Transfusion strategies In brain injured patients

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1. TRANSFUSION STRATEGIES IN BRAIN INJURED PATIENTS

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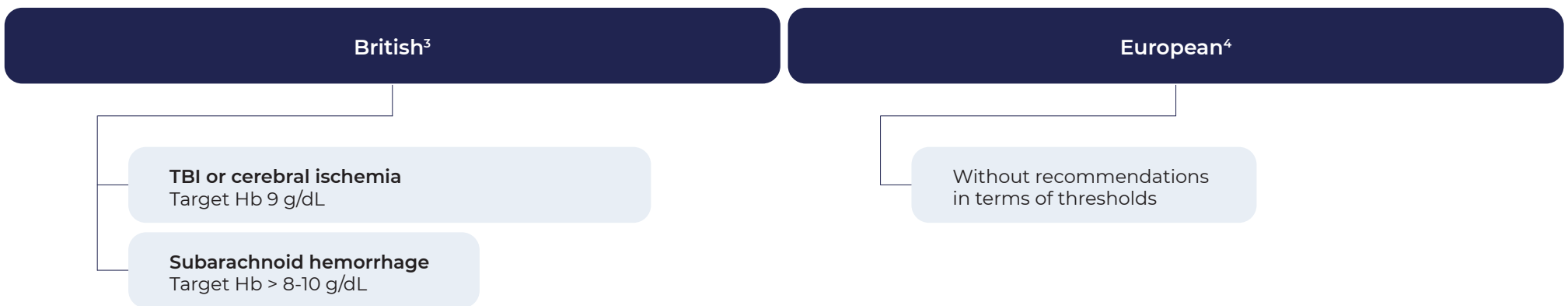
Anemia can worsen secondary cerebral hypoxia after a traumatic brain injury (TBI)[1,2]. However, red blood cell transfusion has also been associated to worse outcomes[3].

Clinical practice guidelines indicate the following in terms of applicable hemoglobin thresholds:



In practice, it has been observed that the use of thresholds varies between countries:

- USA: 8.2-8.9 g/dL
- Canada: 7 g/dL
- Sweden: > 10 g/dL

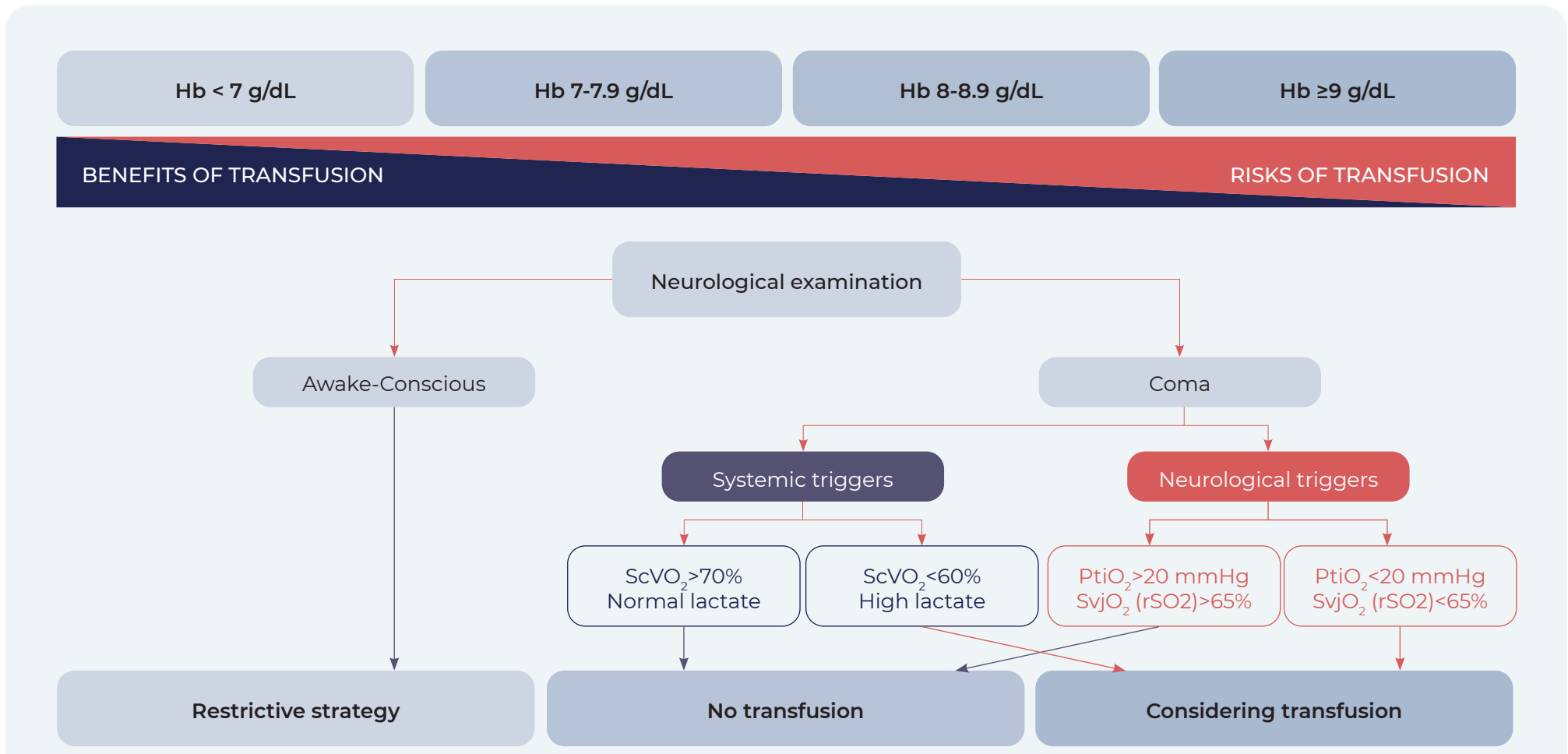
APPROACH: RED BLOOD CELL TRANSFUSION

Its effect on brain oxygenation is unclear, as well as its efficacy and safety (variability between studies):

- **Naidech et al. (2010)**: Similar safety to liberal management in patients with subarachnoid hemorrhage[6].
- **Desjardins et al (2012):** There is not enough evidence to confirm differences as to the effect between restrictive and liberal targets in neurocritical patients[7].
- **Robertson et al (2014):**): In patients with TBI, liberal management does not improve neurological outcomes after 6 months and it is associated with a higher incidence of adverse events[8].
- **Yamal et al (2015):** No clinically significant differences or effects on long-term neurological outcomes or in mortality between liberal and restrictive management[9].
- **Vedantam et al (2016):** Potential adverse effects with liberal management after a severe TBI[10].
- **Gobatto et al (2019):** Lower hospital mortality and better neurological status after 6 months with liberal rather than restrictive management in patients with TBI[11].

INDIVIDUALIZATION OF THE APPROACH

Fixed hemoglobin targets should not be used to make decisions, but transfusion triggers[12,13].



Hb: hemoglobin. $ScVO_2$: central venous O_2 saturation. $PtiO_2$: O_2 tissue pressure. $SvjO_2$: O_2 jugular saturation.

NEED FOR RESEARCH AND DATA

Further randomized controlled trials are needed to assess the usefulness of red blood cell transfusion to increase hemoglobin in patients with TBI. The following studies are currently ongoing:

Taccone FS, et al. TRansfusion strategies in Acute brain INjured patients (**TRAIN**): a prospective multicenter randomized interventional trial protocol. Trials. 2023 Jan 7;24[1]:20. doi: 10.1186/s13063-022-07061-7.

Turgeon AF, et al; HEMOTION Trial Team, the Canadian Critical Care Trials Group, the Canadian Perioperative Anesthesia Clinical Trials Group and the Canadian Traumatic Brain Injury Research Consortium. Haemoglobin transfusion threshold in traumatic brain injury optimisation (**HEMOTION**): a multicentre, randomised, clinical trial protocol. BMJ Open. 2022 Oct 10;12[10]:e067117.

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LITERATURE

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