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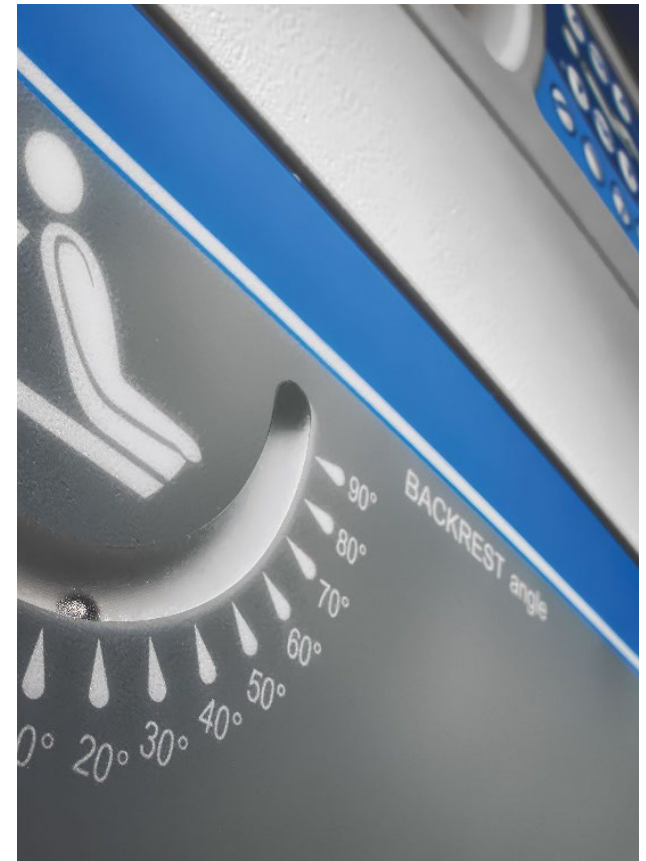
ISC 2024 Main Event
ZODIAC Trial Results
2.8.2024

Zero Degree Head Positioning in Acute large vessel ischemic stroke (ZODIAC)

- 1968 James Toole, MD first identified marked clinical deterioration in acute stroke patients when the head was positioned upright.
- 1976 Caplan and Sergay coined the term, positional cerebral ischemia.
- Numerous small studies have identified improved blood flow in hyperacute stroke patients with the head positioned down
- Multisite, prospective randomized outcome-blinded evaluation (PROBE) clinical trial: 12 (5 academic, 7 community, 10 CSC and 2 TSC) hospitals across the USA

Hypothesis:

Patients with large artery occlusions placed in 0° head position will experience less early neurological deterioration within the time prior to thrombectomy, than those in the 30° head elevation group.



Zero Degree Head Positioning in Acute large vessel ischemic stroke (ZODIAC)

- Traditional positioning used a 30-degree head elevation height and was based on patients with increased intracranial pressure (ICP) that were primarily traumatic brain injury patients; Alexandrov's pilot work showed that hyperacute ischemic stroke patients with viable brain do not have increased ICP
- Additional pilot work by Alexandrov showed that positioning hyperacute large vessel occlusion (LVO) patients with the head down at 0-degrees increased blood flow to the ischemic brain by 20%:
 - Increased gravitational blood flow through the narrowed/blocked artery
 - Increased collateral arterial blood flow

ZODIAC Trial

- **Main Findings:**

- For every 1.88 LVO thrombectomy patients positioned with the HOB up at 30-degrees, 1 will deteriorate by 2 or more points on the NIH Stroke Scale (NIHSS); $p < 0.001$
- For every 2.48 LVO thrombectomy patients positioned with the HOB up at 30-degrees, 1 will deteriorate by 4 or more points on the NIHSS; $p < 0.001$
- No patients had aspiration pneumonia or other pulmonary complications
- Fewer all-cause dates occurred in the 0-degree group (4.44%), compared to the 30-degree group (21.74%; $p = 0.03$) during the first 3 months

- **Exploratory Findings:**

- 86.67% of 0-degree patients vs. 60.87% of 30-degree patients had improved NIHSS scores from baseline at 24 hours after thrombectomy ($p = 0.008$)
- 86.7% of 0-degree patients vs. 67.4% of 30-degree patients had improved NIHSS scores from baseline at discharge or day 7 (whichever came first; $p = 0.045$)
- There was no difference in modified Rankin Score at 3-months, but 0-degree patients were discharged from hospital with less need for rehabilitation compared to 30-degree patients

ZODIAC Trial

- **Conclusions:**

- 0° head positioning is safe and imparts stability and clinical improvement in LVO patients during the pre-thrombectomy period, making it an important rescue procedure
- Use of 0° positioning may be one of the most important first steps in managing a LVO thrombectomy candidate
 - *This is critically important when immediate access to thrombectomy is unavailable, especially in those LVO patients requiring hospital-to-hospital transfer for thrombectomy*