

Development and validation of an INTERNATIONAL PREOPERATIVE RISK ASSESSMENT MODEL for postoperative delirium



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1. THE PROBLEM

A robust pre-surgical risk assessment for postoperative delirium (POD) is required to find patients at risk.

1 POD underdiagnosed = data quality problem!

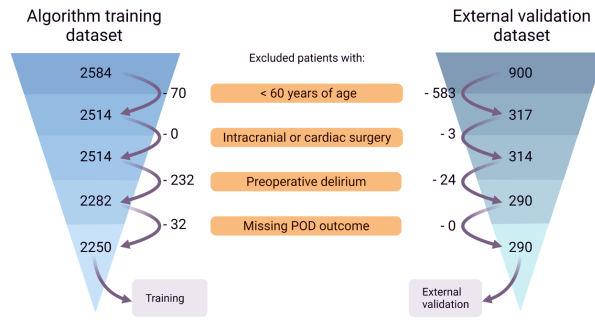
2 Single centre studies are not robust enough

2. DATA COLLECTION

We performed an individual patient data meta-analysis collecting over 20'000 patients from over 22 studies.

8 studies passed our quality control (every patient assessed for POD) and were included in algorithm development.

To externally validate our algorithm, we used data from a prospective quality control study performed at a hospital in Switzerland.



Hospitals:



Coordinators:



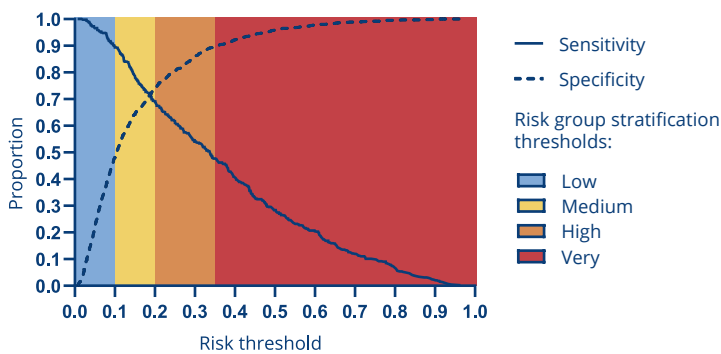
3. THE RESULTS

Algorithm has been developed into a software as a Medical device and is approved for clinical use.

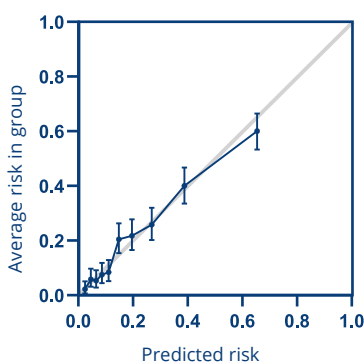
Performance: Cross-validation AUC of 0.80 (95% CI: 0.77-0.82). Three thresholds for patient stratification are shown, together with sensitivity and specificity. External validation AUC 0.76 (95% CI: 0.69-0.83). Calibration plots below:



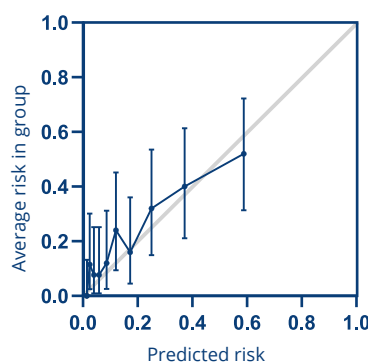
Classification plot



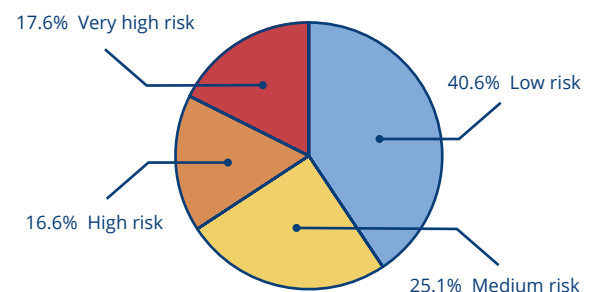
Calibration plot: internal validation



Calibration plot: external validation



Distribution of patients according to risk groups



4. CLINICAL CONSEQUENCES

The evaluated risk of neurocognitive complications allows clinics to adopt protective personalized peri-operative measures.

- Low**
- Medium**
- High**
- Very high**

Example actions

- No further action
- For awareness (e.g. monitoring of precipitating factors)
- Extra nursing time allocated e.g. for reorientation
- Allocate rare resources (geriatrician) to most at-need patients

Approved for clinical use in Europe



- ✓ For all inpatients over age 60
- ✗ Excludes cardiac & intracranial surgery