



# **PEDIATRIC SURGERY Update** ©

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### **Duhamel Procedure**

In 1956 Bernard Duhamel first described a rectorectal pull-through procedure. Since then, the Duhamel is a long standing pull-through procedure performed for the management of Hirschsprung's disease (HD). In short, the procedure entails pulling the proximal normal ganglionic bowel posterior to the aganglionic rectum through the presacral space into the anus. A common lumen is created with mechanical devices between the ganglionic and aganglionic rectal bowel. The surgical approach to HD has changed from building an initial temporary colostomy using a two or even three stage procedures, to a one-stage surgical procedure in the neonatal period. As with any other kind of surgical procedure for Hirschsprung's disease the child can develop postoperative constipation, soiling or incontinence. Constipation and soiling after the Duhamel procedure often are associated with an anterior rectal pouch caused by a colorectal spur. Constipation also may result from outlet obstruction caused by residual spasticity of the internal sphincter or too long rectal aganglionic bowel. Extended resection of the aganglionic rectum reduces the incidence of fecalomas formation. Suboptimal outcome after operation for Hirschsprung's disease includes associated neuronal intestinal dysplasia, total colonic involvement, significant neurological impairment and history of enterocolitis all of which may result in abnormal colonic motility in the remaining ganglionic bowel. Chronic bleeding after Duhamel is caused by an incomplete section of the septum between rectum and pull-through segment leaving the feeding artery on the tip of the side-to-side anastomosis. After rectosigmoidectomy alteration in bladder function such as increase bladder capacity and urinary residual has been described. Open and laparoscopic Duhamel procedure has similar outcomes.

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## Prevention of NEC

Necrotizing enterocolitis (NEC) is the most common surgical emergency in the neonatal intensive care unit (NICU) associated with a significant morbidity and mortality. Due to advances in neonatal care survival among premature and low birth weight infants has improved though the mortality due to NEC has increased. Prevention of NEC should be of utmost importance in most NICU. One of the most important preventive measures in the development of NEC is feeding infants at risk with breast milk as opposed to formula milk. If fortification of breast milk is necessary to achieve adequate growth, then a fortifier based on human milk lowers the incidence of NEC. Another factor associated with lowering the incidence of NEC is whether to use early or delayed enteral feedings. Current metaanalysis does not support the use of a delayed introduction or slower rate of enteral feeds to prevent NEC. They slower the weight gain and take longer time to full feeding. Adverse effect of immunoglobulin administration or prophylactic enteral antibiotics precluded their use as preventive measure. Prophylactic antibiotics increase the colonization of resistant bacteria. The other measure with strong evidence to use for NEC prevention is the administration of probiotics and modulation of feeding regimens in infants at high risk. Studies investigating specific components of breast milk and probiotics responsible for these protective effects have identified several molecules with therapeutic potential such as erythropoietin, glutamine, and epidermal growth factor all of which strengthen the gut barrier. Probiotics reduce intestinal permeability, promote peristalsis, increase mucin secretion, activate anti-inflammatory TLR9, downregulate proinflammatory cytokines and upregulated antiinflammatory mediators.

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## Music-Induced Stress Reduction

Music intervention has been found to reduce procedure related anxiety for patients in the pre- and intraoperative setting. Studies have shown that music reduced self-reported

stress levels and improve perceptions of patient-oriented service in visitors to the surgery/intensive care unit waiting room. Adults who listened to music while waiting with their children in the pediatric emergency department, reported lower anxiety level than those who did not listen to music. The level of formal education is inversely correlated to degree of music-induced anxiety reduction. Music improved the work environment for hospital staff and facilitated their interactions with friends and family of patients. Allowing patients control over music selection and providing uninterrupted time for music listening gives the patients an enhanced sense of control in an environment that often controls them. Music alone and music assisted relaxation techniques significantly decreased arousal due to stress. Further analysis revealed that the amount of stress reduction was significantly different when considering age, type of stress, music assisted relaxation technique, musical preference, previous music experience, and type of intervention. Music specifically induces an emotional response similar to a pleasant experience or happiness. Music in the operating room has immeasurable effects. It can prevent distraction, minimize annoyance, reduce stress, reduce the demands for analgesic and anesthetics, and diminish the anxiety of patients, staff and users.

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