

Tissue Viability in Cardiac Patients on PICU

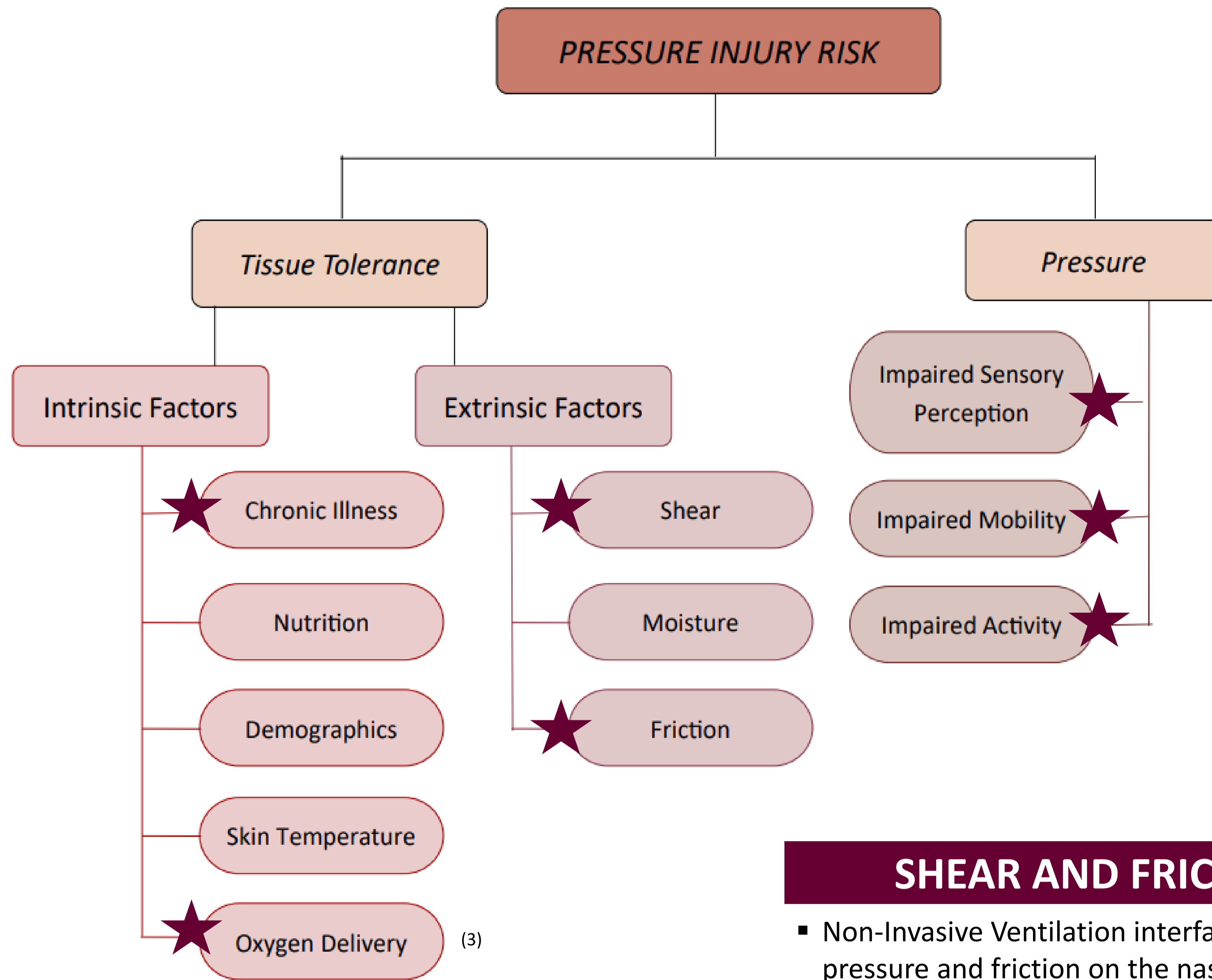
Samantha Mather BSc Childrens Nursing, RCN. Email Samantha.Mather@UHBW.NHS.UK

• Presenter- Hannah Malkin •

Introduction and aims

The aim of this discussion is to identify risk factors commonly seen in Intensive Care Cardiac patients, and potential solutions to mitigate pressure damage in this high-risk category.

Patients admitted to a Paediatric Intensive Care (PIC) are at higher risk of developing pressure ulcers with a stay longer than 4 days (1). Within Bristol Royal Hospital for Children (BRHC) and increase in pressure injuries has been noted by nursing staff and in DATIX reports.



IMPAIRED SENSORY PERCEPTION, MOBILITY AND ACTIVITY

- All factors affected by post operative sedation- 30% of pressure ulcers related to immobility (16)
- Sedation reduces perception of pressure points + medical devices = increased opportunities for pressure damage (15).
- Bypass time/Junctional Ectopic Tachycardia Risk (6)/Neuroprotection means active cooling and prolonged muscle relaxants for minimum 48hrs
- Prolonged operative times increase the risk of pressure sores (minimal pressure relief on the operating table (10))

ONGOING DEVELOPMENT AND PREVENTION MEASURES

- Ensure IV access/support boards are not causing pressure, **face mask relief is given when appropriate**, ventilation tubing is clear of patient, and pulse oximetry sites are rotated. (Intravenous lines, support boards and respiratory support are most associated with paediatric pressure sores (15))
- Occipital regions should be heavily monitored
- **Change in standardised intra-operative procedure:** during surgery use of appropriate size air cushions for the occipital region has shown a reduced incidence of injury post operatively (19)
- **Standardised bed set up for post operative cardiac patients to have a static overly mattress- including for baby-therm and cots (e.g. Repose mattress-associated with reduced pressure ulcer formation (20). Can be inflated once no longer cooling.**
- ALL cardiac patients (pre/post op) are high risk for pressure ulcers
- Air/Repose Mattress in all patients
- Utilise gel tape/pressure pads

NUTRITION

- 40% of children with Chronic Heart Disease are malnourished
- **THERE IS A CORRELATION BETWEEN CARDIAC FUNCTION AND FEED TOLERANCE**
- Increased energy expenditure in day-to-day life commonly results in failure to thrive/feeding difficulties (17)
- NGT Feeding for improved feed tolerance= pressure risk on nasal area
- Nil By Mouth (NBM) post operatively due to increased risk of Necrotising Enterocolitis (4) UHBW high feed risk protocol involves slower feed introduction
- Aortic arch conditions nil-by-mouth pre surgery
- POST OP- 50% Fluid allowance if on bypass, with gradual increase depending on SIRS response (5)

OXYGEN DELIVERY

- Low Cardiac Output Syndrome (LCOS), results in reduced peripheral perfusion (6)
- Poor peripheral blood flow can be attributed to the use of certain inotropes e.g. vasopressin, adrenaline, noradrenaline which are commonly used in LCOS (7)
- Cyanotic lesions/left sided ventricular dysfunction poor perfusion & poor associated oxygen delivery systemically
- Anaemia/Low Hb associated with frequent blood gas sampling/post operative bleeding

SHEAR AND FRICTION

- Non-Invasive Ventilation interfaces result in pressure and friction on the nasal septum and bridge (14)
- Invasive Ventilation- tapes, Anchor-fast and tracheostomy tapes increase friction risk when patients are not muscle relaxed. Invasive Lines and wounds dressings- changes required place patients at risk of friction if the dressings are not appropriately secured/removed gently
- **Having more than 2 invasive medical devices has been associated with an increased risk of pressure damage (8)**
- **OCCIPITAL AND FACIAL AREAS ARE MOST COMMONLY AFFECTED BY PRESSURE FROM MEDICAL DEVICES (9)**

MOISTURE

- Sweating associated with poor heart function (17) increases moisture, therefore increased Moisture-Associated Skin Damage (MASD)
- Oedema due to Systemic Inflammatory Response Syndrome (SIRS)/post operative fluid resuscitation for LCOS(13)
- Incontinence- cardiac patients less than 1 year old- pads/nappies in these patients leads to increased MASD
- Urine bypassing catheters sits on the skin

KEY POINTS

- **Cardiac PICU patients are at higher risk of pressure injury due to:**
 - Poor nutrition
 - Prolonged periods of muscle relaxation and sedation
 - Long term ventilation and IV access/NGT feeding
 - LCOS and poor peripheral perfusion
- **Introduction of standardised procedures for Pre Operative bed set up , Peri-Operative pressure relief, and Post Operative pressure relief, promoting air mattress use in all patients**

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