

**Table SI.** Demographic and clinicopathological parameters of the study participants (n=18,642).

| Parameter                      | Value        |
|--------------------------------|--------------|
| BMI, kg/m <sup>2</sup>         | 28.69±6.72   |
| Na, mmol/l                     | 138.62±3.22  |
| BUN, mg/dl                     | 17.39±8.31   |
| Cr, mg/dl                      | 0.87±0.45    |
| WBC, x10 <sup>9</sup> /l       | 9.50±4.48    |
| HCT, %                         | 40.35±4.81   |
| PLT, x10 <sup>9</sup> /l       | 243.4±76.90  |
| Sex                            |              |
| Male                           | 8836 (47.40) |
| Female                         | 9806 (52.60) |
| Age ranges, years              |              |
| 18-40                          | 3057 (16.40) |
| 41-60                          | 7742 (41.53) |
| 61-80                          | 7233 (38.80) |
| >81                            | 601 (3.27)   |
| Postoperative 30-day mortality | 458 (2.46)   |

Values are expressed as the mean ± standard deviation or n (%). BMI, body mass index; Na, blood sodium; BUN, blood urea nitrogen; Cr, creatinine; WBC, white blood cells; HCT, hematocrit; PLT, platelets.

**Table SII.** Risk predictors for incident postoperative 30-day mortality in the univariate and multivariate analysis.

| <b>Risk factor</b>                         | <b>Univariate, OR (95%CI) P-value</b> | <b>Multivariate, OR (95%CI) P-value</b> |
|--------------------------------------------|---------------------------------------|-----------------------------------------|
| Sex (female vs. male)                      | 0.649 (0.538, 0.783) <0.00001         | 0.713 (0.579, 0.878) 0.00147            |
| Ethnicity                                  |                                       |                                         |
| Asian vs. white                            | 0.758 (0.402, 1.431) 0.39264          |                                         |
| African American vs. white                 | 0.930 (0.629, 1.374) 0.71394          |                                         |
| Unknown vs. white                          | 1.154 (0.919, 1.451) 0.21811          |                                         |
| Age, years (vs. 18-40)                     |                                       |                                         |
| 41-60                                      | 2.682 (1.692, 4.250) 0.00003          | 1.927 (1.200, 3.094) 0.00664            |
| 61-80                                      | 4.940 (3.156, 7.733) <0.00001         | 2.573 (1.596, 4.148) 0.00011            |
| >81                                        | 14.902 (8.962, 24.776) <0.00001       | 6.680 (3.836, 11.634) <0.00001          |
| BMI, kg/m <sup>2</sup>                     | 0.985 (0.971, 0.999) 0.04193          | 0.997 (0.982, 1.013) 0.73708            |
| Diabetes (yes vs. no)                      |                                       |                                         |
| Noninsulin-dependent                       | 1.552 (1.140, 2.113) 0.00529          | 1.059 (0.760, 1.476) 0.73628            |
| Insulin-dependent                          | 2.618 (1.904, 3.598) <0.00001         | 1.360 (0.953, 1.940) 0.09045            |
| Smoking                                    | 1.122 (0.894, 1.408) 0.32008          |                                         |
| Dyspnea (vs. none)                         |                                       |                                         |
| Moderate exertion                          | 2.333 (1.645, 3.309) <0.00001         | 1.190 (0.805, 1.759) 0.38300            |
| At rest                                    | 2.495 (0.906, 6.875) 0.07697          | 0.821 (0.278, 2.424) 0.72081            |
| Functional health status (vs. independent) |                                       |                                         |
| Partially dependent                        | 4.032 (3.013, 5.396) <0.00001         | 2.152 (1.561, 2.965) <0.00001           |
| Totally dependent                          | 7.211 (3.981, 13.064) <0.00001        | 2.982 (1.529, 5.817) 0.00135            |
| Ventilator-dependent                       | 4.527 (2.856, 7.175) <0.00001         | 2.402 (1.410, 4.095) 0.00127            |
| Severe COPD                                | 2.525 (1.851, 3.442) <0.00001         | 1.167 (0.821, 1.658) 0.38880            |
| CHF                                        | 7.270 (3.553, 14.873) <0.00001        | 2.137 (0.952, 4.798) 0.06582            |
| Hypertension                               | 2.292 (1.899, 2.766) <0.00001         | 1.374 (1.105, 1.709) 0.00426            |
| Renal failure                              | 10.893 (3.029, 39.178) 0.00026        | 2.601 (0.607, 11.145) 0.19797           |
| Dialysis                                   | 6.580 (3.098, 13.974) <0.00001        | 2.774 (0.841, 9.158) 0.09396            |
| Disseminated cancer                        | 2.913 (2.414, 3.516) <0.00001         | 1.791 (1.450, 2.213) <0.00001           |
| Open wound infection                       | 5.041 (3.019, 8.416) <0.00001         | 2.297 (1.282, 4.118) 0.00522            |
| Steroid use for chronic condition          | 2.330 (1.895, 2.865) <0.00001         | 1.619 (1.292, 2.028) 0.00003            |
| >10% loss body weight in last 6 months     | 4.255 (2.994, 6.047) <0.00001         | 2.067 (1.391, 3.072) 0.00032            |
| Bleeding disorders                         | 2.307 (1.456, 3.655) 0.00037          | 0.983 (0.590, 1.639) 0.94823            |
| Preop transfusions                         | 5.860 (2.775, 12.375) <0.00001        | 1.282 (0.510, 3.223) 0.59712            |
| Pre-operation systemic sepsis (vs.         |                                       |                                         |

|                                         |                                   |                               |
|-----------------------------------------|-----------------------------------|-------------------------------|
| none)                                   |                                   |                               |
| SIRS                                    | 2.186 (1.504, 3.177) 0.00004      | 1.224 (0.819, 1.830) 0.32397  |
| Sepsis                                  | 13.470 (6.040, 30.040) <0.00001   | 3.563 (1.349, 9.408) 0.01033  |
| Septic shock                            | 9.354 (2.015, 43.428) 0.00431     | 1.536 (0.283, 8.337) 0.61891  |
| Na, mmol/l                              | 0.910 (0.886, 0.934) <0.00001     | 0.971 (0.945, 0.997) 0.03077  |
| BUN, mg/dl                              | 1.043 (1.036, 1.050) <0.00001     | 1.019 (1.009, 1.029) 0.00029  |
| Cr, mg/dl                               | 1.240 (1.112, 1.383) 0.00011      | 0.781 (0.589, 1.034) 0.08423  |
| WBC, $\times 10^9/l$                    | 1.074 (1.057, 1.091) <0.00001     | 1.049 (1.029, 1.068) <0.00001 |
| HCT, %                                  | 0.923 (0.908, 0.939) <0.00001     | 0.959 (0.941, 0.978) 0.00002  |
| PLT, $\times 10^9/l$                    | 0.998 (0.997, 0.999) 0.00238      | 0.998 (0.997, 1.000) 0.01114  |
| Emergency case                          | 2.875 (2.223, 3.719) <0.00001     | 2.267 (1.707, 3.011) <0.00001 |
| Wound classification (vs. clean         |                                   |                               |
| Clean/contaminated                      | 0.549 (0.175, 1.722) 0.30411      | 0.560 (0.173, 1.809) 0.33261  |
| Contaminated                            | 0.713 (0.264, 1.924) 0.50406      | 0.647 (0.236, 1.774) 0.39781  |
| Dirty/infected                          | 5.506 (2.613, 11.600) <0.00001    | 3.228 (1.369, 7.609) 0.00740  |
| ASA classification (vs. no disturbance) |                                   |                               |
| Mild disturbance                        | 257363.290 (0.000, inf.) 0.96005  |                               |
| Severe disturbance                      | 1010340.670 (0.000, inf.) 0.95567 |                               |
| Life threat                             | 3095167.281 (0.000, inf.) 0.95209 |                               |
| Moribund                                | 5005272.255 (0.000, inf.) 0.95055 |                               |

For any of the continuous variables, there were stepwise increments. OR, odds ratio; inf., infinite; WBC, white blood cells; BUN, blood urea nitrogen; HCT, hematocrit; Cr, creatinine; BMI, body mass index; Na, blood sodium; PLT, platelets; COPD, chronic obstructive pulmonary disease; CHF, congestive heart failure; SIRS, systemic inflammatory response syndrome; ASA, American Society of Anesthesiologists.

**Table SIII.** Prediction performance of categorical risk predictors in our nomogram (training cohort).

| Parameter                | LR     | Sensitivity | Specificity | PPV    | NPV    | Accuracy | PLR    | NLR    | DOR    |
|--------------------------|--------|-------------|-------------|--------|--------|----------|--------|--------|--------|
| Age, years               |        | 0.6703      | 0.5861      | 0.0379 | 0.9865 | 0.5881   | 1.6193 | 0.5626 | 2.8783 |
| 18-40                    | 0.2649 |             |             |        |        |          |        |        |        |
| 41-60                    | 0.6775 |             |             |        |        |          |        |        |        |
| 61-80                    | 1.3792 |             |             |        |        |          |        |        |        |
| >81                      | 4.3244 |             |             |        |        |          |        |        |        |
| Functional health status |        | 0.1838      | 0.9548      | 0.0899 | 0.9797 | 0.9365   | 4.0684 | 0.8548 | 4.7592 |
| Independent              | 0.8548 |             |             |        |        |          |        |        |        |
| Partially dependent      | 4.1025 |             |             |        |        |          |        |        |        |
| Totally dependent        | 3.8290 |             |             |        |        |          |        |        |        |
| Disseminated cancer      |        | 0.4919      | 0.7992      | 0.0562 | 0.9848 | 0.7919   | 2.4498 | 0.6358 | 3.8533 |
| No                       | 2.4498 |             |             |        |        |          |        |        |        |
| Yes                      | 0.6358 |             |             |        |        |          |        |        |        |

NPV, negative predictive value; PPV, positive predictive value; LR, likelihood ratio; DOR, diagnostic odds ratio.

**Table SIV.** Predictive performance of continuous risk predictors in our nomogram.

| <b>Parameter</b>           | <b>Best<br/>threshold</b> | <b>Specificity</b> | <b>Sensitivity</b> | <b>Accuracy</b> | <b>PLR</b> | <b>NLR</b> | <b>DOR</b> | <b>PPV</b> | <b>NPV</b> |
|----------------------------|---------------------------|--------------------|--------------------|-----------------|------------|------------|------------|------------|------------|
| BUN,<br>mg/dl              | 18.9834                   | 0.6552             | 0.5946             | 0.6537          | 1.7242     | 0.6188     | 2.7864     | 0.0402     | 0.9852     |
| WBC<br>( $\times 10^9/l$ ) | 12.2900                   | 0.7916             | 0.4054             | 0.7824          | 1.9453     | 0.7511     | 2.5898     | 0.0451     | 0.9821     |
| HCT, %                     | 36.9488                   | 0.7949             | 0.4054             | 0.7856          | 1.9764     | 0.7480     | 2.6422     | 0.0458     | 0.9822     |

The above values presented refer to an ROC curve. PPV, positive predictive value; NPV, negative predictive value; PLR, positive likelihood ratio; NLR, negative likelihood ratio; DOR, diagnostic odds ratio; BUN, blood urea nitrogen; WBC, white blood cells; HCT, hematocrit.

**Table SV.** ROC curve analysis for continuous predictors and best threshold analysis.

| Parameter        | Training datasets-score | Validation datasets-score |
|------------------|-------------------------|---------------------------|
| 30-day mortality |                         |                           |
| No               | 7615                    | 10569                     |
| Yes              | 185                     | 273                       |
| AUC              | 0.7844                  | 0.7289                    |
| 95%CI            | 0.7526-0.8162           | 0.7012-0.7566             |
| Best threshold   | 2.2500                  | 1.7500                    |
| Specificity      | 0.7354                  | 0.6549                    |
| Sensitivity      | 0.7514                  | 0.6850                    |
| Accuracy         | 0.7358                  | 0.6557                    |
| PLR              | 2.8395                  | 1.9851                    |
| NLR              | 0.3381                  | 0.4810                    |
| PPV              | 0.0645                  | 0.0488                    |
| NPV              | 0.9919                  | 0.9877                    |

AUC, area under the ROC curve; ROC, receiver operating characteristic; CI, confidence interval; PPV, positive predictive value; NPV, negative predictive value; PLR, positive likelihood ratio; NLR, negative likelihood ratio.