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[Education of family members to support weaning to solids and nutrition in infants born preterm](#)

[Iodine supplementation for the prevention of mortality and adverse neurodevelopmental outcomes in preterm infants](#)

[Positive end-expiratory pressure for preterm infants requiring conventional mechanical ventilation for respiratory distress syndrome or bronchopulmonary dysplasia](#)

[Ultrasound guidance for injecting local anaesthetics in children to block pain transmission](#)

[Interventions for primary vesicoureteric reflux](#)

[Psychological therapies for parents of children and adolescents with a longstanding or life-threatening physical illness](#)

### **Education of family members to support weaning to solids and nutrition in infants born preterm**

Authors: Elfzzani Z, Kwok T, Ojha S, Dorling J

#### **Review question**

We wanted to find out whether providing education to family members on weaning premature babies would improve their growth and development. We defined premature babies as babies born more than three weeks before their due date.

#### **Background**

Weaning refers to the introduction of solid food in babies to complement their milk intake. Weaning is an important period of time for the growth of premature babies. They are normally smaller than expected for their age at this time. Hence, good nutrition during weaning can improve their growth and brain development, besides preventing future cardiovascular diseases. Nutrition education to family members may be needed to achieve good nutrition practices during weaning.

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## What we found

We examined the evidence available up to the 26 June 2018. No studies could be included in this review. The lack of eligible studies in this review is likely due to the scarce evidence in identifying the ideal weaning strategy for premature babies. We found two studies that investigated the ideal timing for weaning in premature babies. These, however, found conflicting results.

## What does it mean?

As there were no eligible studies, impact of nutrition education in weaning of premature babies is unknown. .

## Iodine supplementation for the prevention of mortality and adverse neurodevelopmental outcomes in preterm infants

Authors: Walsh V, Brown J, McGuire W

**Review question:** Does giving preterm infants iodine supplements reduce their risk of dying or improve their brain development?

**Background:** Infants born preterm (several weeks early) may not receive the recommended amounts of iodine in their diet, as both preterm human breast milk and nutrition given via a drip in hospitals do not contain enough iodine to meet their heightened needs. Deficiency of iodine may affect the production of thyroid hormones that are important for brain and lung development in newborn infants. Given concerns that iodine deficiency may be harmful, we reviewed all the available evidence from clinical trials that assessed the effects of giving preterm infants iodine supplements.

**Study characteristics:** The evidence is up to date as of February 2018. We found two relevant trials (including 1394 infants). Both trials used reliable methods to ensure that their findings were not biased.

**Key results:** Analysis of data from these trials showed that iodine supplements for preterm infants does not affect the chances of dying or improve longer-term brain development. This evidence was highly reliable.

**Conclusions:** The currently available evidence indicates conclusively that routine supplemental iodine does not have important benefits for preterm infants.

## Positive end-expiratory pressure for preterm infants requiring conventional mechanical ventilation for respiratory distress syndrome or bronchopulmonary dysplasia

Authors: Bamat N, Fierro J, Wang Y, Millar D, Kirpalani H

**Review question:** how do different positive end-expiratory pressure (PEEP) levels, or different approaches for selecting PEEP levels, compare on their effects in preterm infants with respiratory distress syndrome (RDS) or bronchopulmonary dysplasia (BPD)?

**Background:** infants born preterm (before 37 weeks' gestational age) often have respiratory failure and require medical support to achieve adequate pulmonary gas exchange (removing carbon dioxide from the blood and replenishing it with oxygen). RDS and BPD are complications of premature babies that describe early (RDS) and late (BPD) respiratory failure as a result of preterm birth. Conventional mechanical ventilation (the use of a breathing machine) following endotracheal intubation (placement of a breathing tube in the windpipe) is a commonly used therapy for both complications. While this therapy can improve pulmonary gas exchange and lead to benefits, it may simultaneously injure the lungs and cause harms. Gas exchange is achieved by several ventilator settings that help cycle heated, humidified and (sometimes) oxygen-enriched air in and out of the lungs. One of these settings is called PEEP, which is a continuous distending pressure applied throughout the respiratory cycle. It plays an important role in keeping the lungs open, enabling all areas of the lungs to undergo gas exchange. While the use of PEEP is generally accepted, it is not clear which PEEP levels maximize benefits while minimizing possible harms. An appropriate PEEP level may also be best achieved by an individualized approach in which a good PEEP level is determined on a patient-to-patient basis.

**Study characteristics:** we organized our study to compare the effect of low versus high PEEP levels, which we defined as: less than 5 cmH<sub>2</sub>O (low) versus 5 cmH<sub>2</sub>O or greater (high). Our primary outcomes were death by hospital discharge (for RDS) or two years of age (for BPD) and neurodevelopmental impairment (problems with growth and development of the brain or central nervous system) at two years of age. We identified four trials. Two trials with 28 infants compared different PEEP levels in infants with RDS. Two trials with 44 infants compared approaches for individually selecting PEEP levels. The compared approaches were: routine, typical practice (control) versus a "lung-recruitment maneuver." With this maneuver, investigators slowly increased and then decreased PEEP levels while monitoring for improvements in oxygenation to guide PEEP level selection. The evidence is up to date to 14 February 2018.

**Key results:** two trials comparing different PEEP levels in RDS did not report on any patient important outcomes. They compared the short-term effect of different PEEP levels on pulmonary gas exchange, and found no differences between low and high PEEP levels. The two trials comparing the lung-recruitment maneuver to control reported survival to hospital discharge or the development of BPD and found no clear difference between groups. However, they did suggest that an infant receiving the maneuver may have required less time on conventional mechanical ventilation and had better oxygenation for a period after the maneuver. The quality of the evidence for these results was low because they were small studies and vulnerable to bias from limitations in the study methods.

**Conclusions:** evidence-based guidance for PEEP level selection in preterm infants continues to be limited. We are unable to make recommendations for clinical practice based on our findings. This review should raise awareness of the lack of high-quality research evidence guiding the selection of PEEP levels in preterm infants and encourage further research. Additional research evaluating lung-recruitment maneuvers as an approach for individually selecting PEEP levels would be particularly valuable, given our findings of possible but uncertain benefit with this approach.

### **Ultrasound guidance for injecting local anaesthetics in children to block pain transmission**

Authors: Guay J, Suresh S, Kopp S

#### **Background**

A regional blockade involves injecting a local anaesthetic into the spine or around the nerves to block pain transmission. It can be used to replace general anaesthesia or to treat pain after surgery. Finding an effective alternative to traditional painkillers (pills or injections containing morphine derivatives) is particularly important for children, as they might be more likely to suffer adverse effects from opioid painkillers, and also because pain in early life might do long-term harm (exaggerated response to pain later in life). Traditionally, finding the exact location where the local anaesthetic needs to be injected was done on anatomical landmarks, that is palpation of bones or a pulsatile vessel (artery, using fingers to feel a pulse). Later, an electric needle producing a muscle contraction (nerve stimulator) was advocated as being more precise. Over the past four decades, clinicians have started to use ultrasound to locate nerves. However, ultrasound machines are expensive (USD 22,000 versus USD 1000 for a nerve stimulator).

We wanted to know if ultrasound guidance can improve the success rate and reduce the incidence of complications of regional blockade in children. These complications may include lasting neurological complications, inadvertent needle entry into a blood vessel, and seizure or cardiac arrest from local anaesthetic excess or from inadvertent injection into a blood vessel.

#### **Search date**

The evidence is current to March 2018.

#### **Study characteristics**

We included 33 well-designed studies with a total of 2293 children in which ultrasound guidance was compared with another method of nerve localization (traditional landmarks techniques or nerve stimulator) for regional blockade in children.

#### **Study funding sources**

Sources of funding included a government organization (two studies), a charitable organization (two studies), and an institutional department (13 studies). Two studies declared that they received industry help (equipment loan). The source of funding was unclear for 14 studies.

### **Key results**

Ultrasound guidance for regional blockade in children may decrease the occurrence of failed block. It may also increase duration of the block and reduce pain at one hour after surgery. Ultrasound guidance may decrease the number of needle passes required to perform the block. However, because the vast majority of blocks in children are performed with the child under deep sedation or general anaesthesia, the true value of this finding might be arguable. There were no major complications in the included trials. There may be little or no difference between study groups in risks of minor complications. Altogether, whether or not these findings justify the extra cost of ultrasound guidance should probably also take into account the anaesthesiologist's expertise and local resources. The five ongoing studies may alter the conclusions of the review once published and assessed.

### **Quality of the evidence**

We assessed the quality of the evidence as moderate for decreased occurrence of a failed block and improved pain scores at one hour; high for prolonged block duration; and very low for decreased number of needle passes.

### **Interventions for primary vesicoureteric reflux**

Authors: Williams G, Hodson EM, Craig JC

#### **What is the issue?**

Vesicoureteric reflux (VUR) is the backflow of urine from the bladder up the ureters to the kidney. People with VUR are thought to be more likely to get urinary tract infections (UTIs) involving the kidney tissue, which may cause permanent kidney damage. Current treatment options include surgical reimplantation of the ureters, long-term antibiotics, endoscopic correction by subureteric injection of a substance (injection into the bladder under the ureter), complementary medicines, or a combination of interventions

#### **What did we do?**

A literature search identified all randomised studies comparing different treatment options in children with vesicoureteric reflux. Results along with study design details were extracted and compiled. Studies comparing similar treatments and outcomes had data pooled to obtain an estimate of effect on outcomes such as repeat urinary tract infection with illness, urinary tract infection with fever and kidney damage.

### **What did we find?**

A total of 34 randomised studies, involving 4001 children were identified and underwent data extraction and analysis. The most frequent comparisons were for long-term, low-dose antibiotics with no treatment (8 studies) or placebo (4 studies) and antibiotics versus surgical reimplantation of ureters plus antibiotics (7 studies). Other treatments looked at endoscopic correction by injection compared with antibiotics (3 studies), different materials for endoscopic correction (2 studies) circumcision (1 study), probiotics (1 study), cranberry product (1 study), and oxybutynin (2 studies).

Meta-analysis of similar studies found that long-term low-dose antibiotic treatment compared with no treatment may lead to little or no difference in the risk for repeat UTIs in children with VUR. Associated side effects were infrequent and minor, but prophylaxis was associated with a threefold increased risk of bacterial resistance to the treatment drug in later infections. Surgery decreased the number of repeat UTIs with fever, but did not change the number of children developing UTI with illness or kidney damage. Many studies did not contribute to the meta-analysis as they failed to report relevant outcomes or were single studies examining a treatment option not used by other studies or combinations of treatments.

### **Conclusions**

Long-term low-dose antibiotic treatment in children with VUR makes little or no difference to the risk of repeat UTI causing a person to be unwell. Surgery may reduce the risk of repeat UTI with fever however this is based on two studies of 429 children who may not represent the majority and may not bear true in a more general group of children with VUR. Complementary therapies such as probiotics and cranberry were trialled in single or two studies and do not provide evidence of sufficient certainty to support or deny their use.

### **Psychological therapies for parents of children and adolescents with a longstanding or life-threatening physical illness**

Authors: Law E, Fisher E, Eccleston C, Palermo TM

#### **Bottom line**

We found that psychological therapies may improve parenting behavior for parents of children with cancer, chronic pain, diabetes or traumatic brain injury, and may improve mental health of parents of children with cancer or chronic pain. Cognitive-behavioral therapy (CBT) and problem-solving therapy (PST) are promising types of therapy. We were not able to answer questions about whether psychological therapies are helpful for parents of children with other medical conditions, or whether other types of therapy are helpful, because there were not enough data. Our findings may have been impacted by differences in measures used across

studies. New studies may change the results of this review, and so our findings should be interpreted cautiously.

## **Background**

We have updated our previously published review of psychological therapies for parents of children with a longstanding or life-threatening physical illness to include studies published through July 2018.

Parenting a child with a longstanding illness is challenging. Parents may have difficulty balancing caring for their child with other demands and can experience increased stress, sadness, or family conflict. Their children may have emotional or behavioral concerns. Parents can influence their child's adaptation to living with their medical condition. Psychological therapies for parents provide training in skills to modify emotions or behaviors that aim to improve parent, child, and family well-being.

We wanted to understand whether psychological therapies are helpful for parents of children and adolescents (up to age 19) with longstanding illness. We included studies of interventions that were predominantly psychological and delivered to parents compared with non-psychological treatment, treatment as usual, or wait-list. Outcomes were parenting behavior (e.g. protective behaviors), parent mental health, child behavior/disability, child mental health, child medical symptoms, family functioning, and side effects.

## **Key results**

We added 21 new studies in this update and we removed 23 studies that no longer met our inclusion criteria, resulting in 44 randomized controlled trials (randomized controlled trials, where participants are assigned randomly to either one treatment or a different treatment or no treatment, provide the most reliable evidence) with a total of 4697 participants (average child age = 11 years). The length of the studies ranged from one day to 24 months. Studies included children with asthma (4), cancer (7), chronic pain (recurrent or persistent pain for more than three months, including two studies of children with inflammatory bowel disease (15)), diabetes (15), skin diseases (1), and traumatic brain injury (3); one study included children with eczema and children with asthma. Therapy types included CBT (21), family therapy (4), motivational interviewing (3), multisystemic therapy (4), and PST (12). Funding sources included federal and local governments, hospitals, universities, and foundations.

We found that parenting behavior improved in studies of children with cancer, chronic pain, diabetes, and traumatic brain injury immediately after treatment, which continued long-term for parents of children with cancer and chronic pain. Parent mental health improved in studies of children with cancer and chronic pain immediately after treatment, which continued long-term. Parent mental health did not improve in studies of children with diabetes. We found that CBT and PST improved parenting behavior immediately after treatment,

which continued long-term. PST also improved parent mental health immediately after treatment and long-term, but CBT did not. We could not evaluate whether the other types of psychological therapy were beneficial for parents due to insufficient data. We found that these treatment effects were generally small. We found that most studies (32 studies) did not report on whether side effects occurred. In the few studies that did, none of the participants experienced side effects from psychological therapy.

### **Quality of evidence**

We rated the quality of the evidence from studies using four levels: very low, low, moderate, or high. Very low-quality evidence means that we are very uncertain about the results. High-quality evidence means that we are very confident in the results. There were not enough data to answer some parts of our review questions. There was sufficient evidence (low to moderate quality) to reach some conclusions about the effects of psychological therapy for parents of children with cancer and chronic pain and the effects of CBT and PST.

If you have any questions or comments with regard to the above document please feel free to contact me.

Kind regards

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