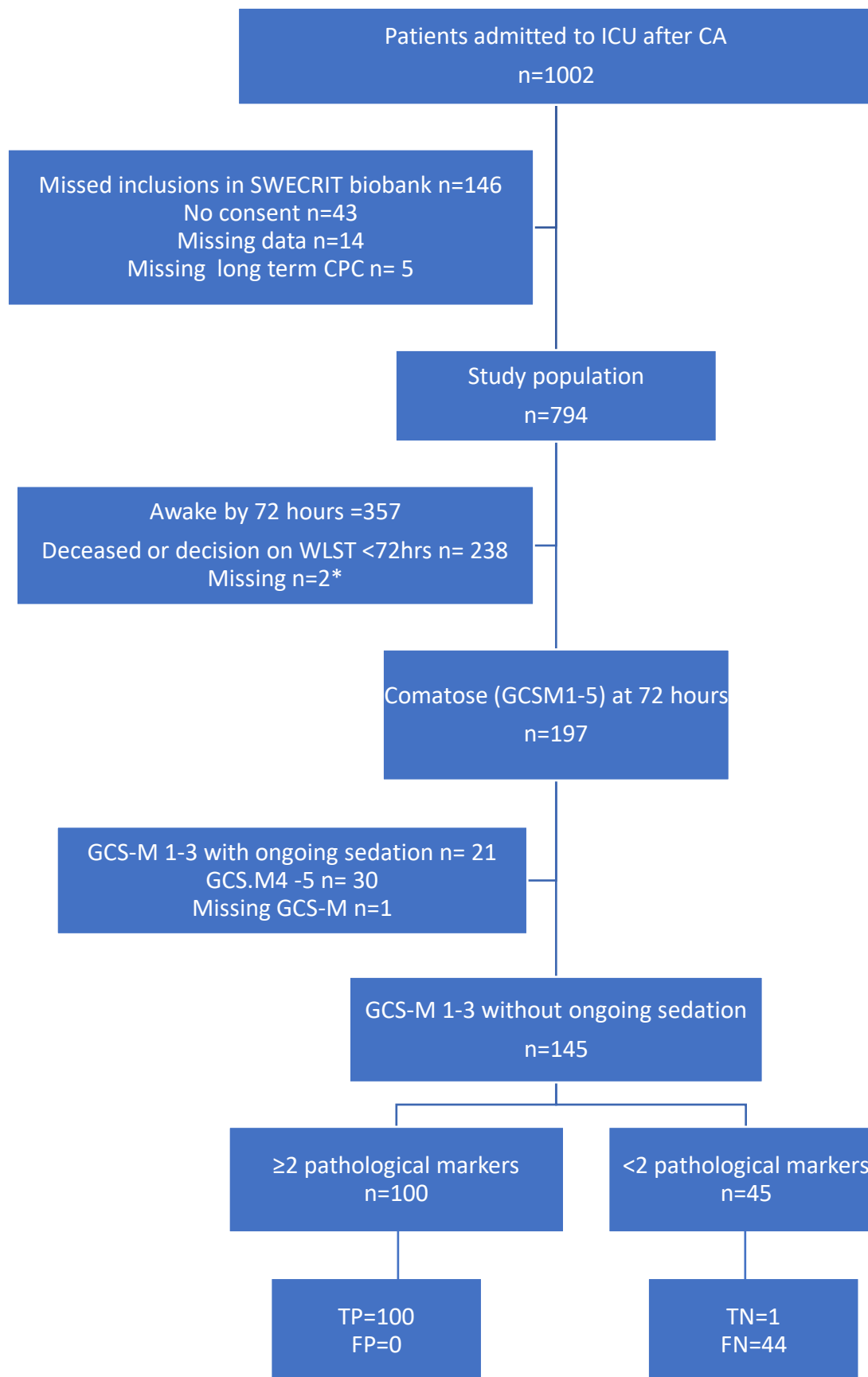


Figure 1. Study flowchart and validation of 2021 ESCIM/ERC neuroprognostication algorithm.

*Missing n=2 were moved to other hospitals outside the region before neuroprognostication.

Sensitivity 69.4% (CI95%: 61.5%-76.4%)
FPR 0% (CI95% 0-94.9%)

Any \geq 2 Pathological:

- No pupillary and corneal reflexes at \geq 72hrs
- Bilaterally absent N20 SSEP
- Highly malignant EEG >24hrs
- NSE >60ug/L at 48hrs and/or 72hrs
- Status myoclonus \leq 72hrs
- Diffuse and extensive anoxic injury on brain CT/MRI

Definitions:

TN= True Negative= Predicted & reported good outcome

TP= True Positive= Predicted & reported poor outcome

FN= False Negative=Predicted good & reported poor outcome

FP= False Positive= Predicted poor & reported good outcome

Good outcome= CPC 1-2

Poor outcome= CPC 3-5