

## Supplementary Material S3: summary of studies

**Table S1:** Summary of studies included in narrative

| Study synthesis         | Study population  | Design and analysis method                                    | No. of people in final model (PI%), no. PI dev. and stage/grade outcome | No. of risk factors (no. of sig. factors), model risk factor names | p value | Odds ratio (OR)/Hazard Ratio (HR) | 95% Confidence interval | Risk of bias |
|-------------------------|---|---|---|--|---------|-----------------------------------|-------------------------|--------------|
| Aghazadeh et al. (2020) | 200 pts<br>Setting: acute care hospital                                 | Prospective cohort study<br><br>Logistic regression           | 200 (19.5%), 39<br>Stage $\geq 1$                                       | NR (3)   |         | OR                                |                         | High         |
|                         |   |   |   | Total Braden score   | .03     | 0.37                              | 0.15-0.94               |              |
|                         |   |   |   | Length of Hospitalization (days)                                   | .01     | 1.48                              | 1.09-2.01               |              |
|                         |   |   |   | Weight (kg)  | .01     | 1.48                              | 1.01-2.01               |              |
| Allman et al. (1995)    | 286 pts.<br>Setting: tertiary care, urban, university teaching hospital | Prospective cohort study<br><br>Cox proportional hazard model | 286 (12.9%), 37<br>Stage $\geq 2$                                       | 9 (5)  |         | HR                                |                         | Moderate     |
|                         |   |   |   | Non-blanchable erythema of intact sacral skin                      | .05     | 7.52                              | 1.00-59.1               |              |
|                         |   |   |   | Lymphopenia  | .003    | 4.82                              | 1.70-13.89              |              |
|                         |   |   |   | Immobility   | .02     | 2.36                              | 1.14-4.85               |              |
|                         |   |   |   | Dry sacral skin  | .04     | 2.31                              | 1.02-5.21               |              |
|                         |   |   |   | Decreased body weight  | .03     | 2.18                              | 1.05-4.52               |              |
| Aloweni et al. (2019)   | 269 pts (surgical)<br>Setting: acute care hospital                      | Retrospective record review<br><br>Logistic regression        | 269 (28%), 80<br>Stage $\geq 1$   | 13 (8)   |         | OR                                |                         | Moderate     |
|                         |   |   |   | Age $\geq 75$ years  | NR      | 2.75                              | 1.35-5.58               |              |
|                         |   |   |   | Female   | NR      | 1.94                              | 0.99-3.8                |              |
|                         |   |   |   | ASA grade $\geq 3$   | NR      | 3.12                              | 1.51-6.44               |              |
|                         |   |   |   | BMI $< 23$   | NR      | 2.30                              | 1.16-4.56               |              |
|                         |   |   |   | Preoperative Braden score $\leq 14$                                | NR      | 3.89                              | 1.49-10.14              |              |
|                         |   |   |   | Anemia   | NR      | 5.17                              | 1.43-18.69              |              |
|                         |   |   |   | Respiratory disease  | NR      | 6.36                              | 1.67-24.25              |              |
|                         |   |   |   | Hypertension   | NR      | 2.36                              | 1.18-4.75               |              |
| Anrys et al. (2018)     | 308 pts<br>Setting: nursing home  | Prospective cohort study<br><br>Logistic regression           | 308 (8.4%), 26<br>Stage $\geq 2$  | 9 (3)  |         | OR                                |                         | Moderate     |
|                         |   |   |   | Pressure area-related pain   | .038    | 2.91                              | 1.06-7.98               |              |
|                         |   |   |   | Non-blanchable erythema at baseline                                | .006    | 4.06                              | 1.5-11.00               |              |
|                         |   |   |   | Total Braden score   | .031    | 0.81                              | 0.67-0.98               |              |
| Artico et al. (2020)    | 992 pts<br>Setting: residential hospice                                 | Prospective cohort study                                      | 992 (26.5%), 263<br>Stage $\geq 1$                                      | 16 (6)   |         | OR                                |                         | Low          |
|                         |   |   |   | Braden score (at risk vs. not at risk)<br>ESASr                    | $<.001$ | 3.14                              | 1.87-5.27               |              |

|                             |  |                               |  |   |   |  |   |          |
|-----------------------------|--|-------------------------------|--|---|---|--|---|----------|
|                             |  | Logistic regression           |  | Feeling sleepy<br>Pain<br>Shortness of breath<br>Primary diagnosis cancer (vs. other diagnoses)<br>Urinary catheter   | .001<br>.007<br>.016<br>.004<br>.015  | 1.51<br>1.48<br>1.44<br>1.57<br>1.48                                       | 1.17-1.93<br>1.17-3.14<br>1.07-1.94<br>1.16-3.14<br>1.08-2.03   |          |
| Baumgarten et al. (2004)    | 2285 pts<br>Setting: nursing home                  | Prospective cohort study      | 1938 (23.3%), 450<br>Stage ≥ 2                                 | 14 (3)  |   | HR   |   | Moderate |
|                             |  | Cox proportional hazard model |  | Black race<br>No. of activities of daily living dependencies<br>PI on admission   | .032<br><.001<br><.001  | 1.31<br>1.38<br>1.80   | 1.02-1.66<br>1.25-1.53<br>1.40-2.32   |          |
| Bergquist and Frantz (1999) | 1711 pts<br>Setting: urban home health care agency | Retrospective record review   | 1567 (3.5%), 55<br>Stage ≥ 2                                   | 45 (10)   |   | HR   |   | Moderate |
|                             |  | Cox proportional hazard model |  | Limitation in activity to wheelchair<br>ADL dressing<br>Bowel/bladder incontinence<br>Braden scale mobility<br>Anemia<br>Adult child as primary caregiver<br>Male<br>Recent fracture<br>Oxygen use<br>Skin drainage | .02<br><.001<br>.02<br><.001<br>.002<br><.001<br>.028<br>.002<br><.001<br><.001 | 2.77<br>2.71<br>2.85<br>5.2<br>3.96<br>5.82<br>1.86<br>3.46<br>3.95<br>6.6 | 1.18-6.51<br>1.54-4.78<br>1.18-6.84<br>2.44-11.08<br>1.65-9.53<br>2.13-15.86<br>1.07-3.24<br>1.58-7.58<br>2.06-7.57<br>2.27-19.19 |          |
| Bergstrom and Braden (1992) | 200 pts.<br>Setting: nursing home                  | Prospective cohort study      | 200 (73.5%), 147 stage ≥ 1;<br>(38.5%), 77 stage ≥ 2           | Model 1: 10 (3)   |   | OR <sup>a</sup>  |   | Moderate |
|                             |  | Logistic regression           | Model 1: Stage ≥ 1<br>Model 2: Stage ≥ 2<br>Model 3: Stage = 1 | Braden scale<br>Diastolic blood pressure<br>Protein (%RDA)  | <.01<br><.01<br><.05  | 0.69<br>0.95<br>1.01   | NR<br>NR<br>NR  |          |
|                             |  |                               |  | Model 2: 10 (3)   |   |  |   |          |
|                             |  |                               |  | Braden scale<br>Age<br>Systolic blood pressure  | <.001<br><.05<br><.01   | 0.66<br>1.07<br>0.97   | NR<br>NR<br>NR  |          |
|                             |  |                               |  | Model 3: 10 (4)   |   |  |   |          |
|                             |  |                               |  | Braden scale<br>Diastolic blood pressure<br>Temperature (°F)<br>Iron (%RDA)   | <.01<br><.01<br><.05<br><.01  | 0.65<br>0.90<br>1.70<br>0.98   | NR<br>NR<br>NR<br>NR  |          |

|                                   |   |                               |   |   |       |      |           |          |
|-----------------------------------|---|-------------------------------|---|---|-------|------|-----------|----------|
| Bergstrom et al. (1996)           | 843 pts.<br>Setting: multiple                           | Prospective cohort study      | 843 (12.8%), 108<br>Stage $\geq 1$                            | <i>Model 1: 6 (3)</i>                         |       | OR   |           | Low      |
|                                   |   | Logistic regression           | Model 1: Preventive measures, age, gender, race, Braden scale | Braden scale                                  | <.001 | 1.30 | 1.19-1.41 |          |
|                                   |   |                               |   | Age   | <.001 | 0.97 | 0.95-0.98 |          |
|                                   |   |                               |   | Race  | .012  | 2.73 | 1.25-5.98 |          |
|                                   |   |                               |   | <i>Model 2: 15 (3)</i>                        |       |      |           |          |
|                                   |   |                               |   | Braden scale mobility                         | <.001 | 1.72 | 1.27-2.33 |          |
|                                   |   |                               |   | Braden scale activity                         | .004  | 1.46 | 1.13-1.88 |          |
| Bourdell-Marchasson et al. (2000) | 672 pts.<br>Setting: hospital wards and geriatric units | RCT                           | 672 (44.5%), 299<br>Stage $\geq 1$                            | NR (5)  |       | HR   |           | Moderate |
|                                   |   | Cox proportional hazard model |   | Control group vs. intervention group          | .04   | 1.57 | 1.03-2.38 |          |
|                                   |   |                               |   | Norton score 5-10 vs. >14                     | .04   | 1.28 | 1.01-1.62 |          |
|                                   |   |                               |   | Kuntzmann score                               | .003  | 1.22 | 0.32-4.58 |          |
|                                   |   |                               |   | Serum albumin (1 g/L decrease)                | <.001 | 1.05 | 1.02-1.07 |          |
|                                   |   |                               |   | Lower limb fracture                           | <.001 | 2.68 | 1.75-4.11 |          |
|                                   |   |                               |   |   |       |      |           |          |
| Boyle and Green (2001)            | 534 pts.<br>Setting: ICU                                | Prospective cohort study      | 534 (5.2%), 28<br>Stage $\geq 1$                              | 2 (2)   |       | HR   |           | Moderate |
|                                   |   | Weibull regression            |   | Coma/unresponsiveness/paralyzed & sedated     | .001  | 4.2  | 30-77     |          |
|                                   |   |                               |   | Cardiovascular instability                    | .036  | 2.7  | 4-70      |          |
| Brandeis et al. (1994)            | 4232 pts.<br>Setting: nursing homes                     | Prospective cohort study      | 4232 (12.9%), 546<br>Stage $\geq 2$                           | <i>Model 1: 10 (4)</i>                        |       | OR   |           | Low      |
|                                   |   | Logistic regression           | Model 1: high incidence homes<br>1322 (19.3%), 255            | Ambulation difficulty                         | <.001 | 3.3  | 2.0-5.3   |          |
|                                   |   |                               |   | Fecal incontinence                            | <.001 | 2.5  | 1.6-4.0   |          |
|                                   |   |                               |   | Diabetes mellitus                             | <.006 | 1.7  | 1.2-2.5   |          |
|                                   |   |                               |   | Feeding ADL                                   | <.001 | 2.2  | 1.5-3.3   |          |
|                                   |   |                               | Model 2: low incidence homes<br>1365 (6.5%), 89               | <i>Model 2: 7 (3)</i>                         |       |      |           |          |
|                                   |   |                               |   | Ambulation difficulty                         | <.001 | 3.6  | 1.7-7.4   |          |
| Chan et al. (2005)                | 666 pts.<br>Setting: hospital wards                     | Prospective cohort study      | 666 (8.1%), 51<br>Stage $\geq 1$                              | 23 (2)  |       | OR   |           | Moderate |
|                                   |   | Logistic regression           |   | Braden scale (12-15) vs. Braden scale (16-23) | <.001 | 7.7  | 3.5-17.1  |          |
|                                   |   |                               |   |   |       |      |           |          |

|                       |                                 |  |   |   |   |  |  |          |
|-----------------------|---------------------------------|--|---|---|---|--|--|----------|
|                       |                                 |  |   | Braden scale (6-11) vs. Braden scale (16-23)  | <.001   | 12.5   | 4.5-34.6   |          |
| Chen et al. (2018)    | 2570 pts<br>Setting: nationwide | Retrospective record review<br><br>Cox Proportional Hazard Model | 2570 (2.1%), 53<br>Stage not specified (ICD-9-CM codes 707.0)                                 | 12 (4)<br><br>ALS<br>Age<br>Stroke<br>Spinal cord injury  | <br><br><.001<br><.001<br><.05<br><.05  | HR<br><br>8.82<br>1.06<br>2.3<br>4.1   | <br><br>4.9-15.9<br>1.03-1.09<br>1.05-5.07<br>1.23-13.7  | High     |
| Compton et al. (2008) | 713 pts.<br>Setting: ICU        | Retrospective record review<br><br>Logistic regression           | 698 (17%), 121<br>Stage ≥ 2   | 32 (6)<br><br>Male gender<br>Moist skin<br>Edematous skin<br>Centralized circulation<br>Mottled skin<br>Reddened skin   | <br><br>.014<br>.001<br>.002<br>.001<br>.016<br>.001  | OR<br><br>1.81<br>2.35<br>2.25<br>2.4<br>2.02<br>2.31  | <br><br>NR<br>NR<br>NR<br>NR<br>NR   | Moderate |
| Cox (2011)            | 347 pts.<br>Setting: ICU        | Retrospective record review<br><br>Logistic regression           | 347<br><br>Model 1: 347 (18.7%), 65<br>Stage ≥ 1<br><br>Model 2: 327 (13.8%), 45<br>Stage ≥ 2 | Model 1: 15 (4)<br><br>Age<br>Hours in ICU<br>Cardiovascular disease<br>Braden scale mobility<br><br>Model 2: 15 (4)<br><br>Hours in ICU<br>Cardiovascular disease<br>Braden scale friction/shear<br>Norepinephrine   | <br><br>.03<br><.001<br>.007<br>.04<br><br><.001<br>.02<br>.01<br>.04                                     | OR<br><br>1.03<br>1.01<br>2.95<br>0.44<br><br>1.01<br>3.38<br>5.72<br>1.02                             | <br><br>1.01-1.06<br>1.01-.1.01<br>1.3-6.4<br>0.21-0.95<br><br>1.01-1.01<br>1.22-9.35<br>1.42-22.95<br>1.01-1.03   | Low      |
| Cox et al. (2020)     | 1460 pts.<br>Setting: ICU       | Retrospective Record Review<br><br>Logistic regression           | 1460 (25%), 365<br>Stage ≥ 1  | 13 (12)<br><br>Female<br>Age<br>Cardiovascular disease<br>Peripheral vascular disease<br>Hypotension<br>Moderate to severe malnutrition<br>Septic shock<br>Pneumonia or influenza<br>Cardiovascular surgery<br>Hemodialysis<br>Norepinephrine<br>Braden scale score | <br><br>.02<br><.001<br>.03<br><.001<br><.001<br><.001<br><.001<br>.004<br><.001<br>.01<br><.001<br><.001 | OR<br><br>0.71<br>1.02<br>1.50<br>2.30<br>1.90<br>2.08<br>1.75<br>1.58<br>2.53<br>1.66<br>3.02<br>0.84 | <br><br>0.54-0.94<br>1.01-1.03<br>1.04-2.16<br>1.43-3.71<br>1.37-2.65<br>1.43-3.03<br>1.29-2.38<br>1.16-2.15<br>1.54-4.13<br>1.12-2.46<br>2.16-4.22<br>0.79-0.89 | Low      |

|                              |   |   |   |   |   |  |   |          |
|------------------------------|---|---|---|---|---|--|---|----------|
| Defloor and Grypdonck (2005) | 1772 pts.<br>Setting: long-term care facilities                               | RCT<br><br>Logistic regression                                | 1458<br><br>Model 1: 1458 (20.7%), 302 Stage ≥ 1<br><br>Model 2: 1458 (11.7%), 171 Stage ≥ 2  | Model 1: 19 (3)<br><br>Braden scale sensory perception<br>Skin condition<br>Existing PIs<br><br>Model 2: 19 (4)<br><br>Braden scale activity<br>Braden scale sensory perception<br>Skin condition<br>Existing PIs | <br><br>.02<br><.001<br><.001<br><br>.03<br>.02<br><.001<br>.01 | OR<br><br>0.76<br>1.49<br>2.25<br><br>0.67<br>0.73<br>1.63<br>1.85 | 0.61-0.96<br>1.21-1.85<br>1.43-3.54<br><br>0.47-0.96<br>0.55-0.95<br>1.25-2.12<br>1.13-3.04 | Low      |
| de Laat et al. (2007)        | 399 pts.<br>Setting: ICU  | Prospective cohort study<br><br>Cox proportional hazard model | 399 (35.1%), 140 Stage ≥ 2  | 11 (3)<br><br>Preventive transfers to specific mattresses<br>Shock or resuscitation<br>Friction and shear present   | <br><br><.001<br><.001<br>.02                                   | HR<br><br>0.22<br>1.5<br>1.3                                       | NR<br>NR<br>NR  | Moderate |
| Donnelly et al. (2011)       | 239 pts<br>Setting: fracture trauma unit                                      | RCT<br><br>Cox proportional hazard model                      | 239 (16.3%), 39 Stage ≥ 1   | NR (1)<br><br>Treatment group   | <br><br>NR  | HR<br><br>0.21   | 0.08-0.54   | Moderate |
| Dukes et al. (2018)          | 282 pts<br>Setting: patients overseen by the Critical Care Air Transport Team | Retrospective record review<br><br>Logistic regression        | 205<br>Stage not specified  | 16 (2)<br><br>BMI<br>Multiple transports (≥ 2 vs. 1)  | <br><br><.001<br><.001  | OR<br><br>1.16<br>27.62  | 1.04-1.29<br>10.24-74.48  | High     |
| Ek (1987)                    | 515 pts.<br>Setting: long-term medical ward                                   | Prospective cohort study<br><br>Logistic regression           | 515 (7.6%), 39 Stage ≥ 1 equivalent<br><br>Model 1: baseline measure<br><br>Model 2: variables on day of PI or if PI free on 4 <sup>th</sup> week of care | Model 1: 10 (1)<br><br>Norton scale mobility<br><br>Model 2: 10 (2)<br>General physical condition<br>Norton scale activity  | <br><br><.05<br><br><.01<br><.01                                | OR<br><br>NR<br><br>NR<br>NR                                       | NR<br>NR<br>NR<br>NR  | High     |
| Ek et al. (1991)             | 501 pts.<br>Setting: long-term medical ward                                   | RCT<br><br>Multiple regression                                | 495 (10.1%), 51 Stage ≥ 1 equivalent  | NR (4)<br><br>Albumin<br>Norton scale mobility<br>Norton scale activity<br>Food intake  | <br><br><.001<br><.001<br><.05<br><.05                          | NR<br>NR<br>NR<br>NR   | NR<br>NR<br>NR<br>NR  | High     |

|                               |   |                               |                                      |   |       |       |            |          |
|-------------------------------|---|-------------------------------|--------------------------------------|---|-------|-------|------------|----------|
| Forni et al. (2018)           | 359 pts<br>Setting: university orthopedic hospital  | RCT                           | 359 (10%), 36<br>Stage $\geq 1$      | Model 1: 2 (2)                          |       | OR    |            | Moderate |
|                               |   | Logistic regression           | Model 1: logistic regression         | Male gender                             | .035  | 2.28  | 1.06-4.91  |          |
|                               |   |                               |                                      | Control vs intervention                 | .001  | 3.84  | 1.69-8.72  |          |
|                               |   | Cox proportional hazard model | Model 2: cox regression              | Model 2: NR (1)                         |       | HR    |            |          |
| Galivanch e et al. (2020)     | 8871 pts<br>Setting: multiple hospitals             | Retrospective record review   | 8871 (5.2%), 457<br>Stage $\geq 1$   | Model 1: 17 (4)                         |       | OR    |            | Low      |
|                               |   | Logistic regression           | Model 1: preoperative comorbidities  | Preoperative sepsis                     | .001  | 4.04  | 1.14-14.37 |          |
|                               |   |                               |                                      | High preoperative platelet count (>417) | .001  | 2.78  | 1.14-6.73  |          |
|                               |   |                               |                                      | Insulin-dependent diabetes              | <.001 | 2.32  | 1.39-3.86  |          |
|                               |   |                               |                                      | Preoperative PI                         | <.001 | 2.26  | 1.23-4.17  |          |
|                               |   |                               | Model 2: postoperative complications | Model 2: 12 (4)                         |       |       |            |          |
|                               |   |                               |                                      | Postoperative sepsis                    | .001  | 2.63  | 1.15-6.00  |          |
|                               |   |                               |                                      | Postoperative pneumonia                 | <.001 | 2.47  | 1.42-4.28  |          |
|                               |   |                               |                                      | Urinary tract infection                 | .001  | 2.04  | 1.12-3.71  |          |
|                               |   |                               |                                      | Postoperative delirium                  | <.001 | 2.03  | 1.45-2.84  |          |
| Gao et al. (2018)             | 1963 pts (surgical)<br>Setting: acute care hospital | Prospective cohort study      | 1940 (2.5%), 48<br>Stage $\geq 1$    | Model 1: 14 (6)                         |       | OR    |            | Moderate |
|                               |   | Logistic regression           | Model 1: sig. clinical features      | Application of external force           | .01   | 2.42  | 1.20-4.91  |          |
|                               |   |                               |                                      | BMI classification (vs. marasmus <18.5) |       |       |            |          |
|                               |   |                               |                                      | Normal (18.5-22)                        | .03   | 0.34  | 0.14-0.83  |          |
|                               |   |                               |                                      | Overweight (23-24)                      | .04   | 0.21  | 0.07-0.65  |          |
|                               |   |                               |                                      | Operation time (h)                      | <.001 | 1.96  | 1.70-2.26  |          |
|                               |   |                               |                                      | Operative position (vs. horizontal)     |       |       |            |          |
|                               |   |                               |                                      | Prone position                          | .01   | 3.10  | 1.36-7.06  |          |
|                               |   |                               |                                      | Cardiopulmonary bypass                  | <.001 | 6.89  | 2.66-17.83 |          |
|                               |   |                               |                                      | Model 2: 12 (6)                         |       |       |            |          |
|                               |   |                               |                                      | Application of external force           | .002  | 3.02  | 1.49-6.10  |          |
|                               |   |                               |                                      | BMI < 18.5 (vs. $\geq 18.5$ )           | .01   | 2.95  | 1.26-6.88  |          |
|                               |   |                               |                                      | Operation time $\geq 6$ h (vs. < 6h)    | <.001 | 14.30 | 6.39-32.01 |          |
|                               |   |                               |                                      | Cardiopulmonary bypass                  | <.001 | 5.59  | 2.33-13.44 |          |
|                               |   |                               |                                      | Intraoperative blood loss               | .001  | 1.95  | 1.30-2.92  |          |
| González-Méndez et al. (2018) | 335 pts<br>Setting: ICU                             | Prospective cohort study      | 335 (8.1%), 27<br>Stage $\geq 1$     | 6 (3)                                   |       | HR    |            | Moderate |
|                               |   |                               |                                      | Severity (SAPS 3)                       | .009  | 1.04  | 1.01-1.07  |          |

|                         |   |                               |                                 |  |       |       |            |          |
|-------------------------|---|-------------------------------|---------------------------------|--|-------|-------|------------|----------|
|                         |   | Cox proportional hazard model |                                 | Days of immobilization                                   | <.001 | 0.44  | 0.3-0.65   |          |
|                         |   |                               |                                 | Complications  | .01   | 4.89  | 1.45-16.41 |          |
| Goodridge et al. (1998) | 330 pts<br>Setting: acute care hospital               | Prospective cohort study      | 330 (9.7%), 32<br>Stage ≥ 1     | 5 (1)  |       | OR    |            | High     |
|                         |   | Logistic regression           |                                 | No. of prevention strategies used prior to PI appearance | <.001 | 1.35  | NR         |          |
| Halfens et al. (2000)   | 320 pts.<br>Setting: hospital wards                   | Prospective cohort study      | 320 (14.7%), 47<br>Stage ≥ 1    | 7 (4)  |       | OR    |            | Moderate |
|                         |   | Logistic regression           |                                 | Braden scale sensory perception                          | <.01  | 3.65  | 1.43-9.33  |          |
|                         |   |                               |                                 | Age  | <.01  | 2.33  | 1.39-3.92  |          |
|                         |   |                               |                                 | Braden scale friction and shear                          | <.01  | 2.32  | 1.36-3.96  |          |
|                         |   |                               |                                 | Moisture   | <.01  | 2.08  | 1.23-3.51  |          |
| Han et al. (2018)       | 34.287 pts<br>Setting: university hospital            | Retrospective record review   | 34.287 (4%), 1368<br>Stage ≥ 1  | 10 (7)   |       | OR    |            | Low      |
|                         |   | Logistic regression           |                                 | Female   | <.001 | 1.36  | 1.21-1.54  |          |
|                         |   |                               |                                 | Age  | <.001 | 1.04  | 1.03-1.05  |          |
|                         |   |                               |                                 | <b>Admission method:</b> Wheelchair                      | <.001 | 0.39  | 0.32-0.46  |          |
|                         |   |                               |                                 | <b>Consciousness status:</b>                             |       |       |            |          |
|                         |   |                               |                                 | Drowsy   | <.001 | 1.83  | 1.83-7.77  |          |
|                         |   |                               |                                 | Stupor   | .001  | 1.71  | 1.71-7.45  |          |
|                         |   |                               |                                 | Semi-coma/coma   | .02   | 1.17  | 1.17-5.19  |          |
|                         |   |                               |                                 | Braden score   | <.001 | 0.69  | 0.69-0.72  |          |
| Kim et al. (2019)       | 53.923 pts<br>Setting: tertiary and general hospitals | Retrospective record review   | 53.923 (0.7%), 401<br>Stage ≥ 1 | 22 (11)  |       | HR    |            | Low      |
|                         |   | Cox proportional hazard model |                                 | Male gender  | <.001 | 1.54  | 1.26-1.88  |          |
|                         |   |                               |                                 | Age  | .017  | 1.00  | 1.00-1.01  |          |
|                         |   |                               |                                 | Fall   | <.001 | 18.94 | 9.69-37.02 |          |
|                         |   |                               |                                 | <b>Nursing needs:</b>                                    |       |       |            |          |
|                         |   |                               |                                 | SpO <sub>2</sub> Monitoring                              | <.001 | 1.98  | 1.53-2.57  |          |
|                         |   |                               |                                 | <b>ADL dependence:</b>                                   |       |       |            |          |
|                         |   |                               |                                 | Position   |       |       |            |          |
|                         |   |                               |                                 | Partial  | <.001 | 3.37  | 2.27-5.01  |          |
|                         |   |                               |                                 | Total  | <.001 | 5.84  | 3.63-9.40  |          |
|                         |   |                               |                                 | Ambulating   |       |       |            |          |
|                         |   |                               |                                 | Partial  | .049  | 0.66  | 0.44-1.00  |          |
|                         |   |                               |                                 | Toilet use   |       |       |            |          |
|                         |   |                               |                                 | Partial  | .012  | 1.73  | 1.13-2.65  |          |
|                         |   |                               |                                 | Total  | <.001 | 3.25  | 2.05-5.14  |          |
|                         |   |                               |                                 | <b>Staffing:</b>   |       |       |            |          |
|                         |   |                               |                                 | RN-HPPD  | <.001 | 0.20  | 0.13-0.30  |          |
|                         |   |                               |                                 | NA-HPPD  | <.001 | 0.12  | 0.04-0.34  |          |

|                         |   |                               |                                     |  |       |      |           |      |
|-------------------------|---|-------------------------------|-------------------------------------|--|-------|------|-----------|------|
| Lannering et al. (2016) | 331 pts<br>Setting: nursing homes   | Prospective cohort study      | 331 (7.9%), 26<br>Stage $\geq 1$    | Model 1: 15 (4)  |       | HR   |           | High |
|                         |   |                               |                                     | No. of drugs   | <.05  | 1.16 | 1.01-1.34 |      |
|                         |   |                               |                                     | No. of diagnoses   | <.05  | 1.32 | 1.00-1.73 |      |
|                         |   |                               |                                     | Hearing impairment scale                                 | <.05  | 2.06 | 1.10-3.83 |      |
|                         |   |                               |                                     | Hemiparesis/Limb impairment scale                        | <.05  | 1.96 | 1.04-3.70 |      |
|                         |   |                               |                                     | Model 2: n=323<br>Sociodemographics + DFRI scales        |       |      |           |      |
|                         |   |                               |                                     | Model 2: 10 (3)  |       |      |           |      |
|                         |   |                               |                                     | Age  | <.05  | 1.05 | 1.00-1.10 |      |
|                         |   |                               |                                     | No. of drugs   | <.05  | 1.14 | 1.03-1.27 |      |
|                         |   |                               |                                     | Mobility scale   | <.001 | 0.46 | 0.32-0.64 |      |
|                         |   |                               |                                     | Model 3: n=330<br>Sociodemographics + MNS scales         |       |      |           |      |
|                         |   |                               |                                     | Model 3: 11 (4)  |       |      |           |      |
| Latimer et al. (2019)   | 1047 pts<br>Setting: general medical and surgical clinical units                | Prospective cohort study      | 1047 (10.8%), 113<br>Stage $\geq 1$ | 3 (3)  |       | OR   |           | Low  |
|                         |   |                               |                                     | Age  | <.001 | 1.05 | 1.02-1.08 |      |
|                         |   |                               |                                     | No. of comorbidities                                     | .002  | 1.22 | 1.08-1.37 |      |
|                         |   |                               |                                     | Place of residence: aged care (vs. community)            | <.001 | 1.75 | 1.32-2.32 |      |
|                         |   |                               |                                     | Logistic regression                                      |       |      |           |      |
|                         |   |                               |                                     | Model 4: Sociodemographics + total score of three scales |       |      |           |      |
|                         |   |                               |                                     | Model 4: 7 (3)   |       |      |           |      |
|                         |   |                               |                                     | Age  | <.05  | 1.05 | 1.00-1.10 |      |
|                         |   |                               |                                     | No. of drugs   | <.05  | 1.15 | 1.03-1.30 |      |
|                         |   |                               |                                     | MNS  | <.01  | 0.86 | 0.78-0.94 |      |
| Magny et al. (2017)     | 585 pts<br>Setting: perioperative geriatric unit and tertiary teaching hospital | Prospective cohort study      | 548 (12%), 63<br>Stage $\geq 1$     | 32 (4)   |       | OR   |           | High |
|                         |   |                               |                                     | Albumin (1g/L increase)                                  | .003  | 0.90 | 0.84-0.96 |      |
|                         |   |                               |                                     | Atrial fibrillation                                      | .033  | 1.91 | 1.05-3.46 |      |
|                         |   |                               |                                     | Chronic coronary artery disease                          | .014  | 2.16 | 1.17-3.99 |      |
|                         |   |                               |                                     | Diabetes   | .02   | 2.33 | 1.14-4.75 |      |
|                         |   |                               |                                     | Logistic regression                                      |       |      |           |      |
| Manzano et al. (2013)   | 221 pts<br>Setting: ICU   | Prospective cohort study      | 221 (19%), 42<br>Stage $\geq 2$     | 4 (2)  |       | HR   |           | Low  |
|                         |   |                               |                                     | Age  | <.001 | 1.05 | 1.02-1.09 |      |
|                         |   |                               |                                     | Mattress group   | .029  | 0.44 | 0.21-0.92 |      |
|                         |   | Cox proportional hazard model |                                     |  |       |      |           |      |



|                         |   |   |  |   |  |  |   |          |
|-------------------------|---|---|--|---|--|--|---|----------|
| Manzano et al. (2014)   | 330 pts<br>Setting: ICU                                 | RCT<br><br>Cox proportional hazard model                      | 329 (11.9%), 39<br>Stage ≥ 2                 | 8 (2)<br><br>Implementation rate of turning schedule (%)<br>Type of admission (surgical)  | <br>.<.001<br>.02  | HR<br>0.97<br>2.44   | <br>0.95-0.98<br>1.14-5.23  | Moderate |
| Miličević et al. (2012) | 453 pts<br>Setting: rehabilitation clinic               | Retrospective record review<br><br>Logistic regression        | 453 (15.5%), 70<br>Stage not specified       | 5 (2)<br><br>PI on admission<br>FIM score on admission  | <br>.<.001<br>.02  | OR<br>4.10<br>0.90   | <br>1.90-8.70<br>0.94-0.99  | Moderate |
| Miller et al. (2020)    | 57227 pts<br>Setting: tertiary academic medical center  | Retrospective record review<br><br>Logistic regression        | 30005 (0.8%), 241<br>Stage ≥ 1 equivalent PI | 31 (7)<br><br>Length of stay (days)<br>Mean hemoglobin<br>Hba1c (>7%)<br>Overweight (BMI > 35)<br>Charlson comorbidity score<br>Minimum nutrition subscale<br>Minimum friction subscale             | <br>.<.001<br>.03<br>.02<br>.04<br>.<.001<br>.<.001<br>.<.001  | OR<br>1.01<br>0.89<br>1.72<br>0.60<br>0.81<br>0.49<br>0.23 | <br>1.01-1.01<br>0.81-0.99<br>1.08-2.74<br>0.38-0.97<br>0.71-0.91<br>0.33-0.73<br>0.14-0.36 | Moderate |
| Nixon et al. (2006)     | 1972 pts<br>Setting: acute care hospital                | RCT<br><br>Logistic regression                                | 1971 (10.5%), 207<br>Stage ≥ 2               | 13 (7)<br><br>Hospital<br>Acute admission<br>Baseline wound<br>Baseline skin trauma<br>Baseline stage 1 PI<br>Age<br>Diabetes   | <br>.02<br>.<.001<br>.<.001<br>.05<br>.001<br>.03<br>.047      | OR<br>NR<br>3.65<br>2.96<br>1.67<br>1.95<br>1.02<br>1.61   | <br>NR<br>2.27-5.85<br>1.73-5.08<br>1.00-2.80<br>1.31-2.91<br>1.002-1.04<br>1.01-2.56       | Low      |
| O'Brien et al. (2014)   | 2695 pts<br>Setting: ICU                                | Retrospective record review                                   | 2548 (10.7%), 288<br>Stage ≥ 2               | 11 (7)<br><br>Existing airway<br>BMI underweight (vs. normal)<br>Noncardiac surgery<br>History of congestive heart failure<br>History of renal failure<br>ASA classification 4,5 (vs. 1,2,3)<br>Age | <br>.<.001<br>.002<br>.<.001<br>.001<br>.001<br>.003<br>.<.001 | OR<br>5.28<br>2.70<br>1.84<br>1.78<br>1.75<br>1.63<br>1.02 | <br>3.63-7.67<br>1.45-5.04<br>1.31-2.59<br>1.27-2.49<br>1.27-2.39<br>1.19-2.23<br>1.01-1.03 | Low      |
| Okuwa et al. (2006)     | 259 pts<br>Setting: long-term nursing care/nursing home | Prospective cohort study<br><br>Cox proportional hazard model | 259 (12.7%), 33<br>Stage ≥ 2                 | 5 (3)<br><br>Ankle brachial index<br>Male gender<br>Length of bedfast period  | <br>.<.001<br>.003<br>.001                                     | HR<br>0.075<br>2.95<br>1.01                                | <br>0.023-0.242<br>1.45-6.01<br>1.004-1.015   | Moderate |

|                               |   |                                     |  |  |       |       |            |          |
|-------------------------------|---|-------------------------------------|--|--|-------|-------|------------|----------|
| Ooi et al.<br>(1999)          | 5518 pts<br>Setting:<br>nursing homes                       | Retrospective<br>record review      | 5518 (11.4%), 629<br>Stage ≥ 2         | 7 (6)  |       | OR    |            | Low      |
|                               |   | Logistic<br>regression              |  | Facility effects                                       |       |       |            |          |
|                               |   |                                     |  | Intermediate risk                                      | <.001 | 1.59  | 1.25-2.00  |          |
|                               |   |                                     |  | High risk  | <.001 | 1.88  | 1.49-2.36  |          |
|                               |   |                                     |  | Age  | .008  | 1.02  | 1.00-1.03  |          |
|                               |   |                                     |  | Diabetes   | .01   | 1.35  | 1.07-1.69  |          |
|                               |   |                                     |  | Fecal/urinary incontinence                             | <.001 | 1.56  | 1.24-1.96  |          |
|                               |   |                                     |  | Transfers  | <.001 | 1.45  | 1.17-1.79  |          |
| Osis and<br>Diccini<br>(2020) | 240 pts<br>Setting:<br>neurotrauma<br>reference<br>hospital | Prospective<br>cohort study         | 240 (18.8%), 45<br>Stage ≥ 1           | NR (4)   |       | OR    |            | Moderate |
|                               |   | Logistic<br>regression              |  | Moderate TBI   | <.01  | 7.03  | 1.86-26.47 |          |
|                               |   |                                     |  | Severe TBI   | <.01  | 10.91 | 2.70-44.08 |          |
|                               |   |                                     |  | Noradrenaline use                                      | <.01  | 1.04  | 1.01-1.07  |          |
|                               |   |                                     |  | Age  | .01   | 1.03  | 1.00-1.05  |          |
| Park and<br>Park<br>(2017)    | 202 pts<br>Setting: acute<br>care hospital                  | Retrospective<br>record review      | 202 (100%), 202<br>Stage not specified | 33 (11)  |       |       |            | High     |
|                               |   | Multiple<br>Stepwise<br>Regression  |  | Nutrition consultation                                 | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Ventilator   | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Sedative-hypnotics                                     | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Anti-inflammatory                                      | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Diarrhea   | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Steroid  | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Renal Failure  | .002  | NR    | NR         |          |
|                               |   |                                     |  | Gastrointestinal tube                                  | .02   | NR    | NR         |          |
|                               |   |                                     |  | Anticoagulant  | .01   | NR    | NR         |          |
|                               |   |                                     |  | Decreased consciousness                                | .03   | NR    | NR         |          |
|                               |   |                                     |  | Tracheostomy tube                                      | .04   | NR    | NR         |          |
| Perneger<br>et al.<br>(2002)  | 1190 pts<br>Setting: acute<br>care hospital                 | Prospective<br>cohort study         | 1190 (10.8%), 129<br>Stage ≥ 1         | 13 (6)   |       | HR    |            | Low      |
|                               |   | Cox<br>proportional<br>hazard model |  | Age (vs 16-59)   |       |       |            |          |
|                               |   |                                     |  | 70-79  | NR    | 2.5   | 1.5-4.4    |          |
|                               |   |                                     |  | 80-90  | NR    | 3.8   | 2.3-6.4    |          |
|                               |   |                                     |  | 90-96  | NR    | 5.2   | 2.6-10.6   |          |
|                               |   |                                     |  | Braden/Norton mobility scale                           | <.001 | 1.4   | 1.1-1.8    |          |
|                               |   |                                     |  | Braden friction/shear scale                            | .03   | 1.5   | 1.0-2.2    |          |
| Popow et<br>al. (2019)        | 733 pts<br>Setting:<br>hospital wards                       | Prospective<br>cohort study         | 733 (13%), 95<br>Stage not specified   | 20 (4)   |       | OR    |            | High     |
|                               |   | Logistic<br>regression              |  | Limited condition                                      | .001  | NR    | NR         |          |
|                               |   |                                     |  | Oedema   | .02   | NR    | NR         |          |
|                               |   |                                     |  | Neurological diagnosis                                 | <.001 | NR    | NR         |          |
|                               |   |                                     |  | Higher protein concentration during<br>hospitalization | .04   | NR    | NR         |          |

|                          |  |                               |                                  |  |       |                |             |      |    |  |
|--------------------------|--|-------------------------------|----------------------------------|--|-------|----------------|-------------|------|----|--|
| Rademakers et al. (2007) | 722 pts<br>Setting: acute care hospital    | Retrospective record review   | 722 (29.6%), 214<br>Stage ≥ 2    | 11 (5)                                 |       | OR             |             | Low  |    |  |
|                          |  | Logistic regression           |                                  | Diabetes                               | .02   | 1.70           | 1.08-2.66   |      |    |  |
|                          |  |                               |                                  | Urinary tract infection                | .004  | 1.87           | 1.22-2.85   |      |    |  |
|                          |  |                               |                                  | Postoperative hip dislocation          | .009  | 2.67           | 1.28-5.59   |      |    |  |
|                          |  |                               |                                  | ASA class 3/4                          | .001  | 4.19           | 2.88-6.10   |      |    |  |
|                          |  |                               |                                  | Time to surgery > 12h                  | .008  | 1.75           | 1.15-2.64   |      |    |  |
| Reed et al. (2003)       | 2771 pts<br>Setting: chronic care hospital | Retrospective record review   | 2771 (14.7%), 406<br>Stage ≥ 2   | 7 (6)                                  |       | OR             |             | Low  |    |  |
|                          |  | Logistic regression           |                                  | PI stage 1                             | <.001 | 3.13           | 2.41-4.06   |      |    |  |
|                          |  |                               |                                  | Malnourished                           | <.001 | 1.69           | 1.31-2.19   |      |    |  |
|                          |  |                               |                                  | Urinary catheter on admission          | <.001 | 1.55           | 1.38-1.75   |      |    |  |
|                          |  |                               |                                  | DNR order                              | <.001 | 1.52           | 1.22-1.90   |      |    |  |
|                          |  |                               |                                  | Confusion                              | .001  | 1.45           | 1.16-1.80   |      |    |  |
|                          |  |                               |                                  | Low albumin level                      | .014  | 1.40           | 1.07-1.83   |      |    |  |
| Rondinelli et al. (2018) | 466609 pts<br>Setting: community hospital  | Retrospective record review   | 453050 (0.4%), 1661<br>Stage ≥ 1 | 12 (6)                                 |       | HR             |             | Low  |    |  |
|                          |  | Cox proportional hazard model |                                  | Age                                    | <.001 | 1.36           | 1.25-1.45   |      |    |  |
|                          |  |                               |                                  | COPS 2 Score                           | <.001 | 1.10           | 1.04-1.16   |      |    |  |
|                          |  |                               |                                  | LAPS 2 Score                           | <.001 | 1.38           | 1.28-1.50   |      |    |  |
|                          |  |                               |                                  | Braden score                           | <.001 | 0.63           | 0.59-0.67   |      |    |  |
|                          |  |                               |                                  | Female gender                          | <.001 | 0.77           | 0.70-0.85   |      |    |  |
|                          |  |                               |                                  | Admission type ED/medical (yes)        | <.001 | 0.62           | 0.52-0.74   |      |    |  |
| Sala et al. (2020)       | 1587 pts<br>Setting: ICU                   | Retrospective record review   | 1587 (5.1%), 81<br>Stage ≥ 1     | 6 (2)                                  |       | OR             |             | Low  |    |  |
|                          |  | Logistic regression           |                                  | Mean arterial pressure < 60            | NR    | 8.22           | 1.74-147.07 |      |    |  |
|                          |  |                               |                                  | Lowest total Braden score              | NR    | 0.79           | 0.70-0.88   |      |    |  |
| Salzberg et al. (1999)   | 226 pts<br>Setting: acute care hospital    | Retrospective record review   | 226 (38.5%), 87<br>Stage ≥ 1     | Model 1: 8 (3)                         |       | OR             |             | High |    |  |
|                          |  | Logistic regression           |                                  | Extent of paralysis                    | <.001 | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Moisture                               | .003  | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Serum creatinine                       | .006  | NR             | NR          |      |    |  |
|                          |  | Cox proportional hazard model |                                  | Model 2: Cox proportional hazard model |       | Model 2: 8 (8) |             |      | HR |  |
|                          |  |                               |                                  | Extent of paralysis                    | <.001 | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Moisture                               | <.001 | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Serum creatinine                       | .007  | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Incontinence                           | <.001 | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Albumin                                | .03   | NR             | NR          |      |    |  |
|                          |  |                               |                                  | Mobility                               | .002  | NR             | NR          |      |    |  |
|                          |  | Pulmonary disease             |                                  | .01                                    |       |                |             |      |    |  |

|                           |  |                               |  |   |       |      |           |          |
|---------------------------|--|-------------------------------|--|---|-------|------|-----------|----------|
|                           |  |                               |  | Level of activity                           | .04   | NR   | NR        |          |
|                           |  |                               |  |   |       | NR   | NR        |          |
| Sardo et al. (2018)       | 6552 pts<br>Setting: medical and surgical wards  | Retrospective record review   | 6552<br>Stage ≥ 1                                | Model 1: 5 (2)                              |       | HR   |           | Low      |
|                           |  | Cox proportional hazard model | Model 1:<br>6552 (2.3%), 153                     | Braden Mobility                             | <.001 | 2.46 | 2.00-3.03 |          |
|                           |  |                               | Model 2:<br>1774 (5.5%), 97<br>Braden Score ≤ 16 | Braden Activity                             | <.05  | 1.24 | 1.02-1.52 |          |
|                           |  |                               | Model 2: 5 (2)                                   |   |       |      |           |          |
|                           |  |                               | Model 2:<br>1774 (5.5%), 97<br>Braden Score ≤ 16 | Braden Mobility                             | <.01  | 1.71 | 1.21-2.41 |          |
|                           |  |                               | Model 3:<br>4778 (1.2%), 56<br>Braden Score ≥ 16 | Braden Activity                             | .05   | 1.63 | 1.00-2.65 |          |
|                           |  |                               | Model 3: 5 (1)                                   |   |       |      |           |          |
|                           |  |                               | Model 3:<br>4778 (1.2%), 56<br>Braden Score ≥ 16 | Braden Mobility                             | <.001 | 3.20 | 2.03-5.04 |          |
| Schoonhoven et al. (2002) | 208 pts<br>Setting: acute care hospital          | Prospective cohort study      | 208 (10.1%), 21<br>Stage ≥ 2                     | 12 (1)                                      |       | OR   |           | Moderate |
|                           |  | Logistic regression           |  | Length of surgery                           | <.05  | 1.01 | NR        |          |
| Schultz et al. (1999)     | 413 pts<br>Setting: acute care hospital          | RCT                           | 413 (21.5%), 89<br>Stage ≥ 1                     | 7 (6)                                       |       | OR   |           | Low      |
|                           |  | Logistic regression           |  | Age   | .005  | 1.05 | 1.03-1.08 |          |
|                           |  |                               |  | Braden score on admission                   | .013  | 0.80 | 0.68-0.95 |          |
|                           |  |                               |  | BMI   | .015  | 0.91 | 0.85-0.98 |          |
|                           |  |                               |  | Exhibits fear                               | .001  | 0.31 | 0.16-0.62 |          |
|                           |  |                               |  | Diabetes                                    | .013  | 2.52 | 1.21-5.25 |          |
|                           |  |                               |  | Mattress overlay                            | .044  | 1.93 | 1.02-3.68 |          |
| Serpa et al. (2020)       | 1937 pts<br>Setting: acute care hospitals        | Prospective cohort study      | 1937 (5.9%), 114<br>Stage not specified          | 18 (8)                                      |       | OR   |           | High     |
|                           |  | Poisson regression            |  | Age   | <.001 | 1.05 | 1.03-1.06 |          |
|                           |  |                               |  | Hypertension                                | .022  | 1.62 | 1.07-2.45 |          |
|                           |  |                               |  | Public hospital (vs. private)               | <.05  | 0.61 | 0.39-0.95 |          |
|                           |  |                               |  | Length of hospital stay (days)              | <.001 | 1.04 | 1.03-1.06 |          |
|                           |  |                               |  | Clinical treatment (vs. surgical treatment) | .018  | 1.96 | 1.12-3.43 |          |
|                           |  |                               |  | NRS 2002 (vs. no risk)                      |       |      |           |          |
|                           |  |                               |  | Moderate risk                               | .003  | 3.48 | 1.51-8.0  |          |
|                           |  |                               |  | High risk                                   | <.001 | 4.40 | 2.03-9.54 |          |
|                           |  |                               |  | SGANS (vs. low risk)                        |       |      |           |          |
|                           |  |                               |  | Severe malnutrition                         | <.001 | 4.40 | 2.03-9.54 |          |
| Shaw et al. (2014)        | 297 pts<br>(surgical)<br>Setting: medical center | Prospective cohort study      | Model 1: 297 (9.8%), 29<br>Stage ≥ 1             | Model 1: 10 (6)                             |       | OR   |           | Moderate |
|                           |  |                               |  | Age   | NR    | 1.03 | 1.00-1.08 |          |

|                                 |  |                             |   |  |       |       |            |
|---------------------------------|--|-----------------------------|---|--|-------|-------|------------|
|                                 |  | Logistic regression         | PI assessment immediately after surgery in operating room           | Type of anesthesia (general anesthesia yes vs. no)       | NR    | 17.06 | 2.09-49.43 |
|                                 |  |                             |   | Type of operation position (non-supine vs. supine)       | NR    | 32.26 | 4.48-48.79 |
|                                 |  |                             | Model 2: 297 (5.1%), 15 Stage ≥ 1                                   | Type of surgery (orthopedics surgery vs general surgery) | NR    | 3.33  | 1.05-10.61 |
|                                 |  |                             |   | Admission Braden score                                   | NR    | 0.95  | 0.91-0.99  |
|                                 |  |                             | PI assessment 30 min after surgery in post anesthesia recovery room | Number of nursing intervention                           | NR    | 0.94  | 0.90-0.98  |
|                                 |  |                             |   | Model 2: 10 (5)  |       |       |            |
|                                 |  |                             |   | Age  | NR    | 1.06  | 1.00-1.12  |
|                                 |  |                             |   | Type of operation position (non-supine vs. supine)       | NR    | 18.18 | 1.32-52.63 |
|                                 |  |                             |   | Type of surgery  |       |       |            |
|                                 |  |                             |   | orthopedics surgery vs general surgery                   | NR    | 9.29  | 1.05-28.50 |
|                                 |  |                             |   | cardiac surgery vs general surgery                       | NR    | 22.60 | 1.20-43.85 |
|                                 |  |                             |   | Numbers of nursing intervention                          | NR    | 0.95  | 0.91-0.99  |
| Sternal et al. (2016)           | 329 pts<br>Setting: palliative care department | Retrospective record review | 245 (15.9%), 39 Stage not specified                                 | Model 1: NR (4)  |       | OR    | High       |
|                                 |  |                             |   | Waterlow score   | .001  | 1.14  | 1.06-1.23  |
|                                 |  | Logistic regression         | Model 1: factors at admission                                       | Patients admitted from other wards                       | .007  | 2.94  | 1.34-6.45  |
|                                 |  |                             |   | Hemoglobin level   | .012  | 0.81  | 0.69-0.96  |
|                                 |  |                             |   | Systolic blood pressure                                  | .023  | 0.98  | 0.96-1.00  |
|                                 |  |                             | Model 2: factors during hospitalization                             | Model 2: NR (5)  |       |       |            |
|                                 |  |                             |   | Mean evening body temperature                            | .001  | 3.38  | 1.73-8.49  |
|                                 |  |                             |   | Waterlow score   | <.001 | 1.19  | 1.09-1.31  |
|                                 |  |                             |   | Lowest recorded sodium concentration                     | .001  | 0.88  | 0.81-0.95  |
|                                 |  |                             |   | Mean systolic blood pressure                             | .003  | 0.96  | 0.93-0.98  |
|                                 |  |                             |   | Lowest recorded hemoglobin level                         | .016  | 0.80  | 0.67-0.96  |
| Strazzieri-Pulido et al. (2018) | 766 pts<br>Setting: ICU                        | Retrospective record review | 766 (18.7%), 143 Stage ≥ 1  | 10 (5)   |       | OR    | Low        |
|                                 |  |                             |   | Length of stay   | <.001 | 1.09  | 1.06-1.12  |
|                                 |  | Logistic regression         |   | Mechanical ventilation                                   | <.001 | 3.35  | 2.13-5.35  |
|                                 |  |                             |   | Palliative care  | .005  | 6.69  | 1.94-31.14 |
|                                 |  |                             |   | Age  | .003  | 1.02  | 1.01-1.03  |
|                                 |  |                             |   | NAS  | .012  | 1.02  | 1.00-1.03  |
| Suriadi et al. (2008)           | 253 pts<br>Setting: ICU                        | Prospective cohort study    | 253 (28.4%), 72 Stage ≥ 1   | NR (3)   |       | OR    | Moderate   |
|                                 |  |                             |   | Interface pressure                                       | NR    | 2.2   | 1.6-2.9    |
|                                 |  |                             |   | Body temperature   | NR    | 2.0   | 1.7-2.5    |

|                         |   |  |                                |  |  |  |   |          |
|-------------------------|---|--|--------------------------------|--|--|--|---|----------|
|                         |   |  |                                | Cigarette smoking  | NR   | 1.6  | 1.1-2.5   |          |
| Tescher et al. (2012)   | 12566 pts<br>Setting: intensive or progressive care units | Retrospective record review<br><br>Cox proportional hazard model | 12566 (3,3%), 416<br>Stage ≥ 2 | 15 (11)<br><br>Braden friction score (vs. score 3)<br>2<br>1<br>Braden activity score (vs. score 3/4)<br>2<br>Braden mobility score (vs. score 3/4)<br>2<br>Braden sensory perception score (vs. score 4)<br>3<br>2<br>Braden moisture score (vs. score 4)<br>3<br>2<br>Acute respiratory failure<br>Surgery within 5 days<br>Surgery after 5 days | <br><br><.001<br><.001<br><br><.001<br><br>.007<br><br>.004<br>.005<br><br><.001<br>.004<br>.006<br><.001<br><.001 | HR <sup>a</sup><br><br>5.98<br>60.34<br><br>1.79<br><br>1.52<br><br>1.62<br>1.71<br><br>1.79<br>1.77<br>1.36<br>0.43<br>0.37 | <br><br>3.04-11.79<br>30.57-119.12<br><br>1.26-2.56<br><br>1.12-2.05<br><br>1.16-2.26<br>1.18-2.47<br><br>1.37-2.36<br>1.20-2.61<br>1.09-1.69<br>0.29-0.64<br>0.28-0.49 | Moderate |
| Tourtual et al. (1997)  | 291 pts<br>Setting: acute care hospital                   | Prospective cohort study<br><br>Logistic regression              | 291 (21.6%), 63<br>Stage ≥ 1   | 14 (2)<br><br>Braden friction/shear<br>Braden moisture   | <br><br>.01<br>.007  | OR<br><br>NR<br>NR   | <br><br>NR<br>NR  | Moderate |
| Tsaousi et al. (2015)   | 471 pts<br>Setting: acute care hospital                   | Prospective cohort study<br><br>Logistic regression              | 471 (14.2%), 67<br>Stage ≥ 1   | NR (3)<br><br>Limited autonomy<br>MUST score<br>Artificial diet  | <br><br><.001<br>.001<br>.02   | OR<br><br>6.46<br>3.83<br>1.87   | <br><br>3.21-12.97<br>1.73-8.46<br>1.28-2.80  | Moderate |
| Tsaras et al. (2016)    | 236 pts<br>Setting: ICU                                   | Prospective cohort study<br><br>Logistic regression              | 210 (24.3%), 51<br>Stage ≥ 1   | NR (4)<br><br>Age<br>Length of ICU stay (days)<br>Hemodialysis<br>Hematocrit (%)   | <br><br>.03<br><.001<br>.03<br>.04   | OR<br><br>1.04<br>1.17<br>4.09<br>0.91   | <br><br>1.01-1.07<br>1.11-1.23<br>1.12-14.98<br>0.82-0.99   | Moderate |
| Vanderwee et al. (2009) | 235 pts<br>Setting: nursing home                          | RCT<br><br>Cox proportional hazard model                         | 235 (18.7%), 44<br>Stage ≥ 2   | 20 (5)<br><br>Age (vs. < 80 yrs)<br>≥ 90 yrs<br>Cerebral vascular accident<br>Urinary incontinence<br>Contractures<br>Hypotension  | <br><br>.015<br>.042<br>.004<br>.04<br>.002  | HR<br><br>0.35<br>1.94<br>0.24<br>2.02<br>3.42   | <br><br>0.15-0.82<br>1.10-3.70<br>0.09-0.64<br>1.03-3.95<br>1.56-7.49   | Moderate |

|                         |   |  |   |   |  |  |  |          |
|-------------------------|---|--|---|---|--|--|--|----------|
| Yatabe et al. (2013)    | 422 pts<br>Setting: intermediate and acute care wards | Prospective cohort study<br><br>Logistic regression    | 422 (7.1%), 30<br>Stage $\geq 2$ equivalent | 4 (2)<br><br>Female MNA   | <br><br>.01<br><.001                                 | OR<br><br>0.33<br>0.66                           | <br><br>0.14-0.77<br>0.53-0.81   | Moderate |
| Yoshimura et al. (2016) | 298 pts<br>Setting: acute care hospital               | Retrospective record review<br><br>Logistic regression | 277 (10.8%), 30<br>Stage $\geq 1$           | 3 (2)<br><br>Perspiration<br>Length of surgery and core temperature: More than 6 hours and more than 38.1°C   | <br><br>.037<br><.001                                | OR<br><br>3.09<br>8.45                           | <br><br>1.07-8.58<br>3.04-27.46  | Moderate |
| Zarei et al. (2019)     | 643 pts<br>Setting: ICU                               | Retrospective record review<br><br>Logistic regression | 643 (8.9%), 57<br>Stage $\geq 1$            | 8 (6)<br><br>Age $\geq 50$ yrs (vs. < 50 yrs)<br>Smoking<br>Length of stay $\geq 10$ days (vs. < 10 days)<br>Trauma hospitalization<br>Diabetes<br>Muscular paralysis | <br><br>.001<br>.001<br>.001<br>.001<br>.001<br>.001 | OR<br><br>2.9<br>2.1<br>4.0<br>1.4<br>3.5<br>5.1 | <br><br>1.48-5.67<br>1.28-3.45<br>2.27-7.05<br>1.10-1.79<br>1.52-8.03<br>2.84-9.15 | High     |

PI, pressure injury; NR, not reported; pts, Patients; RCT, randomized controlled trial; ICU, intensive care unit; <sup>a</sup> calculated effect size; SCI, spinal cord injury