Supplemental Table. STUDY CHARACTERISTICS

Study Authors, Year, Location	Study Sample, Setting, and Design	Inclusion Criteria	Risk Assessment Scale and Prevention Method	Significant Results in Multivariate Analysis	Limitations
Cox et al, 2020, US	1,460 patients in five ICUs Retrospective descriptive study of the MIMIC III dataset	Age ≥18 y ICU LOS > 24 h No preexisting PI	Braden Scale, repositioning support surface	Age[a] Male sex Cardiovascular disease[a] Peripheral vascular disease[a] Hypotension[a] Pneumonia or influenza[a] Septic shock[a] Moderate to severe malnutrition[a] Hemodialysis[a] Cardiovascular surgery[a] Norepinephrine[a] Braden Scale score	Age of data, missing data, single-site retrospective design
Cramer et al, 2019 US	50,851 patients in a tertiary ICU Retrospective design using MIMIC III dataset Data from admission used to create a predictor model using machine learning/artificial intelligence	Age ≥18 y ICU LOS > 24 h No preexisting PI	Braden Scale, prevention reduction device in analysis (not specified)	Stage 1 PI within first 24 h Glasgow Coma Scale score Blood urea nitrogen Partial pressure of oxygen[a] Cardiac surgery[a] Albumin[a] Medical ICU admission Pressure reduction device Mechanical ventilationa MAP[a]	Age of data, missing data, single-site retrospective design, low PI incidence
Hyun et al, 2019 US	12,654 patients in 3 adult ICUs Retrospective bivariate analysis to identify predictor variables, logistic regression for prediction model of 10 resulting variables	Age > 18 y No PI on admission ICU LOS ≥ 36 h First hospitalization First ICU stay No PI on ICU admission	Braden Scale, prevention strategies not listed	Male sex Diabetes[a] On isolation Braden Scale score Ventilator days[a]	Single-site retrospective design
Soodmand et al, 2019 Iran	133 patients from 4 ICUs (neurologic, general, trauma) Prospective, cross-sectional design	Age ≥18 y MV ≥24 h Absence of PI	Braden Scale, prevention strategies required but not in analysis	Age[a] MAP[a] Lower mean positive end-expiratory pressure[a]	More trauma patients in sample with fewer comorbidities, single site study
Strazzieri-Pulido et al, 2019 Brazil	766 patients in two university hospitals Retrospective cohort study Included use of mattress for PI prevention Charts from May to July 2012 at Hospital A and Sept to Dec 2012 at Hospital B	Adult patients Absence of PI on admission Admission > 24 hours No disseminated skin conditions such as burns	Hospital A used Braden but did not have a fully implemented protocol for prevention; Hospital B had a PI prevention protocol for Braden Scale score ≤ 16, specifics not provided	LOS[a] MV[a] Palliative care Age[a] Higher Nursing Activity Score	Retrospective study design

(continues)

Supplemental Table. STUDY CHARACTERISTICS, CONTINUED

Study Authors, Year, Location	Study Sample, Setting, and Design	Inclusion Criteria	Risk Assessment Scale and Prevention Method	Significant Results in Multivariate Analysis	Limitations
El-Marsi et al, 2018 Lebanon	145 MSICU patients Retrospective review of medical records	Age ≥17 y ICU LOS > 24 h No preexisting PIs	Braden Scale, prevention strategies not stated	ICU LOS[a] Total hours within the first 48-in the ICU with systolic BP < 90 mm HG[a] Vasopressor administration[a]	Single-site retrospective design
de Almeida Medeiros et al, 2018 Brazil	180 patients admitted to general ICU (90 cases, 90 controls) Retrospective case-control study	Age ≥18 years Case: stage 1 PI or greater Control: no PI	No risk assessment scale reported, no prevention strategies considered in analysis	Friction PI history Prolonged ICU admission[a] Dehydration Elevated temperature Treatment of comorbidities (not specified)	Single-site retrospective design
Pacha et al, 2018 Brazil	759 patients admitted to one of five ICUs (types unclear; 189 cases; 570 controls) Retrospective case-control study	None specified	No risk assessment scale cited, no prevention strategies reported.	Non-high school graduate Age[a] Infectious, parasitic, or neoplasm diagnosis LOS ≥8 d[a]	Single-site retrospective design
Gonzalez-Mendez et al, 2018 Spain	350 patients in one adult ICU (type not specified) Longitudinal, prospective, cohort study	Age ≥18 years ICU LOS > 24 h No preexisting PIs	Braden Scale, prevention based on PI risk score (not specifically reported)	Higher SAPS III score Length of immobilization (protective) Complications of hospitalization	Variable complications not well defined; single site
Kirkland et al, 2017 US	119 ICU patients Retrospective case-control design to determine factors that contribute to DTPI development	Age ≥18 years Development of DTPI that evolved into full-thickness PI during hospitalization	Braden Scale, no prevention strategies reported	Hemodialysis[a] Shock state[a] Lower diastolic BP[a] Time in surgery[a]	Only patients who developed DTPI; single-site retrospective design
Deng et al, 2017 China	468 patients admitted to medical ICU or CCU Retrospective, cluster sampling, stepwise logistic regression and decision-tree analysis of patients with Stage 2 or higher PI	Age > 18 y ICU LOS ≥ 24 h No PI on ICU admission No skin disease such as lupus or psoriasis No burns or other skin damage	Braden Scale, no prevention methods included	Age[a] ICU LOS[a] Diastolic BP < 60 mm Hg[a] Albumin level[a] Total Braden Scale score MV[a] Fecal incontinence	Single site retrospective design Bias in PI staging identified among staff nurses during documentation
Ranzani et al, 2016 Brazil	9,605 patients from 12 adult ICUs admitted to 11 hospitals Longitudinal, prospective, cohort study	First ICU admission ≥ 48 hours Braden score completed on admission PI developed during the first 30 days of ICU admission	Braden Scale; extensive education; ICU nurse coordinator provided weekly feedback	Age between 56-75 and >75 y[a] Male sex Diabetes[a] Hematologic malignancy Peripheral artery disease[a] Braden Scale score ≤ 13 MAP ≤ 60 on admission, MV in first 24 h of ICU stay Rapid response in first 24 h of admission	Single-site retrospective design
Tayyib, et al, 2016 Saudi Arabia	84 patients, ICU type not specified Prospective cohort study	Age ≥18 y ICU admission	Braden Scale, repositioning frequency included as independent variable	Age[a] ICU LOS[a] Infrequent repositioning	Small sample; Single-site design

Supplemental Table. STUDY CHARACTERISTICS, CONTINUED

Study Authors, Year, Location	Study Sample, Setting, and Design	Inclusion Criteria	Risk Assessment Scale and Prevention Method	Significant Results in Multivariate Analysis	Limitations
Bly et al, 2016 US	345 patients in the MSICU or CVICU Retrospective design	All patients admitted into adult ICU during study period No preexisting PIs	Braden Scale reported most patients at risk, support surface days to support surface change	No. of d to bed change Any transport off unit 1+ vasopressors[a] Systolic BP < 90 mm Hg[a] Pulmonary disease Feeding tube	Small sample; single-site retrospective design
Cox and Roche, 2015 US	306 patients in the CVICU or MSICU Retrospective cohort study	Age ≥ 18 y No preexisting PI ICU LOS ≥ 24 h Vasopressor administered during admission	Braden Scale; low airloss surface/prevention not included in analysis	Cardiac arrest[a] MV > 72 h[a] Hours of MAP < 60 mm Hg on vasopressors[a] Vasopressin[a] Cardiac diagnosis (protective)	Single-site retrospective design
Campanili et al, 2015 Brazil	370 patients in a cardiopulmonary ICU Epidemiologic prospective cohort study	Age ≥ 18 y ICU LOS ≥ 24 h No preexisting PI Braden Scale score ≤ 18	Braden Scale, no prevention strategies reported	ICU LOS > 9.5 d[a] Age 42.5 or older[a] Caucasian	Single-site retrospective design
Apostolopoulou et al, 2014 Greece	216 patients in a MSICU Prospective cohort study	ICU admission ≥ 48 h MV No preexisting PI	Cubbin/Jackson scale, no prevention strategies reported	Jackson/Cubbin scale score ≤ 29 >20 d on MV[a]	Single site, only patients on MV
Nassaji et al, 2014 Iran	352 patients (160 smokers and 192 nonsmokers) in MSICU Prospective cohort case-control study	Male sex Age ≥ 18 y ≥24 h ICU admission No preexisting PI	No risk assessment reported. no prevention strategies reported	Higher smoking pack-years[a] Older age[a] ICU LOS[a] Diabetes[a] Trauma Anemia[a]	Men only; women excluded because of low smoking rates
Efteli and Gunes, 2013 Turkey	98 ICU patients (type not specified) Prospective, descriptive study	Age ≥ 18 y Expected admission ≥7 d No preexisting PI Braden score <12	Braden Scale, PI prevention stated but not included in analysis	Female sex Low serum albumin[a]	Small sample, single-site design
O'Brien et al, 2013 US	2,695 ICU patients who underwent operative procedures (ICU type not specified) Retrospective observational study	ICU admission ≥ 48 h Surgical procedure No preexisting PI Developed Stage 2 or higher PI during admission	No risk assessment scale reported, no prevention strategies reported	Preoperative predictors: ASA risk class 4 or 5 Underweight BMI Noncardiac surgery[a] History of congestive heart failure[a] Renal disease/failure[a] Existing airway prior to OR[a] Age[a] Intraoperative predictors: Blood products	Single-site retrospective design
Tschannen et al, 2012 US	3,344 ICU admissions (type not specified) Retrospective cohort study	Age >18 y ICU LOS > 48 h Surgical procedure No preexisting PI	Braden Scale, no prevention strategies reported.	Low BMI No. of vasopressors[a] Total no. of surgeries[a] Total OR time[a] Admission Braden Scale score High mortality predictor: APR DRG	Single-site retrospective design

Supplemental Table. STUDY CHARACTERISTICS, CONTINUED

Study Authors, Year, Location	Study Sample, Setting, and Design	Inclusion Criteria	Risk Assessment Scale and Prevention Method	Significant Results in Multivariate Analysis	Limitations
Serra et al, 2012 Italy	610 ICU patients (type not clearly specified) Retrospective cohort study	ICU LOS ≥ 24 h No preexisting PI	No risk assessment scale reported, no prevention strategies reported	Hypoalbuminemia[a] Diabetes[a] Congestive heart failure[a] Obesity Malnutrition[a]	Single-site retrospective design; included intermediate care units
Wilczewski et al, 2012 US	94 surgical ICU patients Retrospective cohort study	Patients with new spinal cord injury admitted to the ICU No preexisting PI	Braden Scale, support surfaces considered in analysis	MAP < 70 mm Hg for prolonged periods[a]	Single-site retrospective design
Cremasco et al, 2012 Brazil	160 ICU patients (type not specified) Prospective, descriptive study	ICU LOS ≥ 48 h No preexisting PI on admission	Braden Scale, no prevention strategies reported	Male sex Increased LOS[a] High nursing workload (protective) Increased SAPS score	Small sample, single-site design
Cox, 2011 US	347 MSICU patients Retrospective, descriptive, correlational study	Age ≥ 18 y ICU LOS > 24 h No preexisting PI	Braden Scale, no prevention strategies included in analysis	Age[a] ICU LOS[a] Cardiovascular disease[a] Braden mobility and friction/shear subscale scores (on admission)[a] Norepinephrine[a]	Single-site retrospective design
Manzano et al, 2010 Spain	299 ICU patients (type not specified) Prospective cohort study	Age < 18 y All patients on MV > 24 h during ICU stay Development of new Stage 2 or higher PI	No risk assessment scale reported, no prevention strategies reported	Age[a] ICU admission in winter First day SOFA respiratory score[a] Fourth day SOFA C-V score Length of MV prior to PI development[a]	Only patients on MV
Slowikowski and Funk, 2010 US	369 surgical ICU patients Prospective, descriptive, cross-sectional study	No specific inclusion criteria stated	Braden Scale, no prevention strategies used in analysis reported	Lower Braden Scale score Diabetes[a] Age ≥70 y[a]	Inclusion/exclusion criteria not stated; single-site design
Kaitani et al, 2010 Japan	98 ICU patients (type not specified) Prospective cohort study	Age ≥ 20 y No preexisting PI ICU LOS ≥ 24 h	No risk assessment scale reported; support surface, turning/repositioning	Infrequent turning/ positioning Emergent ICU admission	Low PI incidence, small sample, single-site design

[a]Risk factor present in the conceptual schema

Abbreviations: APR-DRG: all patients refined diagnosis-related group; ASA, American Society of Anesthesiologists; BMI, body mass index; CVICU, cardiovascular ICU; DTPI, deep-tissue PI; LOS, length of stay; MAP, mean arterial pressure; MIMIC III, Medical Information Mart for Intensive Care database; MSICU, medical surgical ICU; MV, mechanical ventilation; PI, pressure injury; SAPS, Simplified Acute Physiology Score; SOFA, Sequential Organ Failure Assessment; SOFA C-V, SOFA cardiovascular score.