**Supplemental Table 23. Studies on prediction models**

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| **Article** | **Study Design** | **Number of delirious / Total (%)** | **Type IC** | **Method Delirium Assessment** | **Inclusion** | **Exclusion** | | **Predictors** | **Predictor**  **Effect Estimate** | | | **Outcome**  **Model** | | | | | | **Quality** |
| vd Boogaard 2012 [1] | Prospective Cohort  Multicenter | 911/3056 (30%) | Mixed  ICU | CAM-ICU  8hrly  *Bedside* | LOS ICU>24hrs | Persistent Coma  Delirious <24hrs after admission  Auditory/visual impairment  Mentally disbaled  CNS disorder  Compliance rate CAM-ICU <80% | | Age APACHE II  Coma  No  Drug induced  Miscellaneous  Combination  Admission category  Surgery  Medical  Trauma  Neurosurgery  Infection  Metabolic acidosis  Use of morphine  None  0.01-7.1 mg  7.2-18.6 mg  >18.6 mg  Use of sedatives  Urea concentration (mmol/L)  Urgent admission | 1.04  1.06  Ref  1.7  14.9  17.1  Ref  1.4  3.1  4.0  2.9  1.3  Ref  1.5  1.1  1.7  4.0  1.0  1.5 | | |  | ICU Delirium Incidence  Logistic Regression | | | | | ++ |
| Comments | * Internal validation: bootstrapping, temporal validation. External validation: 4 other Dutch Hospitals. Pooled results presented here. AUROC 0.85 (95% CI 0.82-0.87) * Predictors available within 24 hours of admission. * Predictor Effect Estimate: OR is the natural logarithm of the logistic regression coefficients of the prediction model. No 95% CI given. | | | | | | | | | | | | | | | |  |
| ICU: Intensive Care unit, CAM-ICU: Confusion Assessment Method for use in the ICU, LOS: Length of stay, CNS: Central Nervous System, APACHE II: Acute Physiology and Chronic Health Evaluation II, AUROC: area under the receiver operating characteristic curve, hrly: hourly, hrs:hours, hr: hour, OR: odds ratio, CI: confidence interval | | | | | | | | | | | | | | | | | | |
| **Article** | **Study Design** | **Number of delirious / Total (%)** | **Type IC** | **Method Delirium Assessment** | **Inclusion** | | **Exclusion** | **Predictors** | | | **Predictor**  **Effect Estimate** | | | **Outcome**  **Model** | | | | **Quality** |
| vd Boogaard 2014 [2] | Prospective  Cohort  Multicenter | 410/1824  (22,5%) | Mixed  ICU | CAM-ICU  12hrly  *Bedside* | All patients | | Delirious within 24 hrs  Comatose during ICU stay  ICU LOS < 24 hrs  Auditory or visual disorders  Unable to understand language  Severely mentally disabled  Serious receptive aphasia  Compliance rate CAM-ICU <80% | Age  APACHE II score  Coma  No  Drug induced  Miscellaneous  Combination  Admission category  Surgery  Medical  Trauma  Neurosurgery  Presence of infection  Presence of metabolic acidosis  Use of morphine  None  0.01-7.1 mg  7.2-18.6 mg  >18.6 mg  Use of sedatives  Urea concentration (mmol/L)  Urgent admission | | | 1.02  1.03  Ref  1.29  2.92  3.80  Ref  1.16  1.70  1.92  1.64  1.15  Ref  1.21  1.06  1.27  1.93  1.01  1.21 | | |  | | ICU Delirium Incidence  Logistic Regression | | ++ |
|  | Comments | * Multinational recalibration of the prediction model proposed in vd Boogaard 2012. AUROC 0.76 (95% CI 0.74-0.79) * Predictor Effect Estimate: OR is the natural logarithm of the logistic regression coefficients of the prediction model. No 95% CI given. | | | | | | | | | | | | | | | |  |
| Guenther 2013 [3] | Prospective Cohort | 69/215 (32,1%) | Cardiac ICU | CAM-ICU  12-24 hrly  *Bedside* | Elective or urgent cardiac surgery | | Non-German speaking  Participation in other studies  Age < 50 years  Transfer from other departments  Patients needing urgent surgery | Age (years)  MMSE (points)  Charlson (points)  Length of CPB (min)  SIRS (ever vs never) | 1.664  1.673  1.590  1.738  4.765 | | | (1.099-2.518)  (1.140-2.455)  (1.072-2.358)  (1.198-2.520)  (1.950-11.638) | | | | | ICU Delirium Incidence  Logistic Regression | + |
| ICU: Intensive Care unit, CAM-ICU: Confusion Assessment Method for use in the ICU, hrly, hourly, LOS: Length of stay, APACHE II: Acute Physiology and Chronic Health Evaluation II, AUROC: area under the receiver operating characteristic curve, hrs:hours, hr: hour, OR: odds ratio, CI: confidence interval, MMSE: minimal mental state examination, CPB: cardiopulmonary bypass, SIRS: systemic inflammatory response syndrome. | | | | | | | | | | | | | | | | | | |
| **Article** | **Study Design** | **Number of delirious / Total (%)** | **Type IC** | **Method Delirium Assessment** | **Inclusion** | | **Exclusion** | **Predictors** | **Predictor**  **Effect Estimate** | **Outcome**  **Model** | | | | | | | | **Quality** |
| Wassenaar 2015 [4] | Prospective  Cohort  Multicenter | 481/1962  (24,5%) | Mixed  ICU | CAM-ICU  8/12hrly  *Bedside* | Age ≥ 18 years | | Delirious at admission  ICU LOS < 24 hrs  Unable to assess for delirium  Compliance rate CAM-ICU <80% | Age  History of cognitive impairment  History of alcohol abuse  Admission category  Surgery  Medical  Trauma  Neurology/neurosurgery  Urgent admission  MAP at ICU admission  Use of corticosteroids  Respiratory failure  BUN at ICU admission | 1.03  2.41  1.66  Ref  1.45  3.38  1.66  1.84  0.99  1.33  2.67  1.02 | (1.02-1.03)  (1.70-3.40)  (1.17-2.35)  (1.06-1.98)  (2.00-5.74)  (1.06-2.58)  (1.33-2.56)  (0.99-1.00)  (1.00-1.77)  (2.10-3.40)  (1.01-1.03) | | | | | ICU Delirium Incidence  Logistic Regression | | | ++ |
| Comments | * Development and validation of a prediction model with predictors readily available at ICU admission. Validation dataset AUROC 0.75 (95% CI 0.71-0.79) * Predictor Effect Estimate: OR is the natural logarithm of the logistic regression coefficients of the prediction model. | | | | | | | | | | | | | | | |  |
| ICU: Intensive Care unit, CAM-ICU: Confusion Assessment Method for use in the ICU, hrly: hourly, LOS: Length of stay, MAP: mean arterial blood pressure, BUN: blood urea nitrogen, AUROC: area under the receiver operating characteristic curve, hrs:hours, hr: hour, OR: odds ratio, CI: confidence interval. | | | | | | | | | | | | | | | | | | |

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