Supplement 1 – Study characteristics table

Characteristics of included studies on pressure injury prevention					
Author, Year & Title	**Study design**	**Setting**	**Population**	**Intervention**	**Main results on pressure injury prevention**
Andayani et al., 2020 *Assessing effectiveness of regular repositioning in preventing pressure ulcers in children*	Quasi-experiment pretest-posttest design	Pediatric area	Pediatric patients between 1 month and 18 years with a treatment length of over 24 hours Intervention group (n = 43) Control group (n = 50)	Patients in the intervention group were repositioned every 2 hours, and the control group received a pressure mattress, which is done for 14 days or until the child can go home	Significant difference in the Braden Q scores from before and after repositioning of the intervention group and the control group using pressure mattress (p > 0.001).
Bargos-Munárriz et al., 2020 *Prevention of pressure injuries in critically ill children: A preliminary evaluation*	Quasi-experimental before-after study	Pediatric intensive care unit	Pediatric patients up to 14 years old are at risk of suffering from pressure injuries Intervention group (n = 60) Control group (n = 50)	Evaluation of the effectiveness of the care bundle implementation based on the latest evidence (intervention group) vs. the application of non-standardized care (control group)	The cumulative incidence in pediatric patients exposed to the risk of pressure injuries was reduced from 16% to 13.3% and in the subgroup of patients with prolonged stay (>28 days), the incidence was reduced from 55.55% to 20%. In total, the number of pressure injuries decreased by 21.43%.
Behr et al., 2020 *Prevention Strategies for Neonatal Skin Injury in the NICU*	Systematic review	NICU	Neonates	–	Barriers were the main interventions for the prevention of pressure injuries, medical adhesive skin injuries, diaper dermatitis, and general skin condition. The types of barriers included hydrocolloids, polyurethane-based dressings, film-forming skin protectants, or emollients. Non-barrier interventions included rotation between a mask and nasal continuous positive airway pressure interfaces, and utilization of prescribed guidelines to decrease pressure injuries.
Blazier et al., 2023 *Neonatal Electroencephalogram Electrode-Related Pressure Injury Prevention Quality Improvement Study*	Quality improvement study	NICU	Neonates Study period 1 (n = 76) Study period 2 (n = 80) Study period 3 (n = 139)	Development of an evidence-based intervention bundle to prevent EEG electrode-related pressure injuries. In Study Period 1 they built a baseline, in Period 2 the interventions were implemented	The structured study interventions eliminated EEG electrode-related pressure injury events in infants monitored with EEG. Preventive interventions at the EEG-electrode level coupled with skin assessment successfully reduce pressure injuries in neonates.

				and in Study Period 3 they worked on the sustainability	
Boyar, 2020 *Pressure Injuries of the Nose and Columella in Preterm Neonates Receiving Non-invasive Ventilation via a Specialized Nasal Cannula*	Quasi-experimental design	NICU	Neonates with a gestational age of 28 weeks or younger Study period 1 (*n* =80) Study period 2 (*n* = 27) Study period 3 (*n* = 128)	Study period 1: thin-walled nasal cannula + foam barrier Study period 2: thin-walled nasal cannula and no foam barrier Study period 3: thin-walled nasal cannula + foam barrier	The differences between the study periods reflect a 6-fold increase in nasal injury that occurred when NCPAP was administered without the use of the protective barrier dressing.
Boylan, 2020 *Paediatric pressure injuries: considerations for this patient cohort*	Systematic review	All clinical settings	Neonatal and pediatric patients	–	Undertaking a comprehensive assessment of the child, including pressure injury risk, skin assessment, nutritional status, and pain, is paramount to understanding pediatric patients' needs and implementing an individualized pressure injury prevention and management plan.
Chen et al., 2020 *Investigating the Efficacy of Hydrocolloid Dressing for Preventing Nasotracheal Tube-Related Pressure Injury in the PICU*	Randomized controlled trial	PICU	Pediatric patients received invasive mechanical ventilation via nasotracheal tube Intervention group (*n* = 60) Control group (*n* = 62)	Hydrocolloid dressing for covering the area from the nasal columella to the ala vs. care without hydrocolloid dressing	Hydrocolloid dressing can reduce the occurrence rate of nasotracheal tube-related pressure injury in children with long-term nasotracheal intubation, and significantly improve the endurance of the nasal skin.
Ciprandi et al., 2022 *The clinical effectiveness of an integrated multidisciplinary evidence-based program to prevent intraoperative pressure injuries in high-risk children undergoing long-duration surgical procedures: A quality improvement study*	Monocentric, interdepartmental, interventional prospective cohort quality improvement study	Operation room	Pediatric patients undergoing long-duration surgical procedures Prospective cohort group (*n* = 200) Historical control group (*n* = 200)	The intervention comprised the establishment of wound prevention teams, modified HAPI risk assessment tools, specific education, and the use of prophylactic dressings and fluidized positioners during long-duration surgical procedures	Reduction in HAPI in the intervention group of 80% ($p < 0.01$) compared to the control group.
Cummins et al., 2019 *Reducing Pressure Injuries in the Pediatric Intensive Care Unit*	Quality improvement project (Pretest-Posttest)	PICU	Preintervention (*n* = 51) Postintervention (*n* = 29)	Implementation of pressure injury prevention strategies including turning every 2 hours, optimizing nutrition, and educational sessions for nurses	Educational sessions increased PICU nurses´ knowledge of pediatric pressure injuries. The turning compliance improved throughout the quality improvement project.

					The weekly PI-incidence rate before the education was 8% and the rate decreased to 3% during the quality improvement project.
Delmore et al., 2019 Pressure Injuries in the Pediatric Population: A National Pressure Ulcer Advisory Panel Whitepaper	Systematic review	All clinical settings	Pediatric patients	-	The pediatric population requires special consideration, protocols, and approaches compared with adults or other specific populations. The wound care discipline must construct standardized approaches that involve targeted risk assessment, evidence-based guidelines, and wound treatments specific to the vulnerable population. Therefore, it is necessary to work in interprofessional teams.
García-Molina et al., 2018 *Pressure Ulcers´ Incidence, Preventive Measures, and Risk Factors in Neonatal Intensive Care and Intermediate Care Units*	Observational study	NICU, NIMCU	Infants under 30 days (*n* = 268)	-	Risk increased with the length of stay, while the presence of medical devices, particularly non-invasive mechanical ventilation, is the main causal relationship. The study determined that the mobilization of hospitalized neonates, whether performing repositioning or applying the kangaroo care method, was an important preventive measure.
Imbulana et al., 2018 *A Randomized Controlled Trial of a Barrier Dressing to Reduce Nasal Injury in Preterm Infants Receiving Binasal Non-invasive Respiratory Support*	Randomized controlled trial	NICU	Infants born <30 weeks of gestation and/or birth weight <1250 g and received more than 4 hours, but less than 48 hours of CPAP Intervention group (*n* = 53) Control group (*n* = 55)	Hydrocolloid nasal barrier dressing during CPAP vs. no barrier dressing	Prophylactic use of a nasal barrier dressing within 48 hours of commencing treatment with binasal CPAP in very preterm or very low birth weight infants reduces nasal injury.
Johnson et al., 2020 *Key Drivers in Reducing Hospital-acquired Pressure Injury at a Quaternary Children's Hospital*	Quality improvement project (pre- and post-implementation)	All clinical settings	Children <21 years	Hospital-wide HAPI reduction initiative with actions grouped into 3 key driver areas: standardization, data transparency, and accountability	The results equate to an 82.5% reduction in the HAPI rate after the implementation of the HAPI-reduction initiative.
Kiss and Heiler, 2014	Quality improvement project (pre- and post-implementation)	Pediatric Cardiac Intensive Care Unit	Patients between the ages of 0 and 18 Pre-implementation (*n* = 100)	Implementation of an evidence-based practice guideline	Patients before implementation of the protocol were 1.35 times more likely to have skin breakdown than those admitted after implementation. A 41% incidence of skin

Pediatric Skin Integrity Practice Guideline for Institutional Use: A Quality Improvement Project			Post-implementation (*n* = 100)		breakdown before implementation of the guideline and an 18% incidence after implementation were identified.
Kriesberg Lange et al., 2018 *Reducing Pressure Injuries in a Pediatric Cardiac Care Unit*	Quality improvement project	Cardiac Care Unit	Neonates and children requiring cardiac surgery Pre-intervention group (*n* = 2168) Post-intervention group (*n* = 359)	Development and implementation of a guideline	During the pre-intervention period, 60 hospital-acquired pressure injuries were observed, 13 of which were higher than stage 3. In the post-intervention period, zero HAPI greater than stage 2 was observed. The development and use of a standardized pressure injury prevention protocol reduced the incidence, prevalence, and severity of HAPIs among patients in pediatric cardiac care units.
Krzyzewski et al., 2022 *Reducing Device-Related Pressure Injuries Associated with Non-invasive Ventilation in the Neonatal Intensive Care Unit*	Quality improvement project	NICU	Infants exposed to NIV Pre-NIV Guideline (*n* = 290) Post-NIV Guideline (*n* = 424) Post Skin-Care Bundle (*n* = 243) Sustainability group (*n* = 321)	Implementation of a clinical practice guideline promoting the use of NIV and implementation of a skincare bundle.	A collaborative and multidisciplinary team approach was used to promote engagement with clinical staff to address preventable harm. The implementation of a prevention bundle contributed to reducing harm while permitting the continued use of appropriate respiratory support to a highly vulnerable patient population. After the application of the skin care bundle, a decrease in NIV device-related skin PI was achieved, representing a 79% reduction.
Kulik et al., 2018 *Pressure Injury Prevention for Paediatric Cardiac Surgical Patients Using a Nurse-driven Standardized Clinical Assessment and Management Plan*	Quality improvement project	Cardiac ICU	Congenital pediatric cardiac surgical patients (*n* = 674)	Implementation of a strategy for pressure ulcer prevention	Before pressure ulcer prevention implementation, the overall pressure injury rate was 6.0/1000 patient days. After implementation, the overall pressure injury rate was 5.1/1000 patient days.
Lauderbaugh et al., 2022 *Reducing Mask-Related Pressure Injuries in Pediatric Patients during Non-invasive Ventilation by Targeting Patient Mask Leak*	Quality improvement project	Pediatric general wards and ICU	Pediatric acute care patients with non-invasive ventilation aged 1.5 months to 21 years	Implementation of a pressure injury prevention bundle for respiratory devices	Before the intervention, 5.2% incurred pressure injury, yielding an incidence rate of 0.26 per 1,000 patient days. In the four months of post-intervention data collection, there were 0% incurred pressure injuries, which means a 5.2% reduction.
Lawrence et al., 2021 *Sustained Reduction of Nasal Pressure Injuries in the Neonatal Intensive Care Unit with the Use of*	Quality improvement project	NICU	Premature infants	Implementation of an evidence-based BCPAP Skincare Protocol	Before beginning the project, the NICU documented 6 nasal pressure injuries over 6 months. During the first 3 months post-protocol implementation period, one stage 2 nasal injury was noted and immediately

Bubble Continuous Positive Airway Pressure					treated and healed without incident. During the next 24-month, post-implementation period, there were zero nasal pressure injuries reported.
Luton et al., 2017 *Preventing Pressure Injuries in Neonates Undergoing Therapeutic Hypothermia for Hypoxic-Ischemic Encephalopathy*	Quality improvement project	NICU	Neonates undergoing therapeutic hypothermia	Implementation of evidence-based intervention guidelines to reduce PI in a highly specific population	After implementation, they reported a zero HAPI rate in the hypoxic-ischemic encephalopathy population getting therapeutic hypothermia.
Manzo et al., 2023 *Content Validity of a Safe Nursing Care Checklist for a Neonatal Unit*	Online survey	NICU	Nurses with at least two years of NICU working experience and certification in neonatal nursing First round (n = 43) Second round (n = 43) Third round (n = 32)	Development of an evidence-based checklist and validation process of the instrument with nursing experts	The final checklist contained 45 items with a content validation index score greater than 90%. The instrument was structured into six dimensions, of which one dimension shows pressure injury/skin injury prevention.
Miske et al., 2017 *Airway and Injuries. Protecting Our Pediatric Patients from Respiratory Device-Related Pressure Injuries*	Quality improvement project	Different pediatric wards	Pediatric patients	Implementation of an evidence-based practice journey for non-invasive positive pressure ventilation-related hospital acquired pressure injuries prevention Implementation of an evidence-based practice journey for tracheostomy-related hospital-acquired pressure injury prevention	Tracheostomy securement device-related pressure injuries decreased after implementation. It is necessary to comprehend the mechanism of pressure injury development and recognize the ability to prevent skin injury. To deliver evidence-based care, ongoing research is needed to identify best practices, implement them, and sustain their use.
Moser et al., 2022 *Prevention of Tracheostomy-Related Pressure Injury: A Systematic Review and Meta-Analysis*	Systematic review & meta-analysis	Critical care	Critically ill adult and pediatric patients (n = 2023)	Effectiveness of Interventions to reduce tracheostomy-related Pressure Injury	Studies involving pediatric patients showed a mean tracheostomy-related pressure injury incidence of 20.1% with standard care vs. 4.5% in intervention groups, a reduction of 78%. The use of hydrophilic dressings and foam collars decreased the incidence of tracheostomy-related pressure injuries.
Newnam et al., 2015 *A Comparative Effectiveness Study of Continuous Positive Airway*	Randomized experimental study	NICU	Preterm infants with a weight of 500–1500 grams	Patients were randomized into one of the three groups 1) continuous nasal prongs, 2) continuous nasal mask,	Less skin injury when mask/prongs are systematically rotated when compared to continuous mask or continuous prongs group.

Pressure-Related Skin Breakdown when Using Different Nasal Interfaces in the Extremely Low Birth Weight Neonate			Nasal prongs group (*n* = 21) Nasal Mask group (*n* = 35) Alternating mask/prongs group (*n* = 22)	3) alternating mask/prongs every 4 hours	
Nie, 2020 *Creating a Pediatric and Neonatal Pressure Injury Prevention Program when Evidence was Sparse or Absent*	Quality improvement project	PICU	Pediatric patients	Development and implementation of a pediatric PI prevention bundle based on 3 pillars: skin assessment, risk assessment, and medical device assessment	PI prevalence fell from 9.4% to 3.4% over 12 months.
Nist et al., 2016 *Skin Rounds: A Quality Improvement Approach to Enhance Skin Care in the Neonatal Intensive Care Unit*	Quality improvement project	NICU	Neonates	Creation of an interdisciplinary skin team to identify skin injuries through weekly skin rounds and assessment of all patients at least twice daily for the presence of skin injuries. Interventions were implemented upon identification of a skin injury	After the initiation of skin rounds, the baseline incidence of pressure ulcers increased from 0.49 per 1,000 patient days to 4.6 per 1000 patient days, reflecting an improvement in detection and reporting. A dedicated skin team can improve the detection and reporting of skin injuries among NICU patients. Determination of the incidence of pressure ulcers is critical to develop targeted interventions.
Ottinger et al., 2016 The Pressure Is On! Neonatal Skin and Nasal Continuous Positive Airway Pressure	Case study	NICU	Preterm infant at 23 + 5 weeks' gestation	Different interventions based on reducing the pressure from medical devices and education sessions for nurses	Ensuring appropriate sizing of both the hat and the mask has been found to help reduce injury. The application of skin barrier adhesives or products is also strongly recommended. However, it is important to remember that these barrier devices function to reduce excoriation and not prevent pressure-related injury.
Palmer, 2013 *Prevention of Skin Breakdown in the Pediatric Intensive Care Unit*	Systematic review	PICU	All pediatric patients	–	Implementation of specific and manageable guidelines can help standardize skin care in the PICU and help in the reduction of the incidence of skin breakdown.
Pasek et al., 2021 *Prevention of Hospital-Acquired Pressure Injuries by Using a Tiered Protocol in Children Receiving ECMO in the Pediatric Intensive Care Unit*	Quality improvement project	PICU	Children aged from 4 days to 21 years (*n* = 29)	Implementation of a HAPI Prevention protocol	The rate of pressure injuries per 100 days of ECMO therapy decreased from 6.78 to 4.49 during the project. Before implementation, 36% of patients receiving ECMO had 1 or more pressure injuries. After implementation, such injuries occurred in only 19% of patients receiving ECMO – an improvement of 17%.

Peterson et al., 2015 *Clinical Nurse Specialist Collaboration to Recognize, Prevent, and Treat Pediatric Pressure Ulcer*	Quality improvement project	Different pediatric wards	All children	Implementation of organization-wide practice changes based on best practice	Reduction in pressure ulcer incidence from 3.3 per 1,000 patient days to 1.7 per 1,000 patient days. Reportable pressure ulcers were reduced by 60%. Improved awareness and prevention strategies also led to reductions in extracorporeal life support patient pressure ulcers and respiratory device-related pressure ulcers.
Razmus and Bergquist-Beringer, 2017 *Pressure Ulcer Risk and Prevention Practices in Pediatric Patients: A Secondary Analysis of Data from the National Database of Nursing Quality Indicators*	Descriptive secondary analysis	Pediatric acute care units	Patients aged 1 day to 18 years (*n* = 39 984 patients out of 678 pediatric care units in 271 US hospitals)	-	The extracted data included skin assessment, pressure-redistribution surface use, routine repositioning, nutritional support, and moisture management. Most of the pediatric patients were assessed for pressure ulcer risk within 24 hours of admission. The frequency of prevention intervention use among those at risk ranged from 99.2% for skin assessment to 70.7% for redistribution surface use. Most pediatric patients are being assessed for pressure ulcer risk, but the implementation of interventions to prevent pressure ulcers among children needs to be improved.
Reyna, 2015 *Preventing Pressure Ulcers in Pediatric Patients*	Quality improvement project	Different pediatric wards	All children	Implementation of a multidisciplinary pressure-ulcer prevention program	Since implementation, the pressure ulcer incidence has fallen 66%.
Rowe et al., 2018 *Implementation of a Nurse-Driven Pathway to Reduce Incidence of Hospital-Acquired Pressure Injuries in the Pediatric Intensive Care Setting*	Quality improvement project	PICU	Pediatric patients aged from 27 days to 20 years (*n* = 53)	Implementation of a pressure ulcer prevention bundle	Through implementation, there was a 57% decrease in reported HAPIs in the PICU.
Scheans, 2015 *Neonatal Pressure Ulcer Prevention*	Literature review		Neonates	-	Identification and description of interventions for assessment and preventive measures.
Schindler et al., 2013 *Under Pressure: Preventing Pressure Ulcers in Critically Ill Infants*	Quasi-experimental design	Tertiary Care Medical Center	Infants 0 to 3 months of age Intervention group (*n* = 250) Control group (*n* = 149)	Implementation of a pressure ulcer prevention bundle	The implementation of the care bundle was associated with a drop in pressure ulcer incidence from 18.8% to 6.8%.

Simsic et al., 2019 *Prevention of Pressure Ulcers in a Pediatric Cardiac Intensive Care Unit*	Quasi-experimental quality project	Pediatric Cardiac Intensive Care Unit	Infants <30 days	Implementation of a pressure ulcer bundle	Pressure ulcer > stage 2 decreased from 15.7 events per 1,000 patient days to a new baseline of 2.9 events per 1,000 patient days. Also, pressure ulcers related to immobility decreased.
Sullivan et al., 2021 *What Is the Best Approach to Prevent Advanced-Stage Pressure Injuries After Pediatric Tracheostomy?*	Literature Review		Children aged 0–18 years	–	Recommendation to consider the placement of an extended tracheostomy tube when individual patient head and neck anatomy permits and when available at the time of surgery. A foam pad should also be placed between the tracheotomy tube flanges and peristomal skin to control the amount of moisture in the wound bed and to redistribute the weight of the tracheotomy tube and ventilatory circuit.
Uysal et al., 2020 *Effect of Pressure Injury Prevention Guides Used in a Pediatric Intensive Care*	Pre-post intervention study	PICU	Children aged 0 to 18 years Control group (n = 181) Intervention group (n = 165)	Implementation of a pressure injury prevention guide	The results show that the risk of pressure injuries was reduced and pressure injuries occurred later when an evidence-based pressure injury prevention guide was used.