The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

I Evidence obtained from a systematic review of all relevant randomised control trials.
II Evidence obtained from at least one well designed randomised control trial.
III Evidence obtained from well-designed controlled trials without randomisation.
IV Evidence obtained from well-designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series
V Evidence obtained from systematic reviews of descriptive and qualitative studies
VI Evidence obtained from single descriptive and qualitative studies
VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). Evidence-based practice in nursing & healthcare: A guide to best practice (2nd ed.). Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.
National Health and Medical Research Council (2009). NHMRC levels of evidence and grades for recommendations for developers of guidelines (2009). Australian Government: NHMRC. http://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/evidence_statement_form.pdf
OCEBM Levels of Evidence Working Group Oxford (2011).The Oxford 2011 Levels of Evidence. Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=1025

Databases searched:	☒ CINAHL (Ebsco)	☐ Medline (Ebsco)	☐ Pubmed (NLM)	☒ Nursing (Ovid)	☐ Emcare (Ovid)
Keywords used:	Paediatrics, pediatrics, procedur*, procedural pain, non-pharmacological, distress, anxiety, hospital* parent*				
Search limits:	English, Years 2000 - 2020				
Other search comments:					

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Reference (include title, author, journal title, year of publication, volume and issue, pages)	Evidence level (I-VII)	Key findings, outcomes or recommendations
Bagheriyan, S., Borhani, F., Abbaszadeh, A., & Ranjbar, H. (2011). The effects of regular breathing exercise and making bubbles on the pain of catheter insertion in school age children. *Iranian Journal of Nursing and Midwifery Research*, *16*(2): 174–180.	II	• Deep breathing and bubbles reduce pain perception in children compared to neither • There is no difference in pain perception between using deep breathing and blowing bubble techniques – therefore the choice should be made on child preference
Birnie KA, Noel M, Chambers CT, Uman LS, Parker JA. (2018). Psychological interventions for needle- related procedural pain and distress in children and adolescents. Cochrane Database of Systematic Reviews, Issue 10.	I	• There is evidence for efficacy of distraction, hypnosis, CBT and breathing interventions for children's needle-related pain or distress.
Boles, J. (2013). Speaking up for children undergoing procedures: the ONE VOICE approach. *Pediatric Nursing 39*(5): 257-259).	VII	• Description of ONE VOICE program developed by child life therapists to reduce stress of procedures for children, families and staff. • Main principles: • One single voice should be heard during a procedure. • Need parental involvement. • Educate patient before the procedure about what is going to happen. • Validate the child with words. • Offer the most comfortable, non-threatening position. • Individualize your game plan. • Choose appropriate distraction to be used. • Eliminate unnecessary people not actually involved with the procedure.
Brown, Richard & Gerbarg, Patricia & Muench, Fred. (2013). Breathing practices for treatment of psychiatric and stress-related medical conditions. *The Psychiatric Clinics of North America. 36:* 121-40.	I	• Specific breath practices have been shown to be beneficial in reducing symptoms of stress, anxiety, insomnia, posttraumatic stress disorder, obsessive-compulsive disorder, depression, attention deficit disorder, and schizophrenia. • Slow breathing is safe in most patient populations • Technology such as apps can provide a helpful tool for breathing techniques

Fanurik, D. et al. (2000). Hospital room or treatment room for pediatric inpatient procedures: Which location do parents and children prefer?. *Pain Research and Managemen.. 5:* 148-156.	VI	• The hospital room was preferred by the majority of parents and children over the treatment room for minor procedures • Reasons for this choice included the child's emotional or physical comfort, convenience and difficulties moving the child due to motor impairment or medical condition. • The treatment room was generally preferred for more invasive procedures. • Reasons for this included concerns for the privacy of the child and roommate, and the need for special equipment or supplies
Fusco N et al. (2020). Hypnosis and communication reduce pain and anxiety in peripheral intravenous cannulation: Effect of language and confusion on pain during peripheral intravenous catheterization (KTHYPE), a multicentre randomised trial. *British Journal of Anaesthesia, 124*(3): 292	II	• Significant benefit of a hypnosis technique during a routine procedure • Hypnotic communication with a confusion technique compared with neutral or nocebo communication decreases pain and anxiety
Harrison, C. (2004). Treatment decisions regarding infants, children and adolescents. *Paediatrics & Child Health, 9*(2): 99–114.	VII	• Physicians should carefully assess factors for children and adolescents to make their own decisions, encourage decision-making by patients, families and the health care team together, and support capable patients who wish to make their own decisions.
Krauss B, & Green SM. (2000). Primary care. Sedation and analgesia for procedures in children. *New England Journal of Medicine, 342*(13): 938–945.	VII	• Recommendations for sedation for prolonged or painful procedures
Lewrick, J.L. (2016). Minimizing pediatric healthcare-induced anxiety and trauma. *World Journal of Clinical Pediatrics, 5*(2): 143-150.	VII	• Introduces framework to promote positive healthcare interactions with children: choice, agenda, resilience and emotion (CARE) - Choices: Offer power in a powerless environment - Agenda: Let patients and families know what to expect and what is expected of them - Resilience: Highlight strengths and reframe negatives; and - Emotional support: Recognize and normalize common fears and responses.
Loeffen, et al. (2020). Reducing pain and distress related to needle procedures in children with cancer: A Clinical Practice Guideline. *European Journal of Cancer, 131*: 53–67.	VII	• Clinical practice guideline developed in 2020 detailing the following: - Recommendation for the presence of parents as a comfort measure during procedures - Preparing the child and family for procedures and involving them in the planning Evidence table grading the level of evidence of each intervention
Mesibov GB, Browder DM, Kirkland C. (2002). Using individualized schedules as a component of positive behavioral support for students with developmental disabilities. *Journal of Positive Behavior Interventions, 4*(2):73-79).	VII	• Outlines the process of using personalised schedules for children with disabilities

Noel, M., et al.(2012). The influence of children's pain memories on subsequent pain experience. *Pain, 153*(8): 1563-1572.	IV	• Children's memory of pain intensity is a predictor of subsequent pain reporting • Emphasises the role of pain memory
Pillai Riddell, R., et al.(2011). Nonpharmacological management of procedural pain in infants and young children: an abridged Cochrane review. *Pain Res Management, 16*(5): 321-30.	I	• To assess the efficacy of nonpharmacological interventions for acute procedural pain in children up to three years of age • Sufficient evidence to support nonpharmacological interventions in infants and healthy neonates there was limited evidence to support these interventions with older infants and young children
Sometti D, Tinazzi M & Fiorio M. (2019). When words hurt: Verbal suggestion prevails over conditioning in inducing the motor nocebo effect. *European Journal of Neuroscience, 50*: 3311-3326.	III	• Emphasises the importance of positive verbal suggestion in enhancing coping
Srouji, R, Ratnapalan, S & Schneeweiss, S. (2010). Pain in Dhildren: Assessment and nonpharmacological management. *International Journal of Pediatrics*. 11.	VII	• Recommendations for parent involvement in planning procedures, including parent training and parents coaching their child • Also summarises interventions such as distraction, imagery, breathing exercises, non-nutritive sucking, skin to skin contact and swaddling.
Snyder BS .(2004). Preventing treatment interference: Nurses' and parents' intervention strategies. *Pediatric Nursing* 30*:* 31–40.	VI	• Reports that children who were physically restrained reported feelings of anger, resistance and discomfort which had ongoing negative memories for patients. • Alternative interventions such as building rapport, preparation, distraction and engagement with choice making for how an intervention is completed should be utilised to improve cooperation.
Taddio, A. et al. (2015). Procedural and physical Interventions for vaccine injections: systematic review of randomized controlled trials and quasi-randomized controlled trials." *Clinical Journal of Pain, 31 Supplement (10S)*: S20-S37.	I	• Synthesis of evidence on reducing vaccination pain in children • Recommendations for pain mitigation is based on five domains - procedural, physical, pharmacological, psychological and process • Relevant aspects include: • Parents to be present whenever possible in children under 10 • Use of breastfeeding under 2, and comfort holding in a sitting upright position • Use of sucrose
Twycross, A, Dowden, S & Bruce, E. (2013). *Managing pain in children: a clinical guide for nurses and health professionals.*. Wiley-Blackwell: United Kingdom.	VII	• Chapter 10: Management of painful procedures • Physiology, general principles
Vagnoli, A, Bettini, E, Amore, S, De Masi, A & Messeri, (2019). Relaxation-guided imagery reduces perioperative anxiety and pain in children: a randomized study. *European Journal of Pediatrics, 178*(6): 913- 921.	II	• Relaxation-guided imagery reduces preoperative anxiety and postoperative pain in children

Young, K. (2005). Pediatric Procedural Pain. *Annals of Emergency Medicine, 45*(2): 160-171.		• Review of the evidence for the long-term negative effects of poorly managed procedural pain • Impact of the environment on the child's perception of pain and stress reduction