

Supplementary Table 6. Multivariate logistic regression analyses for prolonged ED length of stay longer than 18 hours

| Variable | Univariate analysis | | Multivariate analysis | |
|--|-----------------------|---------|-----------------------|---------|
| | OR | P-value | aOR | P-value |
| Age group | | | | |
| Pediatric (0–19 yr) | 0.341 (0.336–0.346) | <0.001 | 0.417 (0.409–0.425) | <0.001 |
| Adult (20–64 yr) | Reference | - | Reference | - |
| Elderly (≥65 yr) | 2.624 (2.606–2.642) | <0.001 | 1.326 (1.316–1.336) | <0.001 |
| Sex | | | | |
| Male | 1.194 (1.186 – 1.201) | <0.001 | 1.137 (1.129–1.144) | <0.001 |
| Female | Reference | - | Reference | - |
| Geographic location | | | | |
| Metropolitan area | Reference | - | Reference | - |
| Gangwon-do | 0.589 (0.575–0.603) | <0.001 | 0.460 (0.449–0.472) | <0.001 |
| Chungcheongnam-do | 0.492 (0.484–0.501) | <0.001 | 0.478 (0.470–0.487) | <0.001 |
| Chungcheongbuk-do | 0.479 (0.464–0.494) | <0.001 | 0.477 (0.462–0.492) | <0.001 |
| Gyeongsangbuk-do | 2.341 (2.320–2.362) | <0.001 | 1.949 (1.930–1.968) | <0.001 |
| Gyeongsangnam-do | 1.684 (1.668–1.701) | <0.001 | 1.325 (1.312–1.338) | <0.001 |
| Jeollabuk-do | 2.277 (2.250–2.304) | <0.001 | 2.002 (1.977–2.028) | <0.001 |
| Jeollanam-do | 1.400 (1.381–1.420) | <0.001 | 1.029 (1.014–1.044) | <0.001 |
| Jeju Island | 0.275 (0.264–0.286) | <0.001 | 0.364 (0.350–0.379) | <0.001 |
| Insurance type | | | | |
| National health insurance | Reference | - | 1.000 | - |
| Automobile Insurance | 0.330 (0.320–0.340) | <0.001 | 0.384 (0.372–0.397) | <0.001 |
| Medical aid | 1.887 (1.868–1.907) | <0.001 | 1.251 (1.237–1.265) | <0.001 |
| Other (including private insurance) | 0.581 (0.564–0.598) | <0.001 | 0.731 (0.709–0.754) | <0.001 |
| ED type | | | | |
| Level I | Reference | - | Reference | - |
| Level II | 0.680 (0.675–0.684) | <0.001 | 0.966 (0.959–0.972) | <0.001 |
| Arrival route | | | | |
| Direct visit | Reference | - | Reference | - |
| Transfer | 4.620 (4.587–4.653) | <0.001 | 1.544 (1.531–1.558) | <0.001 |
| Referral from outpatient | 6.695 (6.614–6.777) | <0.001 | 2.480 (2.445–2.514) | <0.001 |
| Other | 2.380 (2.004–2.827) | <0.001 | 1.486 (1.241–1.780) | <0.001 |
| Means of arrival | | | | |
| On foot | Reference | - | Reference | - |
| Emergency medical services (119 ambulance) | 0.948 (0.920–0.977) | <0.001 | 0.979 (0.947–1.011) | <0.001 |
| Other vehicles | 0.686 (0.666–0.707) | <0.001 | 1.001 (0.970–1.034) | <0.001 |
| Other | 2.591 (2.436–2.755) | <0.001 | 1.351 (1.266–1.443) | <0.001 |
| Admission season | | | | |
| Spring (March–May) | Reference | - | Reference | - |
| Summer (June–August) | 0.884 (0.877–0.892) | <0.001 | 0.908 (0.900–0.917) | <0.001 |
| Fall (September–November) | 0.852 (0.844–0.859) | <0.001 | 0.862 (0.854–0.870) | <0.001 |
| Winter (December–February) | 0.924 (0.915–0.932) | <0.001 | 0.969 (0.960–0.978) | <0.001 |
| Admission time | | | | |
| Morning (08:00–15: 59) | 4.141 (4.079–4.204) | <0.001 | 2.279 (2.243–2.314) | <0.001 |
| Evening (16:00–23:59) | 5.262 (5.184–5.340) | <0.001 | 4.979 (4.905–5.055) | <0.001 |
| Night (00:00–07:59) | Reference | - | Reference | - |

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|----------------------------------|---------------------|--------|---------------------|--------|
| Emergency symptom | 6.610 (6.503–6.719) | <0.001 | 1.867 (1.835–1.899) | <0.001 |
| KTAS | | | | |
| Level 1 | 1.600 (1.567–1.633) | <0.001 | 1.103 (1.074–1.133) | <0.001 |
| Level 2 | 1.668 (1.652–1.684) | <0.001 | 1.115 (1.103–1.127) | <0.001 |
| Level 3 | Reference | - | Reference | - |
| Level 4 | 0.258 (0.256–0.260) | <0.001 | 0.686 (0.679–0.692) | <0.001 |
| Level 5 | 0.105 (0.103–0.108) | <0.001 | 0.439 (0.428–0.450) | <0.001 |
| Initial level of consciousness | | | | |
| Alert | Reference | - | Reference | - |
| Verbal | 4.048 (3.991–4.104) | <0.001 | 1.457 (1.434–1.479) | <0.001 |
| Pain response | 4.238 (4.169–4.309) | <0.001 | 1.449 (1.421–1.477) | <0.001 |
| Unresponsive | 1.574 (1.521–1.630) | <0.001 | 0.740 (0.706–0.775) | <0.001 |
| Initial systolic blood pressure | | | | |
| Normal | Reference | - | Reference | - |
| Abnormal | 0.608 (0.604–0.612) | <0.001 | 0.809 (0.803–0.816) | <0.001 |
| Other | 0.219 (0.215–0.222) | <0.001 | 0.533 (0.480–0.591) | <0.001 |
| Initial diastolic blood pressure | | | | |
| Normal | Reference | - | Reference | - |
| Abnormal | 0.727 (0.722–0.732) | <0.001 | 1.015 (1.007–1.023) | <0.001 |
| Other | 0.254 (0.250–0.258) | <0.001 | 1.383 (1.250–1.529) | <0.001 |
| Initial heart rate | | | | |
| Normal | Reference | - | Reference | - |
| Abnormal | 1.842 (1.829–1.855) | <0.001 | 1.280 (1.270–1.289) | <0.001 |
| Other | 0.422 (0.413–0.431) | <0.001 | 1.658 (1.560–1.761) | <0.001 |
| Initial body temperature | | | | |
| Normal | Reference | - | Reference | - |
| Abnormal | 1.273 (1.265–1.281) | <0.001 | 1.106 (1.099–1.114) | <0.001 |
| Other | 0.578 (0.555–0.603) | <0.001 | 0.753 (0.717–0.791) | <0.001 |
| Initial respiratory rate | | | | |
| Normal | Reference | - | Reference | - |
| Abnormal | 1.786 (1.770–1.802) | <0.001 | 1.101 (1.090–1.112) | <0.001 |
| Other | 0.400 (0.392–0.409) | <0.001 | 1.143 (1.080–1.210) | <0.001 |
| Initial SpO ₂ | | | | |
| Normal | Reference | - | Reference | - |
| Abnormal | 2.968 (2.918–3.018) | <0.001 | 0.969 (0.951–0.987) | <0.001 |
| Other | 0.250 (0.247–0.252) | <0.001 | 0.510 (0.506–0.515) | <0.001 |
| Myocardial infarction | | | | |
| Diagnosed | 3.426 (3.352–3.503) | <0.001 | 0.998 (0.975–1.022) | <0.001 |
| Excluded | Reference | - | Reference | - |
| Cerebral infarction | | | | |
| Diagnosed | 2.528 (2.487–2.570) | <0.001 | 0.678 (0.666–0.690) | <0.001 |
| Excluded | Reference | - | Reference | - |
| Sepsis | | | | |
| Diagnosed | 4.779 (4.685–4.875) | <0.001 | 1.142 (1.118–1.167) | <0.001 |
| Excluded | Reference | - | Reference | - |
| Intracranial hemorrhage | | | | |
| Diagnosed | 1.696 (1.642–1.751) | <0.001 | 0.520 (0.502–0.538) | <0.001 |
| Excluded | Reference | - | Reference | - |
| Severe illness (28 diseases) | | | | |
| Diagnosed | 4.221 (4.193–4.249) | <0.001 | 1.064 (1.055–1.073) | <0.001 |
| Excluded | Reference | - | Reference | - |
| ED outcome | | | | |

| | | | | |
|------------------------------|------------------------|--------|------------------------|--------|
| Discharge | Reference | - | Reference | - |
| Transfer to another hospital | 21.999 (21.700–22.302) | <0.001 | 10.295 (10.143–10.449) | <0.001 |
| General ward admission | 15.510 (15.381–15.641) | <0.001 | 7.537 (7.187–7.905) | <0.001 |
| ICU admission | 9.450 (9.323–9.579) | <0.001 | 3.079 (2.931–3.235) | <0.001 |
| Death | 7.310 (7.044–7.587) | <0.001 | 3.675 (3.513–3.845) | <0.001 |
| Hospital outcome | | | | |
| Discharge | Reference | - | Reference | - |
| Transfer to another hospital | 1.086 (1.072–1.100) | <0.001 | 0.908 (0.895–0.920) | <0.001 |
| Death | 1.472 (1.450–1.495) | <0.001 | 1.159 (1.140–1.178) | <0.001 |
| Other | 1.048 (0.979–1.121) | <0.001 | 0.829 (0.773–0.888) | <0.001 |

ED, emergency department; OR, odds ratio; CI, confidence interval; aOR, adjusted odds ratio; KTAS, Korean Triage and Acuity Scale; SpO₂, oxygen saturation as measured by pulse oximetry; ICU, intensive care unit.