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

Reference ***(include title, author, journal title, year of publication, volume and issue, pages)***	**Evidence level (I-VII)**	**Key findings, outcomes or recommendations**
Baxter, A.L., Watcha, M.F., Baxter, W.V., Leong, T., & Wyatt, M.M. (2011). Development and validation of a pictorial nausea rating scale for children. *Official Journal of the American Academy of Pediatrics, 127,* 1542. doi: 10.1542/peds.2010-1410	VI	- Authors developed a pictorial nausea scale (Baxter Retching Faces Scale) to assist health professionals in assessing nausea in paediatric patients - The goal of the study was to create and validate a pictorial scale with regular increment levels between scores to display increases in nausea severity - 30 oncology patients and 15 oncology nurses participated in the development and 127 patients participated in the validation of the scale - The vomiting face was selected by 90% of participants as the most severe type of nausea - Findings suggest that the scale is an effective tool for measuring nausea and vomiting and detecting change after anti emetic treatments and should be implemented for children less than 7 years of age in the paediatric oncology setting - The Visual Analogue Scale (VAS) was identified as a validated self-assessment tool for measuring the severity of nausea in participants older than 7 years of age
Duggin, K., Tickle, K., Norman, G., Yang, J., Wang, C., Cross, S.J., Gajjar, A., Mandrell, B. (2014). Aprepitant reduces chemotherapy-induced vomiting in children and young adults with brain tumors. *Journal of Pediatric Oncology Nursing, 31(*5*),* 277-283. doi: 10.1177/1043454214531090	IV	- Retrospective study; data from 18 participants with a history of high grade vomiting during radiation and chemotherapy was collected in a paediatric oncology unit (small study) - These participants were prescribed a 5HT3 receptor antagonist and aprepitent without a corticosteroid in the first course of chemotherapy. To determine the efficacy of aprepitant each participant was matched with 2 control participants who received identical treatments, with the omission of aprepitant - The results displayed a substantial decrease in vomiting in children who were prescribed a 5HT3 antagonist with aprepitant - 24 hours post the administration of HEC, 44% of the controls (no aprepitent) displayed delayed vomiting of grade 2 and 3, compared with 16% of aprepitent recipients - No neuropathic toxicities were observed during chemotherapy in either group and the mean absolute neutrophil count recovery time was identical in both groups - Findings concluded that the addition of aprepitant is beneficial in emetic control for this patient population and does not affect neutrophil recovery time

Dupuis LL, Boodhan S, Holdsworth M, et al. Guideline for the Prevention of Acute Nausea and Vomiting Due to Antineoplastic Medication in Pediatric Cancer Patients. Pediatric Blood Cancer. 2013 Jul;60(7):1073-82	IV-VII	- Paediatric review article - "We recommend that optimal control of acute AINV be defined as no vomiting, no retching, no nausea, no use of antiemetic agents other than those given for AINV prevention and no nausea-related change in the child's usual appetite and diet. This level of AINV control is to be achieved on each day that antineoplastic therapy is administered and for 24hours after administration of the last antineoplastic agent of the antineoplastic therapy block." - "Children 12 years old and receiving antineoplastic agents of high emetic risk which are not known or suspected to interact with aprepitant receive: ondansetron or granisetron/dexamethasone/aprepitant. "We recommend that children receiving antineoplastic agents of low emetic risk receive: ondansetron or granisetron." - "If given concurrently with aprepitant, reduce dexamethasone dose by half - "We recommend the following dexamethasone for children receiving moderately emetogenic antineoplastic therapy: <0.6m2: 2mg/dose IV/PO q12h>0.6m2: 4mg/dose IV/PO q12h."
Green, R., Horn, H., & Erickson, J. (2010). Eating experiences of children and adolescents with chemotherapy-related nausea and mucositis. *Journal Of Pediatric Oncology Nursing*, *27*(4), 209-216. doi:10.1177/1043454209360779	VI	- This qualitative study explored the eating experiences of children and adolescents during chemotherapy treatment - Findings suggested that all participants experienced nausea during their treatment and preferred not to eat during this time - It was highlighted that health care professionals must offer detailed meal suggestions during treatment periods to ensure patients maintain adequate growth, nutrition and weight to improve treatment tolerance and outcomes
Hart, J. (2009). Music therapy for children and adults with cancer. *Alternative & Complementary Therapies*, *15*(5), 221-225	V	- Findings suggest that music therapy 'reduces anxiety, and treatment related side effects, promotes relaxation, and provides patients with an identity beyond their cancer treatment' - Music therapy was described as soothing, an effective distraction method, fun and was associated with 'happy memories' - Participants receiving music therapy during chemotherapy administration report reductions in fear, anxieties, fatigue, and reported improved comfort levels - One relevant study highlighted throughout the review examined the efficacy of combined music therapy and relaxation imagery on pain and nausea in participants aged 5-65 undergoing a bone marrow transplant. Participants were involved in twice weekly, 45 minute music therapy sessions until discharge.

		Participants self reported a significant decrease in pain and nausea after combined music therapy and relaxation imagery sessions were initiated - Music therapy was concluded as a positive experience in the paediatric oncology population as it 'facilitates their adaptation to the new reality, increases their self-esteem and control of the situation, makes communication easier and improves their immune response to the disease thanks to the emotional support music provides'. - When 45 parents of children receiving treatment for cancer were surveyed regarding their experiences with music therapy, 87% reported playing music for their children in the week prior to chemotherapy, but 67% reported never playing music or listening to music with their children during their child's inpatient chemotherapy admission. Health professionals must continue to raise awareness of the importance of music therapy during chemotherapy and facilitate effective music therapy sessions in the paediatric oncology setting
Herrstedt J, Muss HB, Warr DG, et al. Efficacy and Tolerability of Aprepitant for the Prevention of Chemotherapy-Induced Nausea and Emesis over Multiple Cycles of Moderately Emetogenic Chemotherapy. Cancer. 2005 Oct 1;104(7):1548-55	II	- Adult study - Aprepitant, dexamethasone and ondansetron regimen was superior to dexamethasone and ondansetron alone at inducing sustained CR (no vomiting) across several cycles of moderate to highly emetogenic chemotherapy.
Hughes, D., Ladas, E., Rooney, D., & Kelly, K. (2008). Massage therapy as a supportive care intervention for children with cancer. *Oncology Nursing Forum*, *35*(3), 431-442. doi:10.1188/08.ONF.431-442	V	- Literature from 70 articles was reviewed to assess the efficacy of complementary therapies (massage) for children undergoing cancer treatment - Findings suggested that gentle massage techniques with light to medium pressure are appropriate methods for paediatric oncology patients - Massage therapy was concluded to reduce the duration and severity of nausea, pain, fatigue, and anxiety in the paediatric oncology setting - It was highlighted that paediatric oncology nurses are crucial in facilitating massage therapy and can assist patient outcomes by 'assessing, advocating and coordinating massage therapy sessions' in the paediatric oncology inpatient setting

Hussein, H.A. & Abdel Sadek, B.R. (2013). Acupressure for chemotherapy induced vomiting among school age children. *World Journal of Medical Sciences, 8(*4), 373-381. doi: 10.5829/idosi.wjms.2013.8.4.7581	II	- 50 school aged children with a diagnoses of leukemia were included in the trial - Findings supported the use of acupressure in paediatric oncology patients in combination with anti emetic medication regimes to decrease the frequency of vomiting during treatment - Participants between 6-18 years attended 6 education sessions regarding the benefits of acupressure and correct acupressure techniques. Children were then able to correctly demonstrated the correct acupressure techniques to independently continue during future treatments - Recommendations were made for health professionals to assist children in learning correct acupressure techniques to assist them in relieving their nausea associated with chemotherapy
Karagozoglu, S., Tekyasar, F., & Yilmaz, F. (2013). Effects of music therapy and guided visual imagery on chemotherapy-induced anxiety and nausea-vomiting. *Journal Of Clinical Nursing*, *22*(1-2), 39-50. doi:10.1111/jocn.12030	III	- Objective of study- to reveal the effects of music therapy and visual imagery on chemotherapy induced anxiety, nausea and vomiting - 40 adult participants were observed over 3 highly emotogenic chemotherapy cycles - Significant decreases were observed in anxiety levels and the rate and severity of CINV in participants who underwent music therapy and guided imagery during chemotherapy administration - Guided imagery consisted of nature images, depicting images of calming landscape views. Music therapy involved soft serene, instrumental music tracks - Participants stated that music therapy and visual imagery were important processes in coping with the stress and side effects associated with cancer treatment - Findings suggest that music therapy and visual imagery commenced 15 minutes prior to chemotherapy commencement and continue for the remainder of chemotherapy administration will achieve best outcomes
Kris MG, Hesketh PJ, Somerfield MR, et al. American Society of Clinical Oncology Guideline for Antiemetics in Oncology: Update 2006. J Clin Oncol. 2006 Jun 20;24(18):2932-47	I	- Adult study - **“**The three-drug combination of a 5-hydroxytryptamine-3 (5-HT3) serotonin receptor antagonist, dexamethasone, and aprepitant is recommended before chemotherapy of high emetic risk”. - “The three-drug combination of a 5-HT3 receptor serotonin antagonist, dexamethasone, and aprepitant is recommended for patients receiving an anthracycline and cyclophosphamide” - “For patients receiving other chemotherapy of moderate emetic risk, the

		Update Committee continues to recommend the two-drug combination of a 5-HT3 receptor serotonin antagonist and dexamethasone" - "In all patients receiving cisplatin and all other agents of high emetic risk, the two-drug combination of dexamethasone and aprepitant is recommended for the prevention of delayed emesis."
Mazlum, S., Chaharsoughil, N.T., Banihashem, A., & Vashani, H.B. (2013). The effect of massage therapy on chemotherapy-induced nausea and vomiting in pediatric cancer. *Iranian Journal of Nursing and Midwifery Research, 18(*4), 280-284	II	- RCT; data collected from 70 participants in a paediatric oncology unit aged 4-18 years - Participants received three, 20-minute massage sessions during three set time periods (24 hours prior to chemotherapy, half an hour before and 24 hours post completion of chemotherapy) - Massage techniques included a Swedish massage with effleurage, petrissage, friction and tapping movements with mild to moderate pressure - Participants continued regular anti emetic medication regimes during massage therapy treatments - Findings suggested massage as a useful intervention in reducing CINV in paediatric oncology patients after majority of nausea and vomiting cases decreased significantly after massage - Recommendations were made for health professionals to educate and empower families to participate in massage therapy during their child's treatment - It was encouraged that regular anti emetic medication regimes are continued in conjunction with massage therapy for optimal management of CINV - Using unscented massage oils will assist in minimising nausea associated with their scents
McKeon, C., Smith, C.A., Hardy, J., & Chang, E. (2013). Acupuncture and acupressure for chemotherapy-induced nausea and vomiting: A systematic review, *Australian Journal of Acupuncture and Chinese Massage, 8(1), 2-27*	I	- 6 randomised controlled trials included in the review - A minimum of 21 daily acupressure sessions were performed with 2 pressure points stimulated, in 1133 participants - Strong evidence displayed a reduction in the frequency of CINV and a reduction in the requirements of breakthrough antiemetics when acupressure was performed in combination with antiemetic medication

		regimes - It was recommended that acupressure be performed in combination with pharmacological management for best control of CINV in oncology patients - Findings suggest that the P6 acupressure point is the most effective point in targeting nausea and vomiting
National Cancer Institute. (2012). *Managing Chemotherapy Side Effects.* [Appetite Changes]. Retrieved September 20, 2014, from http://www.cancer.gov/cancertopics/coping/chemo-side-effects/appetite.pdf	VII	- Provides an comprehensive overview of appetite changes during chemotherapy administration - Recommendations are made surrounding dietary considerations during cancer treatment to minimise the risk and severity of CINV
Phillips, R., Gopaul, S., Gibson, F., Houghton, E., Craig, J., Light, K., & Pizer, B. (2010). Antiemetic medication for prevention and treatment of chemotherapy induced nausea and vomiting in childhood. *Cochrane Database Of Systematic Reviews*, (9), 350-359	I	- 27 articles included in the review, reporting on 28 trials - No language limitations were set during the literature search. All trials were translated to the English language to minimise language related publication bias - Clinical conclusions drawn from the review were as follows; • 5HT3 antagonists in the acute phase of chemotherapy proved more effective than older antiemetic agents even when those agents were combined with a corticosteroid • Administering dexamethasone in combination with 5HT3 antagonists in the acute phase of chemotherapy will double the likelihood of complete control of CINV • The administration of corticosteroids (dexamethasone) as a sole antiemetic agent remains questionable; therefore it was advised that for adequate control of CINV, corticosteroids should be used in combination with additional antiemetic drugs when administered for antiemetic purposes • Cannaboids were effective in reducing CINV, however increasing levels of unpleasant side effects were reported with their use

Rodgers, C., Norville, R., Taylor, O., Poon, C., Hesselgrave, J., Gregurich, M., & Hockenberry, M. (2012). Children's coping strategies for chemotherapy-induced nausea and vomiting. Oncology Nursing Forum, 39(2), 202-209. doi: 10.1188/12.ONF.202-209	IV	- This cohort study design is the second study to date evaluating the coping strategies of children suffering from CINV - 40 participants, aged 7-12 years scheduled for moderate to highly emetogenic chemotherapy were selected for the review - Findings suggest that wishful thinking, distraction, emotional regulation and problem solving were the strategies utilised most frequently by participants with an attempt to control CINV - Distraction was the active coping strategy intervention utilised the most, which was aimed at diverting the participant's attention away from CINV. Distraction included watching television, socialising, participating in crafts or playing games - Wishful thinking was highlighted as the most commonly used passive coping strategy, where children wished their CINV never occurred- this was concluded as an avoidance attitude with minimal benefit in managing CINV - Conclusive findings suggests that social support and distraction are the most effective coping strategies to reduce CINV for the duration of chemotherapy

The Children's Oncology Group. (2014). *Appetite Problems.* Retrieved September 20, 2014, from http://www.childrensoncologygroup.org/index.php/appetiteproblems	VII	- The following recommendations surrounding dietary requirements during chemotherapy are provided based on extensive research and expert opinions from The Children's Oncology Group (COG) - The author's emphasize the importance of adequate nutrition and nutritional assessments of paediatric patients undergoing chemotherapy and recommendations are made for patients experiencing CINV