



Brain Pro-TCT: Quality improvement of delirium detection on a cardiothoracic surgical ward

**THORAX
CENTRUM
TWENTE**

Miarca ten Broeke, MANP¹, Dr. Frank R. Halfwerk^{1,2}, Wim P.R. Henckens, MANP¹

Anna Weierink, MSc³, Dr. Ab G. Hensens¹, Prof. Dr. Job van der Palen^{4,5}

¹ Thoraxcentrum Twente, Medisch Spectrum Twente (MST), ² Dept. of Biomechanical Engineering, University of Twente, ³ Psychiatry, MST, ⁴ Dept of Epidemiology, MST, ⁵ Section cognition, data and education, University of Twente, Enschede, the Netherlands

LESSONS LEARNED

- ✓ Delirium is perceived as a problem for others → It is a problem for all stakeholders!
- ✓ Involve all stakeholders early in the innovation project
- ✓ Objective screening of delirium changes nurses' perspective to the individual patient
- ✓ Measure change as objective as possible
- ✓ Interim analysis: decrease in length of hospital stay

1. CONTEXT AND PROBLEM

Delirium:

- is a syndrome of acute brain failure
- presents as hypo-active, hyper-active or mixed
- associated with adverse long-term outcomes, more readmissions to hospital, decreased cognitive and functional outcomes

DOSS (Delirium Observation Scale Score):

- Incidence of delirium of 13 to 17% in elective patients aged ≥45 years (Koster, 2012, Ten Broeke, 2018)
- Subjective: hypo-active delirium is often missed

DeltaScan® (a new medical device):

- Single-channel electroencephalography (EEG) to screen delirium based on detection of delta waves
- Objective: finds delirium more often and earlier?

Hypotheses:

Early delirium detection allows early treatment of underlying causes and shorter hospital stay for patients ≥ 70 years following cardiac surgery

- 1) Delirium incidence increases from 15% to 30%
- 2) Length of stay reduction with at least 1.5 days

2. INTERVENTION AND STRATEGY FOR CHANGE

Quality improvement project on thoracic surgery ward:

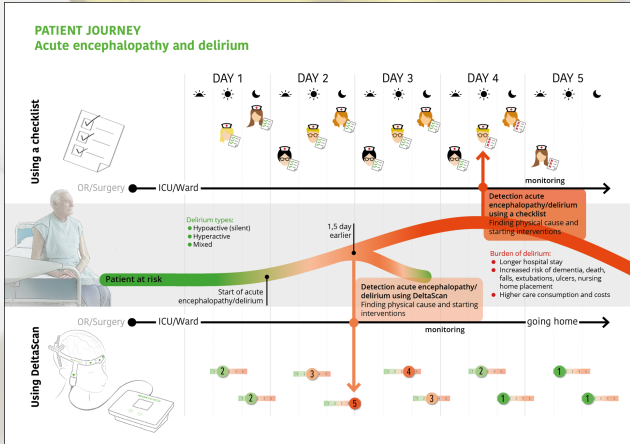
- Education on the importance of delirium screening
- Training to nurses, nurse practitioners and physicians
- Working group with nurses and nurse practitioners

First cohort:

- Using DOSS as standard care
- 3 times a day post-operative on the ward

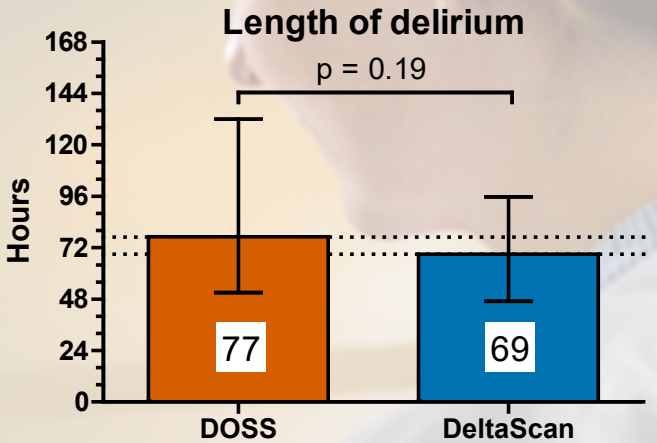
Second cohort:

- Using DeltaScan® as standard care
- 2 times a day post-operative on the ward

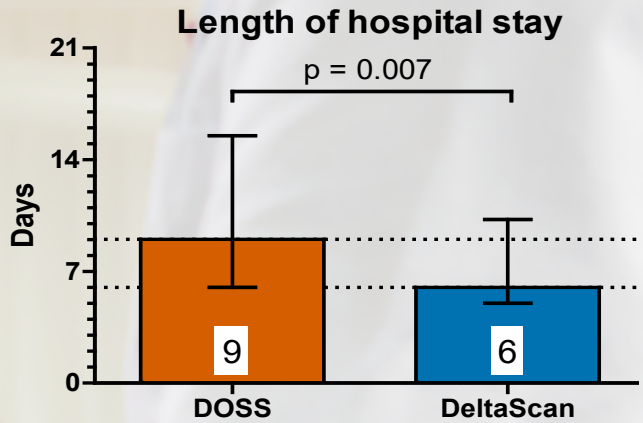


3. EFFECTS OF CHANGES (INTERIM ANALYSIS)

Delirium incidence increased significantly from 15% (67/444) to 21% (58/276), $p = 0.041$



Length of delirium decreased not significantly from 77 (51 to 132) hours (DOSS cohort) to 69 (47 to 96) hours (DeltaScan® cohort), $p = 0.19$



Length of hospital stay decreased significantly from 9 (6 to 16) days (DOSS cohort) to 6 (5 to 10) days (DeltaScan® cohort), $p = 0.007$

4. QUALITY VS COSTS (INTERIM ANALYSIS)

Quality improvement?

- Length of stay ↓
- Delirium duration did not change

Costs?

- Screening costs (device and disposables) ↑
 - Length of stay ↓
- Cost-effectiveness: at end of study

5. SETTING AND FUNDING

Cardiothoracic surgery ward, Thoraxcentrum Twente Medisch Spectrum Twente, Enschede, the Netherlands, non-academic teaching hospital

Inclusion period and number of patients

- DOSS from April 2021 till May 2022 $n = 444$
- DeltaScan® from May 2022 ongoing $n = 276$

Funding

- Part of the costs are covered by Hartcentrum Twente Foundation
- Prolira provided training and DeltaScan® devices during the study period free of charge and applied a discount to the disposable patch costs

CONTACT

m.tenbroeke@mst.nl

Miarca ten Broeke, MANP

