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| **Table 3.** Predictions of hypothyroidism and readmission for all patients. | | | |
|  | Predicted probability of hypoparathyroidism | | |
|  | **Low risk**  (p < 10%)  n=229 | **Intermediate risk**  (10% ≤ p ≤ 30%)  n=74 | **High risk**  (p > 30%)  n=63 |
| Long-term hypoparathyroidism | 4 (1.7%) | 12 (16.2%) | 28 (44.4%) |
| No long-term hypoparathyroidism | 225 (98.3%) | 62 (83.8%) | 35 (55.6%) |
| Readmission | 2 (0.9%) | 7 (9.5%) | 18 (28.6%) |
| No readmission | 227 (99.1%) | 67 (90.5%) | 45 (71.4%) |
| The predictions are averaged over the ten imputed data sets. | | | |

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| **Table 4.** Full, refitted, and redeveloped model predicting readmission without shrinkage. | | | | | | | | | | | | |
|  | Refitted full model | | | Refitted final model | | | Calibrated model | | | Redeveloped model | | |
|  | OR | 95% CI | Imp. | OR | 95% CI | Imp. | OR | 95% CI | Imp. | OR | 95% CI | Imp. |
| Intercept | 0.00 | [0.00; 0.00] |  | 0.00 | [0.00; 0.00] |  | 0.00 | [1.46; 2.61] |  | 0.00 | [0.00; 0.00] |  |
| ΔPTH  (1% increase) | 1.09 | [1.03; 1.15] | 9.3 | 1.09 | [1.03; 1.16] | 10.1 | 1.07 | [1.04; 1.11] | 22.5 | 1.09 | [1.04; 1.16] | 10.2 |
| Corrected calcium at 24 hours  (0.2 versus 0.1) | 1.55 | [1.12; 2.14] | 7.2 | 1.55 | [1.13; 2.12] | 7.3 | 1.40 | [1.11; 1.78] | 7.8 | 1.55 | [1.13; 2.12] | 7.3 |
| Parathyroid gland not seen during surgery | 1.29 | [0.35; 4.83] | 0.1 | 1.13 | [0.32; 3.97] | 0.0 | 3.57 | [1.57; 8.09] | 9.3 |  |  |  |
| Age in years  (i.q.r. 69 versus 42 years) | 1.26 | [0.56; 2.85] | 0.3 |  |  |  |  |  |  |  |  |  |
| Males versus females | 0.56 | [0.20; 1.57] | 1.2 |  |  |  |  |  |  |  |  |  |
| Completion surgery versus total | 0.50 | [0.05; 4.74] | 0.4 |  |  |  |  |  |  |  |  |  |
| Central LND = Yes versus No | 0.95 | [0.35; 2.55] | 0.0 |  |  |  |  |  |  |  |  |  |
| *C-index uncorrected for optimism* | 0.89 | [0.85; 0.94] |  | 0.88 | [0.84; 0.93] |  | 0.87 | [0.82; 0.92] |  | 0.88 | [0.84; 0.93] |  |
| Table displays odds ratios and the 95% confidence intervals of the logistic regression model predicting the probability of readmission. The redeveloped model is selected using backward selection with p-values < 0.05. The coefficients are averaged over the ten imputed data sets. ~~The C-index is corrected for optimism by bootstrapping.~~ Abbreviations: OR, odds ratio; CI, confidence interval, Imp., importance defined by the Chi-square of the Wald-statistic; PTH, parathyroid hormone; ΔPTH, (PTH at baseline - postoperative PTH after 24 hours) / (PTH at baseline) x 100%; Corrected calcium, measured calcium (mmol/L) + 0.016 x (34 - albumin (g/L)); LND, lymph node dissection. | | | | | | | | | | | | |

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| **Refitted full model** | **Refitted final model** | **Calibrated model**  Calibration factor averaged over ten imputations: 0.81 [0.46; 1.15] | **Redeveloped model** |
| Z:\Project Predict Hypoparathyroidism\Development\Results\model.performance.full.refitted.model.png | Z:\Project Predict Hypoparathyroidism\Development\Results\model.performance.final.refitted.model.png | Z:\Project Predict Hypoparathyroidism\Development\Results\model.performance.calibrated.model.png | Z:\Project Predict Hypoparathyroidism\Development\Results\model.performance.redeveloped.model.png |
|  | **Refitted final model shrunk**  Shrinkage factor hypoparathyroidism: 0.86825232 |  | **Redeveloped final model shrunk**  Shrinkage factor readmission: 0.88708469 |
|  | Z:\Project Predict Hypoparathyroidism\Development\Results\model.performance.refitted.final.shrunk.model.png |  | **Z:\Project Predict Hypoparathyroidism\Development\Results\model.performance.redeveloped.shrunk.model.png** |

**Supplemental table 3. PTH and readmission**. ΔPTH is averaged over the ten imputed data sets.

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|  | PTH < 70% | PTH 70% |
| Long-term hypoparathyroidism | 2 | 42 |
| No long-term hypoparathyroidism | 214 | 108 |
| Hypocalcemia-related readmission | 0 | 27 |
| No hypocalcemia-related readmission | 216 | 123 |