# Appendix K

## Tables of excluded studies

### Key Components of the History Taking and the Physical Examination in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Van Den Berg et al. Epidemiology of childhood constipation: A systematic review. 2006. American Journal of Gastroenterology 101[10], 2401-2409United States. | No experimental data |
| Waseem et al. Megacolon: Constipation or volvulus? 2006. Pediatric Emergency Care 22[5], 346-348United States. | 1 single case control study |
| Skowronska-Piekarska et al. The importance of the history taking procedure in the assessment of clinical meaning of constipation symptoms. 2007. Gastroenterologia Polska 14[4], 265-269Poland. | Mainly adult population (Mean 47.7 years for women) and all men over 45 years. |
| Chan et al. Influence of positive family history on clinical characteristics of functional constipation. 2007. Clinical Gastroenterology and Hepatology 5[2], 197-200 | Adult population |
| Stordal et al. Organic abnormalities in recurrent abdominal pain in children. 2001. Acta Paediatrica 90[6], 638-642 | Prospective case series, no comparison group. No details of the history taking elements reported |
| Voskuijl et al. Use of Rome II criteria in childhood defecation disorders: applicability in clinical and research practice. 2004. Journal of Pediatrics 145[2], 213-217 | Prospective case series, no comparison group. Comparison between 2 sets of diagnostic criteria previously defined by expert consensus applied to the same group of children |
| Loening-Baucke. Functional fecal retention with encopresis in childhood. 2004. Journal of Pediatric Gastroenterology and Nutrition 38[1], 79-84 | Retrospective case series, no comparison group. Comparison between 2 sets of diagnostic criteria previously defined by expert consensus applied to the same group of children |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Klijn et al. The diameter of the rectum on ultrasonography as a diagnostic tool for constipation in children with dysfunctional voiding. 2004. Journal of Urology 172[5 Pt 1], 1986-1988 | Case control study concerned with the diagnostic value of the abdominal ultrasound. Clinical data poorly reported, no analysis conducted comparing the 2 study groups |
| Joensson et al. Transabdominal ultrasound of rectum as a diagnostic tool in childhood constipation. 2008. Journal of Urology 179[5], 1997-2002 | Case control study concerned with the diagnostic value of the abdominal ultrasound. Detailed analysis of comparing clinical data in constipated children with healthy controls not performed. Constipation diagnosed by using a set of diagnostic criteria previously defined by expert consensus |
| Barr et al. Chronic and occult stool retention: a clinical tool for its evaluation in school-aged children. 1979. Clinical Pediatrics 18[11], 674-679 | Case control study concerned with the diagnostic value of the plain abdominal radiography. Detailed analysis of comparing clinical data in constipated children with non constipated controls not performed. Constipation diagnosed by using a set of diagnostic criteria previously defined by expert consensus |
| Giramonti et al. The association of constipation with childhood urinary tract infections. 2005. Journal of Pediatric Urology 1[4], 273-278United Kingdom. | Case control study concerned with the relationship between a history of constipation, faecal loading on X-rays and a history of UTIs in an office practice Detailed analysis of comparing clinical data in constipated children with non constipated controls not performed. Unclear what criteria were used to diagnose constipation |
| Beckmann et al. Accuracy of clinical variables in the identification of radiographically proven constipation in children. 2001. Wisconsin Medical Journal 100[1], 33-36United States. | Elements of the history/physical examination analysed in the study were very limited (1 for history and 2 for physical examination apart for the digital rectal examination). The 2 elements of the physical examination contributed to exclude a surgical cause of abdominal pain, but not to establish a positive diagnosis of idiopathic constipation. This study might be relevant for the review on the diagnostic value of the digital rectal examination |
| Rockney et al. The plain abdominal roentgenogram in the management of encopresis. 1995. Archives of Pediatrics and Adolescent Medicine 149[6], 623-627 | There is no comparison between constipated and non constipated children, but between 2 groups of children both of whom presented with soiling. This study might be relevant for the review on the diagnostic value of the digital rectal examination as a means of assessing faecal retention |

## Diagnostic Value of Digital Rectal Examination (DRE) in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Authors: Moeller Joensson I;Siggaard C;Rittag S;Hagstroem S;Djurhuus JC;. Title: Transabdominal Ultrasound of Rectum as a Diagnostic Tool in Childhood Constipation. Journal Name: Journal of Urology. Year: 2008 | The study is about Transabdominal Ultrasound of Rectum and although a comparison with DRE is made, there are not specific data reported on the later one |
| Authors: Eidlitz-Markus T;Mimouni M;Zeharia A;Nussinovitch M;Amir J;. Title: Occult constipation: A common cause of recurrent abdominal pain in childhood. Journal Name: Israel Medical Association Journal. Year: 2004 | Data on the incidence of overt/occult constipation diagnosed by DRE in children with recurrent abdominal pain are reported, but there are no specific data on the diagnostic value of DRE |
| Authors: Gold DM;Levine J;Weinstein TA;Kessler BH;Pettei MJ;. Title: Frequency of digital rectal examination in children with chronic constipation. Journal Name: Archives of Pediatrics and Adolescent Medicine. Year: 1999 Apr | Paper reports frequency of performance of DRE by primary care practitioners. Incidence of different conditions after DRE was performed in hospital is reported. Impact of these conditions on therapy is also discussed. However there are no specific data on the diagnostic value of DRE |
| Authors: Greenberg LW;. Title: The rectal examination. A reminder of its importance. Journal Name: Clinical Pediatrics. Year: 1974 Dec | Brief clinical note. Some figures related to the frequency of DRE performed in children with abdominal pain at a hospital clinic are reported but there are no specific data on the diagnostic value of the DRE |
| Authors: Raahave D;Loud FB;. Title: Additional faecal reservoirs or hidden constipation: a link between functional and organic bowel disease. Journal Name: Danish Medical Bulletin. Year: 2004 Nov | Adult population<br>Female's mean age 49.9 (17-85)<br>Male's mean age 51.7 (24-89) |
| Authors: Safder S;Rewalt M;Elitsur Y;. Title: Digital rectal examination and the primary care physicians: a lost art?. Journal Name: Clinical Pediatrics. Year: 2006 Jun | Paper compares the frequency of performance of DRE by primary care practitioners and hospital specialists. Incidence of different conditions after DRE was performed is reported but there are no specific data on the diagnostic value of the DRE |
| Authors: Scholer SJ;Pituch K;Orr DP;Dittus RS;. Title: Use of the rectal examination on children with acute abdominal pain. Journal Name: Clinical Pediatrics. Year: 1998 | Paper reports frequency of performance of DRE in children with acute abdominal pain by general paediatricians and factors associated with performing a DRE. Incidence of different conditions after DRE was performed is reported, but there are no specific data on the diagnostic value of the DRE. |
| Authors: van der Plas RN;Benninga MA;Staalman CR;Akkermans LM;Redekop WK;Taminiau JA;Buller HA;. Title: Megarectum in constipation. Journal Name: Archives of Disease in Childhood. Year: 2000 Jul | DRE was used in the diagnosis of faecal impaction, but no further data are provided. Study reported data on<br>radiological studies and anorectal manometry instead |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Authors: Voskuijl WP;Heijmans J;Heijmans HS;Taminiau JA;Benninga MA;. Title: Use of Rome II criteria in childhood defecation disorders: applicability in clinical and research practice.. Journal Name: Journal of Pediatrics. Year: 2004 Aug | Some data on incidence on faecal retention as diagnosed by DRE in a group of children presenting with constipation and/or encopresis. No further details provided |
| Authors: Zeiter DK;Hyams JS;. Title: Pediatric abdominal pain: What to look for in the workup. Journal Name: Consultant. Year: 1997 | Overview of common GI causes of recurrent abdominal pain in infants and children. No specific data on DRE are reported |

## Prevalence of Coeliac Disease and Hypothyroidism in Children with Chronic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Biggs et al. Evaluation and treatment of constipation in infants and children. 2006. American Family Physician 73[3], 469-477 | Non systematic review. No relevant data on prevalence of hypothyroidism. References checked. |
| Milla. The pathophysiology of constipation. 2007. Annales Nestle 65[2], 55-61Switzerland. | Discussion paper. No relevant data on prevalence of hypothyroidism. References checked. |
| Silverberg et al. Pediatric gastroenterology. A review. 1970. Gastroenterology 58[2], 229-252 | Non systematic review. No relevant data on prevalence of coeliac disease. References checked. |
| Sauvat. Diagnosis of constipation in children. 2007. Annales Nestle 65[2], 63-71Switzerland. | Discussion paper. No relevant data on prevalence of coeliac disease. References checked. |
| Ashorn. Gastrointestinal diseases in the paediatric age groups in Europe: Epidemiology and impact on healthcare. 2003. Alimentary Pharmacology and Therapeutics, Supplement 18[3], 80-83United Kingdom. | Discussion paper. No relevant data on prevalence of coeliac disease. References checked. |
| Kokkonen et al. Gastrointestinal complaints and diagnosis in children: A population-based study. 2004. Acta Paediatrica 93[7], 880-886Norway. | Cross sectional, population based study. No relevant data on prevalence of coeliac disease in children with constipation |
| Valicenti-McDermott et al. Gastrointestinal Symptoms in Children with an Autism Spectrum Disorder and Language Regression. 2008. Pediatric Neurology 39[6], 392-398United States. | Cross sectional study. No relevant data on prevalence of coeliac disease in children with constipation |
| Tully. Pediatric celiac disease. 2008. Gastroenterology Nursing 31[2], 132-140 | Discussion paper. No relevant data on prevalence of coeliac disease. References checked. |
| Michaud. [Unusual forms of presentation of primary hypothyroidism]. [Spanish]. 1987. Revista Medica de Chile 115[9], 872-880 | Paper in Spanish |
| Lloyd-Still. Constipation in children. 1977. Comprehensive Therapy 3[9], 35-39 | Discussion paper. No relevant data on prevalence of hypothyroidism. References checked. |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Dinari et al. Constipation as a presenting symptom in childhood-a diagnostic problem. 1981. American Journal of Proctology, Gastroenterology and Colon and Rectal Surgery 32[1], 16-17 | 4 case reports, only one with coeliac disease |
| McNicholl et al. Infancy celiac disease without diarrhea. 1972. Pediatrics 49[1], 85-91 | 3 case reports: children presetting with failure to thrive, anorexia, vomiting and verifying degrees of constipation. Sample intentionally selected for descriptive purposes, not possible to calculate prevalence |
| Khan et al. Functional childhood constipation: A practical approach. 1999. Practical Gastroenterology 23[12], 16-34United States. | Discussion paper. No relevant data on prevalence of hypothyroidism. References checked. |
| DeBoer et al. Differential presentation for children with autoimmune thyroiditis discovered because of symptom development or screening. 2008. Journal of Pediatric Endocrinology and Metabolism 21[8], 753-761Israel. | Low quality study, retrospective cohort. Not possible to perform our own calculations to make sense of the data for the purpose of our review as there are missing data not accounted for and therefore it is unclear how many children were euthyroid and how many had subclinical/overt hypothyroidism |

## Diagnostic value of the Anorectal Manometry in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Poisson et al. Severe chronic constipation as a surgical problem. 1983. Surgical Clinics of North America 63[1], 193-217 | Non systematic review paper |
| De et al. Symptomatology, pathophysiology, diagnostic work-up, and treatment of Hirschsprung disease in infancy and childhood. 2007. Current Gastroenterology Reports 9[3], 245-253United Kingdom. | Non systematic review paper |
| Chumpitazi et al. Pediatric gastrointestinal motility disorders: Challenges and a clinical update. 2008. Gastroenterology and Hepatology 4[2], 140-148United States. | Non systematic review paper |
| Meunier et al. Physiologic investigation of primary chronic constipation in children: comparison with the barium enema study. 1984. Gastroenterology 87[6], 1351-1357 | Patients with Hirschsprung's disease were excluded. No biopsies were performed |
| Yoshino et al. Anal ultraslow waves and high anal pressure in childhood: a clinical condition mimicking Hirschsprung disease. 2007. Journal of Pediatric Surgery 42[8], 1422-1428 | Research paper on a condition not included in the guideline scope |
| Shandling et al. The anal sphincter force in health and disease. 1987. Journal of Pediatric Surgery 22[8], 754-757 | No patients with Hirschsprung's disease were included |
| Zhang et al. Diagnosis and surgical treatment of isolated hypoganglionosis. 2008. World Journal of Pediatrics 4[4], 295-300United States. | No patients with idiopathic constipation were included |
| Sayyari et al. Role of anorectal manometry to improve the results of biopsy in diagnosis of chronic constipation. 2007. Pakistan Journal of Medical Sciences 23[5], 689-691Pakistan. | Authors acknowledged one of the limitations of the study was that only patients with a positive manometry result underwent biopsy. In fact, the way outcomes are reported look like children whose biopsy was positive to Hirschsprung's disease had a manometry afterwards |
| el-Shafie et al. A simplified method of anorectal manometry for wider clinical application. 1972. Journal of Pediatric Surgery 7[2], 230-235 | Outcomes are not clearly reported. Biopsies were not obtained from all patients even when manometry was not normal and it was not explained why |
| Nagasaki et al. Radiologic diagnosis of Hirschsprung's disease utilizing rectosphincteric reflex. 1984. Pediatric Radiology 14[6], 384-387Germany. | Histological diagnosis of HD was known before manometry was performed |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Mishalany et al. Chronic constipation. Manometric patterns and surgical considerations. 1984. Archives of Surgery 119[11], 1257-1259 | Unclear on what basis some patients underwent biopsies whilst others did not. Data are poorly reported and it is difficult to establish a correlation between the result of the manometry and the biopsy |
| Yokoyama et al. Problems in diagnosis of Hirschsprung's disease by anorectal manometry. 1989. Progress in Pediatric Surgery 24, 49-58 | Results are poorly reported. In 29 children diagnosed with HD the result of the rectal biopsy was known at the time of manometry |
| Iwai et al. Reliability of anorectal manometry in the diagnosis of Hirschsprung's disease. 1988. Zeitschrift fur Kinderchirurgie 43[6], 405-407 | Unclear how many patients underwent biopsy and how the results of manometry influenced the decision to perform biopsy. 3 children were diagnosed with HD as confirmed by rectal biopsy. The RAIR had been equivocal in one but in the other 2 the authors reported there was a "false presence". Since this can only be said after knowing the result of the biopsy it is unclear whether the RAIR was actually present in the first place, and if it was, why only these 2 children underwent biopsy and not the others in whom the RAIR was also positive. |
| Ikawa et al. Acetylcholinesterase and manometry in the diagnosis of the constipated child. 1986. Archives of Surgery 121[4], 435-438 | Unclear how the results of manometry influenced the decision to perform biopsy. 26/261 children were diagnosed with HD as confirmed by rectal biopsy. 2 of these children did not cooperate with manometry in the first place. The RAIR was not present in 23 of them but in the other child the authors reported there was a "false positive" result in manometry". Since this can only be said after knowing the result of the biopsy it is unclear whether the RAIR was actually present in the first place, and if this was the case, why only this child underwent biopsy and not the others in whom the RAIR was also positive. There are missing data from 8 biopsies not accounted for |
| Ito et al. Maturation of the rectoanal response in premature and perinatal infants. 1977. Journal of Pediatric Surgery 12[3], 477-482 | Outcomes not reliable. Of 35 children with "normal manometric response" only 20 underwent biopsy and it is unclear why. 4 of these children had no ganglion cells on superficial biopsy but were treated conservatively because according to the authors "the rectoanal response had such a normal contour" Apparently symptoms were "resolved" in these children |
| Vela et al. Anorectal manometry: a new simplified technique. 1982. American Journal of Gastroenterology 77[7], 486-490 | Unclear how the results of manometry influenced the decision to perform biopsy: of 40 children with "normal manometric response" only 7 underwent biopsy but no further explanation was provided |
| Rosenberg et al. A new simplified technique for pediatric anorectal manometry. 1983. Pediatrics 71[2], 240-245 | Unclear how the results of manometry influenced the decision to perform biopsy: of 69 children with "normal anorectal reflexes" only 9 underwent biopsy but no further explanation was provided |
| Loening-Baucke. Anorectal manometry: experience with strain gauge pressure transducers for the diagnosis of Hirschsprung's disease. 1983. Journal of Pediatric Surgery 18[5], 595-600 | Only patients in whom the RAIR was not present underwent rectal biopsy |
| Reid et al. The barium enema in constipation: comparison with rectal manometry and biopsy to exclude Hirschsprung's disease after the neonatal period. 2000. Pediatric Radiology 30[10], 681-684 | Only 14 children underwent both manometry and biopsy, 6 of them because they had barium enemas consistent with HD, but it is unclear what the indication in the other 8 cases was. It is unclear what was the order in which investigations were carried out |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Noviello et al. Role of anorectal manometry in children with severe constipation. 2009. Colorectal Disease 11[5], 480-484United Kingdom. | Only patients in whom the RAIR was not present, uncooperative patients and patients with RAIR present but poor response to clinical treatment (n=2) underwent rectal biopsy |

## Diagnostic Value of Abdominal Radiography, Abdominal Ultrasound and Transit Studies Time in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Centre for Reviews and Dissemination. Diagnostic value of abdominal radiography in constipated children: a systematic review (Structured abstract). 2008. Database of Abstracts of Reviews of Effects [2] | Structured abstract of a systematic review already included this review |
| Eidlitz-Markus et al. Occult constipation: A common cause of recurrent abdominal pain in childhood. 2004. Israel Medical Association Journal 6[11], 677-680Israel. | No pre-diagnosis was reported. Not clear why some patients underwent X-rays in the first place if their clinical diagnosis of constipation was "overt constipation" according to the authors' definition. Not clear why some children who already had a diagnosis of "occult constipation by DRE according to the authors definition, undergo X-rays subsequently. Lack of control group |
| Afzal et al. Constipation with acquired megarectum in children with autism. 2003. Pediatrics 112[4], 939-942 | Poor methodological paper. No data on diagnostic value were reported: symptoms of constipation not clearly related to the outcomes of a plain abdominal radiography. Faecal impaction no clinically defined. |
| El-Salhy. Chronic idiopathic slow transit constipation: pathophysiology and management. 2003. Colorectal Disease 5[4], 288-296 | Review paper. No specific diagnostic data on transit time, but on pathophysiology of chronic idiopathic slow transit constipation. |
| Hutson et al. Chronic constipation: No longer stuck! Characterization of colonic dysmotility as a new disorder in children. 2004. Journal of Pediatric Surgery 39[6], 795-799United States. | Review paper. Some diagnostic data on CTT from study already included |
| Bouchoucha et al. Colonic response to food in constipation. 2006. International Journal of Colorectal Disease 21[8], 826-833 | Population age not reported. No explicit references to children |
| Zarate et al. In patients with slow transit constipation, the pattern of colonic transit delay does not differentiate between those with and without impaired rectal evacuation. 2008. American Journal of Gastroenterology 103[2], 427-434 | Age range 18-73 years. (mean 41 years) |
| van der Plas et al. Megarectum in constipation. 2000. Archives of Disease in Childhood 83[1], 52-58 | The study did not use plain abdominal radiography, but abdominal radiography after a barium enema in order to measure the recto-pelvic ratio (RPR) |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Guo et al. Categorization of dysmotility in patients with chronic constipation and its significance for management. 2004. Chinese Journal of Digestive Diseases 5[3], 98-102 | Age range 16-82 years (mean 44 years) |
| McLean et al. The utilization of colon transit scintigraphy in the diagnostic algorithm for patients with chronic constipation. 1999. Digestive Diseases and Sciences 44[1], 41-47 | Age >18 years |
| O'Brien et al. Motility and tone of the left colon in constipation: a role in clinical practice? 1996. American Journal of Gastroenterology 91[12], 2532-2538 | Age range 16-74 years (mean >33) |
| Pemberton et al. Evaluation and surgical treatment of severe chronic constipation. 1991. Annals of Surgery 214[4], 403-411 | Mean age > 33 years |
| Fink et al. The role of manometry, electromyography and radiology in the assessment of intractable constipation. 1992. Australian and New Zealand Journal of Surgery 62[12], 959-964 | Age range 15-75 (mean 41.3 years) |
| Eising et al. Differentiation of prolonged colonic transit using scintigraphy with indium-111-labeled polystyrene pellets. 1998. Journal of Nuclear Medicine 39[6], 1062-1066 | Age range 8-68 years (mean 41.7 years) |
| Marcovitch. Colonic transit times and behaviour profiles in children with defecation disorders. 2004. Archives of Disease in Childhood 89[1], 2United Kingdom. | Commentary paper |
| Christensen et al. Scintigraphic assessment of retrograde colonic washout in fecal incontinence and constipation. 2003. Diseases of the Colon and Rectum 46[1], 68-76 | Age range 10-80 years (median 46 years) |
| Wexner et al. Colorectal physiological tests: use or abuse of technology? 1994. European Journal of Surgery 160[3], 167-174 | Age range 12-85 years (mean 64 years in women and 60 in men) |
| Bouchoucha et al. Error analysis of classic colonic transit time estimates. 2000. American Journal of Physiology - Gastrointestinal and Liver Physiology 279[3], G520-G527 | Age range 17-80 years (mean 45.3 years) (all control subjects >18 years) |
| Glia et al. Clinical value of symptom assessment in patients with constipation. 1999. Diseases of the Colon and Rectum 42[11], 1401-1410United States. | Age range 17-79 years (median 52 years) |
| Halverson et al. Which physiologic tests are useful in patients with constipation? 1998. Diseases of the Colon and Rectum 41[6], 735-739 | Age range 16-78 years (mean 48 years) |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Ducrotte et al. Colonic transit time of radiopaque markers and rectoanal manometry in patients complaining of constipation. 1986. Diseases of the Colon and Rectum 29[10], 630-634 | Population > 18 years |
| Bassotti et al. Anorectal manometric abnormalities and colonic propulsive impairment in patients with severe chronic idiopathic constipation. 1994. Digestive Diseases and Sciences 39[7], 1558-1564 | Population > 18 years |
| Chaussade et al. Determination of total and segmental colonic transit time in constipated patients. Results in 91 patients with a new simplified method. 1989. Digestive Diseases and Sciences 34[8], 1168-1172 | Population > 18 years |
| Glia et al. Quality of life in patients with different types of functional constipation. 1997. Scandinavian Journal of Gastroenterology 32[11], 1083-1089 | Age range 17-79 years (median 53 years) |
| Charles et al. Scintigraphy of the whole gut: clinical evaluation of transit disorders. 1995. Mayo Clinic Proceedings 70[2], 113-118 | Population > 18 years |
| Nurko. What's the value of diagnostic tools in defecation disorders? 2005. Journal of Pediatric Gastroenterology and Nutrition 41[SUPPL. 1], S53-S55United States. | Review paper |
| Clarke et al. Quality of life in children with slow transit constipation. 2008. Journal of Pediatric Surgery 43[2], 320-324 | Not related to diagnostic value of colonic transit time. might be included in further review on quality of life |
| Wald et al. Psychological and physiological characteristics of patients with severe idiopathic constipation. 1989. Gastroenterology 97[4], 932-937 | Age range 16-78 years (mean>31 years) |
| Wald. Colonic transit and anorectal manometry in chronic idiopathic constipation. 1986. Archives of Internal Medicine 146[9], 1713-1716 | Age range 13-68 years (mean>32 years) |
| Watier et al. Constipation with colonic inertia. A manifestation of systemic disease? 1983. Digestive Diseases and Sciences 28[11], 1025-1033 | Age range 12-76 years (mean not reported). No subgroups analysis done, no explicit references to children data. |
| Bannister et al. Physiological studies in young women with chronic constipation. 1986. International Journal of Colorectal Disease 1[3], 175-182 | Age range 14-53 years (mean 32 years) |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Cayan et al. The assessment of constipation in monosymptomatic primary nocturnal enuresis. 2001. International Urology and Nephrology 33[3], 513-516 | Poor quality study. Not blinded, exclusion criteria unclear. No data on ultrasound. Some data on abdominal X-ray but better quality studies already included in the review |
| Dimson. Transit time related to clinical findings in children with recurrent abdominal pain. 1971. Pediatrics 47[4], 666-674 | Use of carmine instead of radioisotope/radiopaque markers to estimate transit time |
| Dimson. Carmine as an index of transit time in children with simple constipation. 1970. Archives of Disease in Childhood 45[240], 232-235 | Use of carmine instead of radioisotope/radiopaque markers to estimate transit time |
| Shankar et al. Colonic Transit Time - What Is Normal? 2004. Journal of Pediatric Surgery 39[2], 166-169United States. | Transit time with radiopaque markers conducted in healthy children only with the purpose of contributing normal values |
| Allen et al. Evaluation of constipation by abdominal radiographs correlated with treatment outcome in children with dysfunctional elimination. 2007. Urology 69[5], 966-969 | Radiologic findings not related to symptoms of constipation |
| Orno et al. Sonographic visualization of the rectoanal inhibitory reflex in children suspected of having Hirschsprung disease: a pilot study. 2008. Journal of Ultrasound in Medicine 27[8], 1165-1169 | Pilot study on trans-perineal ultrasound |

**The following studies were not reviewed individually as they were already included in the following systematic review on abdominal radiography:**
Reuchlin-Vroklage et al. Diagnostic value of abdominal radiography in constipated children: a systematic review. 2005. Archives of Pediatrics and Adolescent Medicine 159[7], 671-678

| | |
|---|---|
| Barr et al. Chronic and occult stool retention: a clinical tool for its evaluation in school-aged children. 1979. Clinical Pediatrics 18[11], 674-679 | Already included in the systematic review |
| Leech et al. Evaluation of a method of assessing faecal loading on plain abdominal radiographs in children. 1999. Pediatric Radiology 29[4], 255-258 | Already included in the systematic review |
| Rockney et al. The plain abdominal roentgenogram in the management of encopresis. 1995. Archives of Pediatrics and Adolescent Medicine 149[6], 623-627 | Already included in the systematic review |
| Beckmann et al. Accuracy of clinical variables in the identification of radiographically proven constipation in | Already included in the systematic review |

| | |
|---|---|
| children. 2001. Wisconsin Medical Journal 100[1], 33-36United States. | |
| Blethyn et al. Radiological assessment of constipation. 1995. Archives of Disease in Childhood 73[6], 532-533 | Already included in the systematic review |

## Diagnostic value of Rectal Biopsy in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Santos et al. Study of acetylcholinesterase activity in rectal suction biopsy for diagnosis of intestinal dysganglionoses: 17-Year experience of a single center. 2008. Pediatric Surgery International 24[6], 715-719Germany. | Clinical data poorly reported |
| Montedonico et al. Histochemical staining of rectal suction biopsies as the first investigation in patients with chronic constipation. 2008. Pediatric Surgery International 24[7], 785-792 | Clinical data poorly reported |
| Nofech-Mozes et al. Difficulties in making the diagnosis of Hirschsprung disease in early infancy. 2004. Journal of Paediatrics and Child Health 40[12], 716-719Australia. | Small sample size, weak study design: 3 case studies |
| Polley et al. Suction rectal biopsy in the diagnosis of Hirschsprung's disease and chronic constipation. 1986. Pediatric Surgery International 1[2], 84-89Germany. | No clinical data |
| Iwai et al. Reliability of anorectal manometry in the diagnosis of Hirschsprung's disease. 1988. Zeitschrift fur Kinderchirurgie 43[6], 405-407 | Study on anorectal manometry, no useful data on rectal biopsy |
| Tomita et al. Histological studies on Hirschsprung's disease and its allied disorders in childhood. 2004. Hepato-gastroenterology 51[58], 1042-1044 | No clinical data |
| Simpson et al. Surgical evaluation and management of refractory constipation in older children. 1996. Journal of Pediatric Surgery 31[8], 1040-1042 | Clinical data poorly reported. No analysis of correlation between clinical data and histological diagnosis |
| Mishalany et al. Chronic constipation. Manometric patterns and surgical considerations. 1984. Archives of Surgery 119[11], 1257-1259 | Scant clinical data. No comparison made between groups. 80 patients: 3 segmental dilatation of colon, 4 Hirschsprung's disease, 73 with radiologically dilated anorectum + impaction, but 49 biopsies all normal in the latter group |
| Ikawa et al. Acetylcholinesterase and manometry in the diagnosis of the constipated child. 1986. Archives of Surgery 121[4], 435-438 | No clinical data |
| MacMahon et al. Hirschsprung-like syndromes in patients with normal ganglion cells on suction rectal biopsy. 1981. Journal of Pediatric Surgery 16[6], 835-839 | Small sample size, weak study design: 3 case studies |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Anupama et al. Ten-year experience in the management of total colonic aganglionosis. 2007. Journal of Pediatric Surgery 42[10], 1671-1676United States. | Case series, no comparison group. Population not relevant to the guideline: 25 children with total colonic aganglionosis chosen from a series of 831 children with Hirschsprung's disease |
| Ito et al. Maturation of the rectoanal response in premature and perinatal infants. 1977. Journal of Pediatric Surgery 12[3], 477-482 | No clinical data |
| Bonham et al. A 7-year study of the diagnostic value of rectal mucosal acetylcholinesterase measurement in Hirschsprung's disease. 1987. Journal of Pediatric Surgery 22[2], 150-152United States. | Scant clinical data |
| Weintraub et al. A simplified approach to diagnostic rectal biopsy in infants and children. 1977. American Journal of Surgery 134[2], 307-310 | Clinical data poorly reported |
| Kurer et al. Suction biopsy in Hirschsprung's disease. 1986. Archives of Disease in Childhood 61[1], 83-84United Kingdom. | No clinical data |
| Momoh. Short-segment Hirschsprung's disease. 1988. Tropical Doctor 18[1], 16-19United Kingdom. | Histological findings not reported in correlation with clinical variables |
| Bagdzevicius et al. Experience of acetylcholinesterase histochemistry application in the diagnosis of chronic constipation in children. 2007. Medicina 43[5], 376-384 | Clinical data poorly reported |
| Wheatley et al. Hirschsprung's disease in adolescents and adults. 1990. Diseases of the Colon and Rectum 33[7], 622-629 | 5 case studies: 2 adolescents and 3 adults |
| Barr et al. Clinical evaluation of the histochemical diagnosis of Hirschsprung's disease. 1985. Gut 26[4], 393-399 | Not possible to establish correlation between clinical presentation and histological findings |
| Low et al. Accuracy of anorectal manometry in the diagnosis of Hirschsprung's disease. 1989. Journal of Pediatric Gastroenterology and Nutrition 9[3], 342-346 | 45 patients had concordant results (both on manometry and biopsy) and only those were included in the analysis for clinical features, but it is unclear why. 4 patients with rectal biopsies showing aganglionosis but negative manometry were excluded, considering rectal biopsy is the gold standard to diagnose HD this introduces bias in the study. |
| Wendelschafer-Crabb et al. Mucosal nerve deficiency in chronic childhood constipation: a postmigration defect? 2009. Journal of Pediatric Surgery 44[4], 773-782United States. | No clinical data reported |
| Yadav et al. Hirschsprung's disease: is there a relationship between mast cells and nerve fibers? 2009. World Journal of Gastroenterology 15[12], 1493-1498 | No clinical data reported |

## Effectiveness of Pharmacological and Surgical Interventions for Disimpaction and Maintenance in Children with Chronic Idiopathic Constipation (including Adverse Effects of the Medium- and Long-term use of Laxatives)

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Afzal et al. Constipation with acquired megarectum in children with autism. 2003. Pediatrics 112[4], 939-942 | Health Economics outcomes. Clinical outcomes from individual studies already included in review |
| Eiland et al. Evaluating the off-label use of medications in children. 2006. American Journal of Health-System Pharmacy 63[11], 1062-SystemUnited States. | Survey on medication use, not relevant data on laxatives |
| Brooks et al. Review of the treatment literature for encopresis, functional constipation, and stool-toileting refusal. 2000. Annals of Behavioral Medicine 22[3], 260-267 | SR on a variety of interventions. Relevant individual studies already included in our review |
| Kot et al. Lactulose in the management of constipation: A current review. 1992. Annals of Pharmacotherapy 26[10], 1277-1282United States. | Review including both children and adults. Relevant individual studies already included in our review |
| Bell et al. Pediatric constipation therapy using guidelines and polyethylene glycol 3350. 2004. Annals of Pharmacotherapy 38[4], 686-693 | Non SR. Relevant individual studies already included in our review |
| Bentley. Faecal soiling and anal achalasia. 1978. Archives of Disease in Childhood 53[3], 185-186 | Clinical note |
| Clayden. Management of chronic constipation. 1992. Archives of Disease in Childhood 67[3], 340-344United Kingdom. | Review paper |
| Nolan et al. Randomised controlled trial of biofeedback training in persistent encopresis with anismus. 1998. Archives of Disease in Childhood 79[2], 131-135United Kingdom. | Biofeedback + conventional medical treatment vs. conventional medical treatment only. Will be considered for review on psychological/behavioural therapies |
| Sharif et al. Liquid paraffin: a reappraisal of its role in the treatment of constipation. 2001. Archives of Disease in Childhood 85[2], 121-124 | Review paper |
| Clayden et al. The management of chronic constipation and related faecal incontinence in childhood. 2005. Archives of Disease in Childhood: Education and Practice Edition 90[3], ep58-ep67United Kingdom. | Review paper |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Arora et al. Is polyethylene glycol safe and effective for chronic constipation in children? 2005. Archives of Disease in Childhood 90[6], 643-646 | Low quality systematic review. Mixed outcomes for disimpaction and maintenance. Individual studies already included in our review. (also analysed individually for review on adverse effects) |
| Patel et al. Predictive factors for short-term symptom persistence in children after emergency department evaluation for constipation. 2000. Archives of Pediatrics and Adolescent Medicine 154[12], 1204-1208United States. | Prospective case series. Outcomes not related to specific interventions. Better studies available |
| Bigelli et al. Anorectal manometry in children with chronic functional constipation. 2005. Arquivos de gastroenterologia 42[3], 178-181 | Outcomes not relevant |
| Bellomo-Brandao et al. Use of erythromycin for the treatment of severe chronic constipation in children. 2003. Brazilian Journal of Medical and Biological Research 36[10], 1391-1396Brazil. | Intervention not relevant |
| Fenn et al. A general practice study of the efficacy of Regulan in functional constipation. 1986. British Journal of Clinical Practice 40[5], 192-197 | Adult population |
| Ebelt et al. Constipation in childhood. 1992. Canadian Family Physician 38[SEP.], 2167-2174Canada. | Review paper |
| Rubin. Constipation. 2002. Clinical Evidence [7], 292-296 | Non SR. Relevant individual studies already included in our review |
| Rubin. Constipation. 2002. Clinical Evidence [8], 313-318 | Non SR. Relevant individual studies already included in our review |
| Rubin. Constipation in children. 2003. Clinical Evidence [10], 369-374 | Non SR. Relevant individual studies already included in our review |
| Rubin. Constipation in children. 2004. Clinical Evidence [11], 385-390 | Non SR. Relevant individual studies already included in our review |
| Rao et al. Randomized controlled trial of biofeedback, sham feedback, and standard therapy for dyssynergic defecation. 2007. Clinical Gastroenterology and Hepatology 5[3], 331-338 | Adult population |
| Gleghorn et al. No-enema therapy for idiopathic constipation and encopresis. 1991. Clinical Pediatrics 30[12], 669-672United States. | Retrospective case series. |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Sutphen et al. Long-term follow-up of medically treated childhood constipation. 1995. Clinical Pediatrics 34[11], 576-580 | Retrospective case series. Combined interventions: pharmacological + dietary modifications. Nothing reported on adverse effects |
| Snape, Jr. The effect of methylcellulose on symptoms of constipation. 1989. Clinical Therapeutics 11[5], 572-579 | Mainly adult population (mean age 53.9 years, range 9-96) |
| Siegel et al. Medical treatment of constipation. 2005. Clinics in Colon and Rectal Surgery 18[2], 76-80United States. | Review paper |
| Evans et al. Tegaserod for the treatment of irritable bowel syndrome and chronic constipation. 2007. Cochrane Database of Systematic Reviews #2007. Article Number[4]United Kingdom. | Intervention not relevant |
| Price et al. Stimulant laxatives for constipation and soiling in children. 2008. Cochrane Database of Systematic Reviews [2] | Empty SR |
| Connolly et al. Comparison of "Duphalac" and "irritant" laxatives during and after treatment of chronic constipation: a preliminary study. 1974. Current Medical Research and Opinion 2[10], 620-625 | Age range 4 to 90 years, but not other age-related descriptive variables reported. Age subgroup analysis not performed |
| Youssef. Childhood and adolescent constipation: Review and advances in management. 2007. Current Treatment Options in Gastroenterology 10[5], 401-411United Kingdom. | Review paper |
| Centre for Reviews and Dissemination. Review of the treatment literature for encopresis, functional constipation, and stool-toileting refusal (Provisional record). 2008. Database of Abstracts of Reviews of Effects [3] | Provisional record of a SR |
| Centre for Reviews and Dissemination. How useful is docusate in patients at risk for constipation: a systematic review of the evidence in the chronically ill (Structured abstract). 2008. Database of Abstracts of Reviews of Effects [3] | Structured abstract of SR |
| Elawad et al. Management of constipation in children with disabilities. 2001. Developmental Medicine and Child Neurology 43[12], 829-832United Kingdom. | Review paper |
| Hamilton et al. Clinical evaluation of methylcellulose as a bulk laxative. 1988. Digestive Diseases and Sciences 33[8], 993-998 | Adult population |
| Staiano et al. Cisapride in neurologically impaired children with chronic constipation. 1996. Digestive Diseases and Sciences 41[5], 870-874United States. | Intervention not relevant |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Tack et al. A risk-benefit assessment of cisapride in the treatment of gastrointestinal disorders. 1995. Drug Safety 12[6], 384-392New Zealand. | Intervention not relevant |
| Kiristioglu et al. Quantitation of defecation function using radionuclide artificial stool in children with chronic constipation. 2000. European Journal of Pediatric Surgery 10[6], 382-386Germany. | Diagnostic study. No clinical outcomes. |
| van Ginkel et al. Childhood constipation: Longitudinal follow-up beyond puberty. 2003. Gastroenterology 125[2], 357-363United States. | Prospective case series. Insufficient data on interventions/outcomes. |
| Smith et al. Patient and physician evaluation of a new bulk fiber laxative tablet. 2003. Gastroenterology Nursing 26[1], 31-37 | Adult population |
| Elkington. Lactulose. 1970. Gut 11[12], 1043-1048 | Review paper |
| Loening-Baucke. Constipation in early childhood: patient characteristics, treatment, and longterm follow up. 1993. Gut 34[10], 1400-1404 | Mixed intervention: pharmacological, behavioural, diet. Outcomes not related to specific interventions. |
| Gattuso et al. Clinical features of idiopathic megarectum and idiopathic megacolon. 1997. Gut 41[1], 93-99United Kingdom. | Prospective case series. Population outside remit of guideline. Insufficient data on laxatives as maintenance. |
| Corazziari et al. Long term efficacy, safety, and tolerabilitity of low daily doses of isosmotic polyethylene glycol electrolyte balanced solution (PMF-100) in the treatment of functional chronic constipation. 2000. Gut 46[4], 522-526 | Adult population |
| Ferguson et al. New polyethylene glycol electrolyte solution for the treatment of constipation and faecal impaction. 1999. Italian Journal of Gastroenterology and Hepatology 31 Suppl 3, S249-S252 | Adult population. Age range 17-84 (mean, median not reported) |
| Bass et al. The laxative effects of lactulose in normal and constipated subjects. 1981. Journal of Clinical Gastroenterology 3 Suppl 1, 23-28 | Adult population |
| Rockney et al. Encopresis treatment outcome: long-term follow-up of 45 cases. 1996. Journal of Developmental and Behavioral Pediatrics 17[6], 380-385 | Retrospective case series. Insufficient data on treatment outcomes |
| Ellis et al. What is the best therapy for constipation in infants? 2002. Journal of Family Practice 51[8], 682United States. | Review paper |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Szojda et al. Differences in taste between two polyethylene glycol preparations. 2007. Journal of Gastrointestinal and Liver Diseases 16[4], 379-381 | Adult population |
| Langer et al. IPEG colorectal panel. 2007. Journal of Laparoendoscopic and Advanced Surgical Techniques 17[1], 77-100United States. | Panel discussion at Annual Congress for Endosurgery in Children |
| Abrahamian et al. Chronic constipation in childhood: A longitudinal study of 186 patients. 1984. Journal of Pediatric Gastroenterology and Nutrition 3[3], 460-467United States. | Retrospective case series. |
| Nurko et al. Treatment of intractable constipation in children: Experience with cisapride. 1996. Journal of Pediatric Gastroenterology and Nutrition 22[1], 38-44United States. | Intervention not relevant for this review |
| Baker et al. Constipation in infants and children: Evaluation and treatment. 1999. Journal of Pediatric Gastroenterology and Nutrition 29[5], 612-626United States. | Individual studies cited already included in our review. |
| Halabi. Cisapride in management of chronic pediatric constipation. 1999. Journal of Pediatric Gastroenterology and Nutrition 28[2], 199-202 | Intervention not relevant |
| Nurko et al. Cisapride for the treatment of constipation children: A double-blind study. 2000. Journal of Pediatrics 136[1], 35-40United States. | Intervention not relevant |
| Bishop. Miracle laxative? 2001. Journal of Pediatric Gastroenterology and Nutrition 32[5], 514-515 | Editorial |
| Benninga et al. Childhood constipation: is there new light in the tunnel? 2004. Journal of Pediatric Gastroenterology and Nutrition 39[5], 448-464 | Review paper |
| Loening-Baucke. Functional fecal retention with encopresis in childhood. 2004. Journal of Pediatric Gastroenterology and Nutrition 38[1], 79-84 | Retrospective case series. |
| Loening-Baucke et al. Polyethylene glycol 3350 without electrolytes for the treatment of functional constipation in infants and toddlers. 2004. Journal of Pediatric Gastroenterology and Nutrition 39[5], 536-539 | Retrospective case series. |
| Loening-Baucke. Prevalence, symptoms and outcome of constipation in infants and toddlers. 2005. Journal of Pediatrics 146[3], 359-363 | Retrospective case series. Better studies available. Poorly reported outcomes. Not clear whether laxatives were administered separately or simultaneously. Duration of treatment not clear |
| Benninga et al. New treatment options in childhood constipation? 2005. Journal of Pediatric Gastroenterology and Nutrition 41 Suppl 1, S56-S57 | Editorial |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Constipation Guideline Committee of the North American Society for Pediatric Gastroenterology. Evaluation and treatment of constipation in infants and children: recommendations of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. 2006. Journal of Pediatric Gastroenterology and Nutrition 43[3], e1-13 | Excluded for analysis. Used as reference guideline. Individual references checked. |
| Davies et al. The influence of ispaghula husk on bowel habit. 1998. Journal of the Royal Society of Health 118[5], 267-271 | Adult population |
| Erickson et al. Polyethylene glycol 3350 for constipation in children with dysfunctional elimination. 2003. Journal of Urology 170[4 Pt 2], 1518-1520 | Retrospective case series |
| Velde et al. Achieving Fecal Continence in Patients With Spina Bifida: A Descriptive Cohort Study. 2007. Journal of Urology 178[6], 2640-2644United States. | Population outside remit of this guideline |
| Camilleri et al. A placebo-controlled trial of prucalopride for severe chronic constipation. 2008. New England Journal of Medicine 358[22], 2344-2354 | Adult population |
| Snow. Hyperkinesis and chronic constipation. 1975. New Zealand Medical Journal 81[541], 515-517 | Case reports |
| DiPalma et al. Polyethylene glycol laxative: A new option for constipation. 2002. Today's Therapeutic Trends #20[1], 59-67United States. | Review paper. Individual references checked |
| Li et al. Functional constipation in children: investigation and management of anorectal motility. 2008. World Journal of Pediatrics 4[1], 45-48 | Intervention not relevant |
| Miller et al. Emergency department management and short-term outcome of children with constipation. 2007. Pediatric Emergency Care 23[1], 1-4United States. | Retrospective case series. Insufficient data on treatment outcomes |
| Levitt et al. Laparoscopically assisted colon resection for severe idiopathic constipation with megarectosigmoid. 2003. Pediatric Endosurgery and Innovative Techniques 7[3], 285-289United States. | Intervention not relevant |
| Kobayashi et al. Acetylcholinesterase distribution and refractory constipation - A new criterion for diagnosis and management. 2002. Pediatric Surgery International 18[5-6], 349-6Germany. | Clinical outcomes poorly reported |
| Keshtgar et al. Role of anal dilatation in treatment of idiopathic constipation in children: Long-term follow-up of a double-blind randomized controlled study. 2005. Pediatric Surgery International 21[2], | Intervention not relevant |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| 100-105Germany. | |
| Loening-Baucke et al. Effect of treatment on rectal and sigmoid motility in chronically constipated children. 1984. Pediatrics 73[2], 199-205 | Main outcomes not relevant for review (non-clinical). Clinical outcomes very poorly described |
| McClung et al. Is combination therapy for encopresis nutritionally safe? 1993. Pediatrics 91[3], 591-594 | Poorly described "cleanout phase": a mix of interventions and no doses reported |
| Borowitz et al. Treatment of childhood constipation by primary care physicians: efficacy and predictors of outcome. 2005. Pediatrics 115[4], 873-877 | Prospective case series. Some data regarding maintenance with laxatives, but better studies available |
| Cordero et al. Protocols for ailments minor of the TESEMED project: Constipation. 2001. Pharmaceutical Care Espana 3[3], 155-174Spain. | Protocol |
| Godding. Therapeutics of laxative agents with special reference to the anthraquinones. 1976. Pharmacology 14 Suppl 1, 78-101 | Review paper |
| MacCarthy. Encopresis. 1976. Proceedings of the Royal Society of Medicine 69[1], 19-20 | Meeting paper |
| Benninga. Children with constipation: What happens to them when they grow up? 2004. Scandinavian Journal of Gastroenterology, Supplement 39[241], 23-26Norway. | Review paper |
| McDonald et al. Constipation and soiling - Outcome of treatment at one year. 2004. Scottish Medical Journal 49[3], 98-100United Kingdom. | Retrospective case series. No relevant outcomes |
| Keshtgar et al. Diagnosis and management of children with intractable constipation. 2004. Seminars in Pediatric Surgery 13[4], 300-309United States. | Review paper |
| Schnaufer et al. Differentiation and management of incontinence and constipation problems in children. 1970. Surgical Clinics of North America 50[4], 895-905 | Review paper |
| Quah et al. Prospective randomized crossover trial comparing fibre with lactulose in the treatment of idiopathic chronic constipation. 2006. Techniques in Coloproctology 10[2], 111-114 | Adult population |
| Ingebo et al. Polyethylene glycol-electrolyte solution for intestinal clearance in children with refractory encopresis. A safe and effective therapeutic program. 1988. American Journal of Diseases of Children | 16 children of a total sample of 24 had pathologies different from constipation, outcomes for 8 constipated children poorly reported. Adverse effects immediate and not long-term |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| 142[3], 340-342 | |
| Sondheimer et al. Lubricant versus laxative in the treatment of chronic functional constipation of children: a comparative study. 1982. Journal of Pediatric Gastroenterology and Nutrition 1[2], 223-226 | No clinical outcomes for disimpaction reported. Included for maintenance. |
| Secco. Review: behavioural interventions plus laxatives are effective for defecation disorders in children, but biofeedback does not add benefit. 2002. Evidence-Based Nursing 5[3], 76 | Abstract of a SR |
| Godbole et al. Idiopathic megarectum in children. 2001. European Journal of Pediatric Surgery 11[1], 48-51 | Prospective case series. Poorly reported outcomes. Better study designs available |
| van den Berg et al. Functional constipation in infants: a follow-up study. 2005. Journal of Pediatrics 147[5], 700-704 | Prospective case series. Intervention poorly described. Better study designs available |
| Ni et al. Use of cisapride with magnesium oxide in chronic pediatric constipation. 2001. Acta Paediatrica Taiwanica 42[6], 345-349 | Intervention not relevant |
| Speridiao et al. Dietary fiber, energy intake and nutritional status during the treatment of children with chronic constipation. 2003. Brazilian Journal of Medical and Biological Research 36[6], 753-759Brazil. | Intervention not relevant |
| Bush. Lactulose: an ideal laxative for children. 1970. New Zealand Medical Journal 71[457], 364-365 | Prospective case series. Very small sample size (n=11). Poorly reported outcomes. Better studies available |
| Chrzan et al. Colonic Washout Enemas for Persistent Constipation in Children with Recurrent Urinary Tract Infections Based on Dysfunctional Voiding. 2008. Urology 71[4], 607-610United States. | No clinical outcomes for constipation reported |
| Boccia et al. Dyspeptic symptoms in children: the result of a constipation-induced cologastric brake? 2008. Clinical Gastroenterology and Hepatology 6[5], 556-560 | Prospective case series. Small sample size (n=28). Poorly reported outcomes. Better studies available |
| Sprague-McRae et al. Encopresis: a study of treatment alternatives and historical and behavioral characteristics. 1993. Nurse Practitioner 18[10], 52-53 | Outcomes not relevant |
| Corazziari et al. Laxative consumption in chronic nonorganic constipation. 1987. Journal of Clinical Gastroenterology 9[4], 427-430 | Outcomes not related to specific interventions |
| Felt et al. Guideline for the management of pediatric idiopathic constipation and soiling. 1999. Archives of Pediatrics and Adolescent | Excluded as a guideline. Individual references already checked |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Medicine 153[4], 380-385United States. | |
| Hanson et al. The clinical effectiveness of Movicol in children with severe constipation: an outcome audit. 2006. Paediatric Nursing 18[2], 24-28 | Retrospective case series. Small sample size (n=23). Better studies available |
| Evaluation and treatment of constipation in children: Summary of updated recommendations of the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition. 2006. Journal of Pediatric Gastroenterology and Nutrition 43[3], 405-407United States. | Excluded as a guideline. Individual references already checked |
| Keuzenkamp-Jansen et al. Diagnostic dilemmas and results of treatment for chronic constipation. 1996. Archives of Disease in Childhood 75[1], 36-41 | Retrospective case series. Outcomes not related to specific interventions. Nothing reported on adverse effects |
| Michail et al. Polyethylene glycol for constipation in children younger than eighteen months old. 2004. Journal of Pediatric Gastroenterology and Nutrition 39[2], 197-199 | Retrospective case series. Small sample size (n=28). Excluded for maintenance, but included for adverse effects |
| Borowitz et al. Treatment of childhood constipation by primary care physicians: efficacy and predictors of outcome. 2005. Pediatrics 115[4], 873-877 | Prospective cohort. Interventions not explicitly described. Outcomes not clearly related to specific interventions |
| van Ginkel et al. Childhood constipation: Longitudinal follow-up beyond puberty. 2003. Gastroenterology 125[2], 357-363United States. | Prospective cohort. Interventions not clearly described |
| Pashankar et al. Long-term efficacy of polyethylene glycol 3350 for the treatment of chronic constipation in children with and without encopresis. 2003. Clinical Pediatrics 42[9], 815-819 | Retrospective cohort. No outcomes for disimpaction. Better studies available for maintenance. Included for side effects |
| Taubman et al. Overflow encopresis and stool toileting refusal during toilet training: A prospective study on the effect of therapeutic efficacy. 1997. Journal of Pediatrics 131[5], 768-771United States. | Non RCT. 2 arms organised according to previous toilet training. All children on the same laxative treatment |
| Levine et al. Children with encopresis: a study of treatment outcome. 1976. Pediatrics 58[6], 845-852 | Prospective case series. Combined interventions. Better studies available |
| Hardikar et al. Macrogol 3350 plus electrolytes for chronic constipation in children: a single-centre, open-label study. 2007. Journal of Paediatrics and Child Health 43[7-8], 527-531 | Prospective case series. Better studies available |
| van der Plas et al. Biofeedback training in treatment of childhood constipation: a randomised controlled study. 1996. Lancet 348[9030], 776-780 | RCT: conventional treatment vs. conventional treatment + biofeedback. Will be considered for review on psychological/behavioural therapies |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Banaszkiewicz et al. Ineffectiveness of Lactobacillus GG as an adjunct to lactulose for the treatment of constipation in children: a double-blind, placebo-controlled randomized trial. 2005. Journal of Pediatrics 146[3], 364-369 | RCT: laxative + lactobacillus vs. laxative + placebo. Will be considered for review on dietary modifications |
| Cox et al. Additive benefits of laxative, toilet training, and biofeedback therapies in the treatment of pediatric encopresis. 1996. Journal of Pediatric Psychology 21[5], 659-670 | RCT: laxative + toilet training vs. laxative + toilet training + biofeedback. Will be considered for review on psychological/behavioural therapies |
| Borowitz et al. Treatment of childhood encopresis: A randomized trial comparing three treatment protocols. 2002. Journal of Pediatric Gastroenterology and Nutrition 34[4], 378-384United States. | RCT: laxatives vs. laxatives + behaviour management vs. laxatives + behaviour management + biofeedback. Will be considered for review on psychological/behavioural therapies |
| van der Plas et al. Randomised trial of biofeedback training for encopresis. 1996. Archives of Disease in Childhood 75[5], 367-374 | RCT: laxatives vs. laxatives + biofeedback. Will be considered for review on psychological/behavioural therapies |
| Cox et al. Contribution of behavior therapy and biofeedback to laxative therapy in the treatment of pediatric encopresis. 1998. Annals of Behavioral Medicine 20[2], 70-76 | RCT: laxatives vs. laxatives + toilet training vs. laxatives + toilet training + biofeedback. Will be considered for review on psychological/behavioural therapies |
| Brazzelli et al. Behavioural and cognitive interventions with or without other treatments for the management of faecal incontinence in children. 2008. Cochrane Database of Systematic Reviews [2] | Systematic review. Excluded as such, but relevant individual references checked. Will be considered as SR for review on psychological/behavioural therapies |
| van Dijk et al. Behavioral therapy for childhood constipation: a randomized, controlled trial. 2008. Pediatrics 121[5], e1334-e1341 | RCT: laxatives vs. laxatives + behavioural therapies. Will be considered for review on psychological/behavioural therapies |
| Pijpers et al. Currently recommended treatments of childhood constipation are not evidence based. A systematic literature review on the effect of laxative treatment and dietary measures. 2008. Archives of Disease in Childhood | Systematic review. Excluded as such, but relevant individual references checked. Will also be considered for review on dietary interventions |
| Dupont et al. A dose determination study of polyethylene glycol 4000 in constipated children: factors influencing the maintenance dose. 2006. Journal of Pediatric Gastroenterology and Nutrition 42[2], 178-185 | Dose-binding study |
| Bulut et al. Encopretic children: experience with fifty cases. 1991. Turkish Journal of Pediatrics 33[3], 167-172 | Non RCT. Better quality studies available |
| van Ginkel et al. The effect of anorectal manometry on the outcome of treatment in severe childhood constipation: a randomized, controlled trial. 2001. Pediatrics 108[1], E9 | RCT. Laxatives + advice vs. laxatives + advice + anorectal manometry. Will be considered for review on anorectal manometry |
| Guest et al. Clinical and economic impact of using macrogol 3350 plus electrolytes in an outpatient setting compared to enemas and suppositories and manual evacuation to treat paediatric faecal | Excluded for review on maintenance as better quality studies available. Included for review on disimpaction |

| Bibliographic Information | Reason for rejecting study |
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| impaction based on actual clinical practice in England and Wales. 2007. Current Medical Research and Opinion 23[9], 2213-2225 | |
| Harrington et al. Complications of Fleet enema administration and suggested guidelines for use in the pediatric emergency department. 1997. Pediatric Emergency Care 13[3], 225-226 | Adverse effects immediate and not long-term |
| Siegers et al. Anthranoid laxative abuse--a risk for colorectal cancer? 1993. Gut 34[8], 1099-1101 | Retrospective case series. 1095 patients, 51 aged 0 to 20 years, age group analysis done, but groups defined as <50, 50 to 70 and >70) |
| Mendoza et al. Systematic review: the adverse effects of sodium phosphate enema. 2007. Alimentary Pharmacology and Therapeutics 26[1], 9-20 | Adverse effects immediate and not long-term |
| Weinstein. First do no harm: The dangers of mineral oil. 2001. Paediatrics and Child Health 6[3], 129-131Canada. | Case study: girl with constipation and cerebral palsy |
| Friedman et al. Case 2: First do no harm. 2003. Paediatrics and Child Health 8[9], 573-575Canada. | Case study: healthy boy with anterior ectopic anus |
| Kinservik et al. Evidence-based practice. The efficacy and safety of polyethylene glycol 3350 in the treatment of constipation in children. 2004. Pediatric Nursing 30[3], 232-237 | Excluded as review because of low quality. Individual references checked |
| Badiali et al. Melanosis of the rectum in patients with chronic constipation. 1985. Diseases of the Colon and Rectum 28[4], 241-245 | Mostly adult population and no age groups analysis done |
| Zanetti et al. Lipoid pneumonia in children following aspiration of mineral oil used in the treatment of constipation: high-resolution CT findings in 17 patients. 2007. Pediatric Radiology 37[11], 1135-1139 | Clinical data available for 12 children of the 17 originally included. 9 children had cerebral palsy and 2 children gastroesophageal reflux. |
| McAndrew et al. Continent catheterizable conduits: which stoma, which conduit and which reservoir? 2002. BJU International 89[1], 86-89 | Only 4 out of 89 children diagnosed with "constipation", not clearly idiopathic. No subgroup analysis performed. No relevant clinical outcomes for effectiveness in treating constipation |
| Mellon et al. Treatment of retentive encopresis with diet modification and scheduled toileting vs. mineral oil and rewards for toileting: A clinical decision. 1996. Ambulatory Child Health 1[3], 214-222United Kingdom. | RCT, 25 children. Laxatives + rewards vs. diet modification + scheduled toilet training. Will be considered for review on psychological/behavioural therapies |
| van Ginkel et al. Lack of benefit of laxatives as adjunctive therapy for functional nonretentive fecal soiling in children. 2000. Journal of Pediatrics 137[6], 808-813 | Children with encopresis only and without fulfilling any other criterion of constipation. Encopresis defined as the voluntary or involuntary passage of a normal bowel movement in the underwear after the age of 4 years. Constipation defined as fulfilling at least 2 of the following 4 criteria: 2 or more episodes of encopresis/week, <3 bowel movements/week, periodic passage of very large amounts of stool and a |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| | palpable abdominal or rectal mass |
| Nolan et al. Randomised trial of laxatives in treatment of childhood encopresis. 1991. Lancet 338[8766], 523-527 | No clinical outcomes for disimpaction, only radiological ones.<br>Excluded for maintenance, because it Included children with encopresis, evidence of stool on plain abdominal radiography but excluded children with severe or prolonged constipation necessitating previous hospital admissions for enemas and other treatments. Primary encopresis defined when child had never achieved faecal continence for >1 month. Secondary encopresis if faecal continence had ever been achieved for >1 month. Intervention is a combination of laxatives (liquid paraffin, senna granules and/or bisacodyl tablets) and doses are not clearly reported for all of them. |
| Hyde et al. Using saline solutions for ACE washouts. 2008. Archives of Disease in Childhood 93[2], 149-150 | Very small sample size (only 4 children). Not clear whether children had idiopathic constipation |
| Wang et al. [Forlax in the treatment of childhood constipation: a randomized, controlled, multicenter clinical study]. [Chinese]. 2007. Zhongguo Dangdai Erke Zazhi (Chinese Journal of Contemporary Pediatrics) 9[5], 429-432 | Paper written in Chinese |
| Pensabene et al. [Success of antegrade enemas in children with functional constipation]. [Italian]. 2003. Pediatria Medica e Chirurgica 25[2], 126-130 | Paper written in Italian |
| Ekmark et al. The antegrade continence enema (ACE) surgical procedure: patient selection, outcomes, long-term patient management. 2000. European Journal of Pediatric Surgery 10 Suppl 1, 49-51 | All children had myelomeningocele |
| Bani-Hani et al. Tap water irrigation and additives to optimize success with the Malone antegrade continence enema: the Indiana University algorithm. 2008. Journal of Urology 180[4 Suppl], 1757-1760 | 256 children, all but 1 with organic causes of constipation |
| Nanigian et al. Intermediate-term outcome of the simplified laparoscopic antegrade continence enema procedure: less is better. 2008. Journal of Urology 179[1], 299-303 | All children had organic causes of constipation |
| Pijpers et al. Currently recommended treatments of childhood constipation are not evidence based: a systematic literature review on the effect of laxative treatment and dietary measures. 2009. Archives of Disease in Childhood 94[2], 117-131 | All references checked. All relevant studies already retrieved and already included in our review |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Candy et al. Macrogol (polyethylene glycol) laxatives in children with functional constipation and faecal impaction: a systematic review. 2009. Archives of Disease in Childhood 94[2], 156-160 | All references checked. All relevant studies already retrieved and already included in our review |
| Michaud et al. Outcome of functional constipation in childhood: a 10-year follow-up study. 2009. Clinical Pediatrics 48[1], 26-31 | No data on adverse effects reported |

### Effectiveness of Diet and Lifestyle modifications in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Elia et al. Systematic review and meta-analysis: the clinical and physiological effects of fibre-containing enteral formulae. 2008. Alimentary Pharmacology and Therapeutics 27[2], 120-145 | Population out of remit of guideline: healthy volunteers and hospitalised tube-fed patients |
| McEligot et al. High dietary fiber consumption is not associated with gastrointestinal discomfort in a diet intervention trial. 2002. Journal of the American Dietetic Association 102[4], 549-551 | Adult population |
| Elawad et al. Management of constipation in children with disabilities. 2001. Developmental Medicine and Child Neurology 43[12], 829-832United Kingdom. | Non systematic review paper. References checked |
| Mooren et al. The connection between dietary fibre intake and chronic constipation in children. 1996. Nederlands Tijdschrift voor Geneeskunde 140[41], 2036-2039 | Paper in Dutch |
| Moore et al. Effects of fructo-oligosaccharide-supplemented infant cereal: A double-blind, randomized trial. 2003. British Journal of Nutrition 90[3], 581-587United Kingdom. | Healthy children |
| Payler et al. The effect of wheat bran on intestinal transit. 1975. Gut 16[3], 209-213 | Healthy population (both children and adults) |
| Turunen et al. Lymphoid nodular hyperplasia and cow's milk hypersensitivity in children with chronic constipation. 2004. Journal of Pediatrics 145[5], 606-611 | Paper also excluded from the cow's milk review as excluding cow's milk was combined with laxative administration. Clinical outcomes poorly reported. Results mainly concerned with histological outcomes |
| Rubin et al. Chronic constipation in children. 2006. British Medical Journal 333[7577], 1051-1055United Kingdom. | Non systematic review paper |
| Williams. Importance of dietary fiber in childhood. 1995. Journal of the American Dietetic Association 95[10], 1140-1146United States. | Non systematic review paper. References checked |
| Ling et al. Dietary treatment of diarrhea and constipation in infants and children. 1978. Issues in Comprehensive Pediatric Nursing 3[4], 17-28 | Non systematic review paper. References checked |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Rubin. Constipation in children. 2003. Clinical Evidence [10], 369-374 | Clinical evidence update search and appraisal: Found no RCTs or SR on the effects of increasing dietary fibre in children |
| Rubin. Constipation. 2002. Clinical Evidence [8], 313-318 | Clinical evidence update search and appraisal: Found no RCTs or SR on the effects of increasing dietary fibre in children |
| Stark et al. Evaluation of a standard protocol for retentive encopresis: a replication. 1997. Journal of Pediatric Psychology 22[5], 619-633 | Combined intervention: mainly behavioural psychological programme + enema use. Only dietary component consisted on instructing parents on how to provide adequate fibre intake to children, but no other details provided. |
| Hillemeier. An overview of the effects of dietary fiber on gastrointestinal transit. 1995. Pediatrics 96[5 Pt 2], 997-999 | Non systematic review paper. References checked |
| Liebl et al. Dietary fiber and long-term large bowel response in enterally nourished nonambulatory profoundly retarded youth. 1990. Journal of Parenteral and Enteral Nutrition 14[4], 371-375 | Population outside remit of guideline: all children nourished via gastrostomy tubes, non ambulatory, severely mentally disabled, and received high doses of anticonvulsants |
| Fischer et al. The effects of dietary fibre in a liquid diet on bowel function of mentally retarded individuals. 1985. Journal of Mental Deficiency Research 29[Pt 4], 373-381 | Population outside remit of guideline: all children tube-fed, non-ambulant, severely or profoundly mentally disabled |
| Houts et al. Use of dietary fiber and stimulus control to treat retentive encopresis: a multiple baseline investigation. 1988. Journal of Pediatric Psychology 13[3], 435-445 | Very small sample size: 3 children only. Combined interventions: increasing dietary fibre and water intake + scheduled toilet training + contingent used of suppositories. Better studies available |
| Heine. Gastroesophageal reflux disease, colic and constipation in infants with food allergy. 2006. Current Opinion in Allergy and Clinical Immunology 6[3], 220-225United States. | Non systematic review paper. References checked |
| Badiali et al. Effect of wheat bran in treatment of chronic nonorganic constipation. A double-blind controlled trial. 1995. Digestive Diseases and Sciences 40[2], 349-356 | Adult population |
| Olness et al. Chronic constipation in children: can it be managed by diet alone? 1982. Postgraduate Medicine 72[4], 149-154 | Prospective case series. Multiple interventions and outcomes poorly reported. Better studies available |
| Crowley et al. Evidence for a role of cow's milk consumption in chronic functional constipation in children: systematic review of the literature from 1980 to 2006. 2008. Nutrition and Dietetics 65[1], 29-35 | Excluded as systematic review as it includes papers that we have previously included and vice versa. References checked |
| Zoppi et al. Potential complications in the use of wheat bran for constipation in infancy. 1982. Journal of Pediatric Gastroenterology and Nutrition 1[1], 91-95 | Very small sample size (6 children). No clinical outcomes on effectiveness |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Guimaraes et al. Dietary fiber intake, stool frequency and colonic transit time in chronic functional constipation in children. 2001. Brazilian Journal of Medical and Biological Research 34[9], 1147-1153 | Poor quality observational study. Better intervention studies available |
| Chao et al. Cutoff volume of dietary fiber to ameliorate constipation in children. 2008. Journal of Pediatrics 153[1], 45-49 | Poor methodological study. Better studies available |
| Iacono et al. Persistent cow's milk protein intolerance in infants: the changing faces of the same disease. 1998. Clinical and Experimental Allergy 28[7], 817-823 | Retrospective cohort. Clinical outcomes poorly reported |
| Mellon et al. Treatment of retentive encopresis with diet modification and scheduled toileting vs. mineral oil and rewards for toileting: A clinical decision. 1996. Ambulatory Child Health 1[3], 214-222United Kingdom. | Combined interventions: laxatives + rewards vs. diet modification + scheduled toilet training. |
| Speridiao et al. Dietary fiber, energy intake and nutritional status during the treatment of children with chronic constipation. 2003. Brazilian Journal of Medical and Biological Research 36[6], 753-759Brazil. | Prospective case series. Combined interventions: laxative+ dietary modifications. |
| Morais et al. Measurement of low dietary fiber intake as a risk factor for chronic constipation in children. 1999. Journal of Pediatric Gastroenterology and Nutrition 29[2], 132-135 | Case-control study. Better quality papers already included |
| Moro et al. Dosage-related bifidogenic effects of galacto- and fructooligosaccharides in formula-fed term infants. 2002. Journal of Pediatric Gastroenterology and Nutrition 34[3], 291-295 | Healthy children |
| Aggett et al. Nondigestible carbohydrates in the diets of infants and young children: a commentary by the ESPGHAN Committee on Nutrition. 2003. Journal of Pediatric Gastroenterology and Nutrition 36[3], 329-337 | Non systematic review paper. References checked |
| Edwards et al. Dietary fibre in infancy and childhood. 2003. Proceedings of the Nutrition Society 62[1], 17-23 | Non systematic review paper. References checked |
| Tabbers et al. Effect of the consumption of a fermented dairy product containing Bifidobacterium lactis DN-173 010 on constipation in childhood: A multicentre randomised controlled trial (NTRTC: 1571). 2009. BMC Pediatrics 9[1]United Kingdom. | Study protocol only |
| Borrelli et al. Neuroimmune interaction and anorectal motility in children with food allergy-related chronic constipation. 2009. American Journal of Gastroenterology 104[2], 454-463United Kingdom. | Apart from cow's milk other food exclude at the same time (eggs and soy protein). Results after carrying out specific double-blind placebo controlled challenges no reported |

## Effectiveness of Psychological and behavioural Interventions in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Secco. Review: behavioural interventions plus laxatives are effective for defecation disorders in children, but biofeedback does not add benefit. 2002. Evidence-Based Nursing 5[3], 76 | Abstract of a systematic review. A more recent version for the full review is available |
| Rubin. Constipation in children. 2003. Clinical Evidence [10], 369-374 | Evidence summaries. Full systematic review included already retrieved |
| McGrath et al. Empirically supported treatments in pediatric psychology: constipation and encopresis. 2000. Journal of Pediatric Psychology 25[4], 225-254 | SR on nocturnal enuresis |
| Poenaru et al. The Pediatric Bowel Management Clinic: initial results of a multidisciplinary approach to functional constipation in children. 1997. Journal of Pediatric Surgery 32[6], 843-848 | Already included in review for information and support. No comparison group. Multiple interventions. Behavioural aspect of intervention not described in detail |
| Centre for Reviews and Dissemination. Review of the treatment literature for encopresis, functional constipation, and stool-toileting refusal (Provisional record). 2008. Database of Abstracts of Reviews of Effects [3] | Provisional abstract of review already retrieved |
| Centre for Reviews and Dissemination. Mind-body interventions for gastrointestinal conditions (Structured abstract). 2008. Database of Abstracts of Reviews of Effects [4] | Structured abstract of a systematic review: references checked in evidence tables of the full report. Included both adults and children. All studies related to children and constipation already retrieved as individual papers |
| Centre for Reviews and Dissemination. Treating encopresis in people with intellectual disabilities: a literature review (Structured abstract). 2008. Database of Abstracts of Reviews of Effects [4] | Structured abstract of a systematic review: full paper retrieved |
| Centre for Reviews and Dissemination. The effectiveness of different methods of toilet training for bowel and bladder control (Provisional record). 2008. Database of Abstracts of Reviews of Effects [4] | Structured abstract of a systematic review already retrieved |
| Klassen et al. The effectiveness of different methods of toilet training for bowel and bladder control. 2006. Evidence Report/Technology Assessment [147], 1-57 | Excluded as a review. Included healthy children, children with learning disabilities and children with organic constipation (spina bifida, anal atresia, and Hirschsprung's disease). Individual references checked to identify children with non organic conditions who could |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| | have been constipated in the first place. Baseline bowel function was not reported in the majority of these studies and when it was reported it did not explicitly stated that children were constipated. Constipation was treated in this review as a risk factor impairing effective toilet training |
| Chang et al. Effect of electrical stimulation in constipated patients with impaired rectal sensation. 2003. International Journal of Colorectal Disease 18[5], 433-438 | Adult population |
| Wang et al. Prospective study of biofeedback retraining in patients with chronic idiopathic functional constipation. 2003. World Journal of Gastroenterology 9[9], 2109-2113 | Mostly adult population (mean age: 52.6 years, range 10 to 71) |
| Heymen et al. Biofeedback treatment of constipation: a critical review. 2003. Diseases of the Colon and Rectum 46[9], 1208-1217 | Low quality systematic review. Included both adults and children. References for individual studies in children checked and relevant individual studies retrieved |
| Brooks et al. Review of the treatment literature for encopresis, functional constipation, and stool-toileting refusal. 2000. Annals of Behavioral Medicine 22[3], 260-267 | Low quality systematic review. References for individual studies checked and relevant studies retrieved |
| Taichert. Childhood encopresis: a neurodevelopmental-family approach to management. 1971. California Medicine 115[2], 11-18 | Case studies: 5 children. Combined interventions: stool softener+ psychopharmacological drugs+ diet+ family therapy |
| Gavanski. Treatment of non-retentive secondary encopresis with imipramine and psychotherapy. 1971. Canadian Medical Association Journal 104[1], 46-48 | 3 case studies |
| Rao et al. How useful are manometric tests of anorectal function in the management of defecation disorders? 1997. American Journal of Gastroenterology 92[3], 469-475 | Only 48% of total sample diagnosed with “constipation”. Unclear whether this was idiopathic. Intervention aspect in the study poorly reported, better studies available |
| Loening-Baucke. Constipation in early childhood: patient characteristics, treatment, and longterm follow up. 1993. Gut 34[10], 1400-1404 | Prospective case series. Mixed interventions (laxatives + diet +toilet training). Better studies available |
| Liebman. Disorders of defecation in children: evaluation and management. 1979. Postgraduate Medicine 66[2], 105-108 | Prospective case series. Mixed interventions (mainly laxatives + dietary advice + advice on how to sit in potty/toilet). Outcomes poorly reported. Better studies available |
| Palsson et al. Biofeedback treatment for functional anorectal disorders: A comprehensive efficacy review. 2004. Applied Psychophysiology Biofeedback 29[3], 153-174United States. | Low quality systematic review. Included both adults and children References for individual studies checked and relevant studies retrieved |
| Baumann et al. Treatment of incontinent boys with non-obstructive disease. 1974. Journal of Urology 111[1], 114-116 | Suggestion and hypnotherapy were combined with medication (unclear which one). Study very poorly reported (in 1 paragraph) with no details on inclusion/exclusion criteria, intervention or outcomes |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Shepherd et al. Faecal incontinence in childhood: A multidisciplinary approach including biofeedback. 1989. Australian Paediatric Journal 25[6], 351-355Australia. | Prospective case series. 7/98 children included had organic causes of constipation. Outcomes reported for children who received biofeedback were all not clinical and therefore not relevant to this guideline |
| Carr. The effectiveness of family therapy and systemic interventions for child-focused problems. 2009. Journal of Family Therapy 31[1], 3-45 | Excluded as a review as it included interventions for different problems. Individual references related to encopresis already retrieved |
| Cox et al. Contribution of behavior therapy and biofeedback to laxative therapy in the treatment of pediatric encopresis. 1998. Annals of Behavioral Medicine 20[2], 70-76 | First report of a RCT already included in our review |
| Davis et al. A pilot study of encopretic children treated by behaviour modification. 1977. Practitioner 219[1310], 228-230 | Case series. pilot study, 11 children, unclear whether children were constipated |
| Cox et al. Simple electromyographic biofeedback treatment for chronic pediatric constipation/encopresis: preliminary report. 1994. Biofeedback and Self Regulation 19[1], 41-50 | Non-randomised study. RCTs using the same comparison already included in our review |
| van Ginkel et al. The effect of anorectal manometry on the outcome of treatment in severe childhood constipation: a randomized, controlled trial. 2001. Pediatrics 108[1], E9 | Anorectal manometry as psycho-behavioural intervention not included in the guideline scope |
| Lancioni et al. Treating Encopresis in People with Intellectual Disabilities: a Literature Review. 2001. Journal of Applied Research in Intellectual Disabilities 14, 47-63 | Non-systemic review of low quality studies (case reports and case series). Interventions included are not different from the ones used in children who do not have intellectual disabilities |
| Young et al. Functional encopresis: symptom reduction and behavioral improvement. 1995. Journal of Developmental and Behavioral Pediatrics 16[4], 226-232 | Non-randomised study. Comparison non-clinically relevant: encopretic children vs. healthy children. |
| Parker. To do or not to do? That is the question. Pediatric constipation. 1999. Pediatric Annals 28[5], 283-290 | Discussion paper |
| Farrell et al. Management of childhood constipation: parents' experiences. 2003. Journal of Advanced Nursing 44[5], 479-489 | Qualitative study, no effectiveness of intervention assessed. |
| Murphy et al. Enuresis and encopresis. 2001. What Works with Children and Adolescents?: A Critical Review of Psychological Interventions with Children, Adolescents and their Families. Carr, Alan (Ed) [2], 49-64 | Non-systemic review, references checked, no relevant studies identified. |
| Crowley. A comprehensive strategy for managing encopresis. 1984. MCN, American Journal of Maternal Child Nursing 9[6], 395-400 | Uncontrolled study, small sample (18 children). Better studies available assessing this intervention |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Kohen et al. The use of relaxation-mental imagery (self-hypnosis) in the management of 505 pediatric behavioral encounters. 1984. Journal of Developmental and Behavioral Pediatrics 5[1], 21-25 | Non-systemic review, references checked, no relevant studies identified. |
| Cox et al. Additive benefits of laxative, toilet training, and biofeedback therapies in the treatment of pediatric encopresis. 1996. Journal of Pediatric Psychology 21[5], 659-670 | First report of a RCT already included in our review |
| van der Plas et al. Randomised trial of biofeedback training for encopresis. 1996. Archives of Disease in Childhood 75[5], 367-374 | Subject eligibility was based on the presence of solitary encopresis without any other criteria of constipation-that is, normal stool frequency of 3 times per week or more, no periodic passage of very large amounts of stool, and no palpable abdominal or rectal masses |
| van Everdingen-Faasen et al. Psychosocial co-morbidity affects treatment outcome in children with fecal incontinence. 2008. European Journal of Pediatrics 167[9], 985-989 | Prospective case series. Multiples interventions (laxative, psychosocial interventions, biofeedback). Better studies already included in our review |
| Chiarioni et al. The role of biofeedback in the treatment of gastrointestinal disorders. 2008. Nature Clinical Practice Gastroenterology and Hepatology 5[7], 371-382United Kingdom. | Non systematic review. All references checked. All relevant studies already retrieved and already included in our review |
| Matson et al. Encopresis, soiling and constipation in children and adults with developmental disability. 2009. Research in Developmental Disabilities 30[4], 799-807 | Non systematic review. All references checked. All relevant studies already retrieved and already included in our review |

## Effectiveness of Complementary Therapies for ongoing treatment/maintenance in Children with Chronic Idiopathic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Centre for Reviews and Dissemination. Mind-body interventions for gastrointestinal conditions (Structured abstract). 2008. Database of Abstracts of Reviews of Effects [4] | Structured abstract of a systematic review: references checked in evidence tables of the full report. All studies related to children and constipation are on psychological-behavioural interventions |
| Hall et al. Gastric function during hypnosis and hypnotically-induced gastrointestinal symptoms. 1967. Journal of Psychosomatic Research 11[3], 263-266 | Healthy adult volunteers |
| Youssef et al. Functional abdominal pain in children. 2008. Journal of Clinical Outcomes Management 15[5], 248-256United States. | Non systematic review. References checked |
| Youssef. Childhood and adolescent constipation: Review and advances in management. 2007. Current Treatment Options in Gastroenterology 10[5], 401-411United Kingdom. | Non systematic review. References checked |
| Centre for Reviews and Dissemination. Evidence of clinical efficacy of homeopathy: a meta-analysis of clinical trials (Structured abstract). 2008. Database of Abstracts of Reviews of Effects [4] | Constipation not included |
| Timothy et al. Integrative Approaches to Childhood Constipation and Encopresis. 2007. Pediatric Clinics of North America 54[6], 927-947 | Non systematic review. References checked |
| Williams et al. Hypnosis as a facilitating therapeutic adjunct in child psychiatry. 1976. Journal of the American Academy of Child Psychiatry 15[2], 326-342 | No children with constipation included |
| Moss et al. Abdominal massage for the treatment of idiopathic constipation in children with profound learning disabilities: a single case study design. 2008. British Journal of Learning Disabilities 36[2], 102-108 | Very small sample size: 5 children, 1 with concomitant hypothyroidism. All children were on laxatives already. |
| Olsen. Sanicula Aqua: water as medicine. 2003. American Journal of Homeopathic Medicine 96[3], 211-224 | 2 case studies. No clear definition of constipation given. Relevant outcomes poorly reported |
| Olness. Autohypnosis in functional megacolon in children. 1976. American Journal of Clinical Hypnosis 19[1], 28-32 | 5 case studies: 1 child with Hirschsprung's disease. Diagnosis of idiopathic constipation unclear in other 4 |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Silva et al. Improvement in sensory impairment and social interaction in young children with autism following treatment with an original Qigong massage methodology. 2007. American Journal of Chinese Medicine 35[3], 393-406 | Only 3 children of the total sample (n=15) had constipation. Relevant outcomes are poorly reported |
| Silber. Encopresis: rectal rebellion and anal anarchy? 1968. Journal of the American Society of Psychosomatic Dentistry and Medicine 15[3], 97-106 | Single case study. |
| Baumann et al. Treatment of incontinent boys with non-obstructive disease. 1974. Journal of Urology 111[1], 114-116 | Suggestion and hypnotherapy were combined with medication (unclear which one). Study very poorly reported (in 1 paragraph) with no details on inclusion/exclusion criteria, intervention or outcomes |

## Effectiveness of Information and Support in the management of Children with Chronic Constipation

| Bibliographic Information | Reason for rejecting study |
|---|---|
| Loening-Baucke. Constipation in early childhood: patient characteristics, treatment, and longterm follow up. 1993. Gut 34[10], 1400-1404 | Prospective case series. Combined interventions and outcomes not related to any specific intervention. Better studies available |
| Bernard-Bonnin et al. Parental and patient perceptions about encopresis and its treatment. 1993. Journal of Developmental and Behavioral Pediatrics 14[6], 397-400 | Service intervention not clearly described in term of information and support provided |
| Bonner et al. Children who soil: guidelines for good practice. 2003. Journal of Family Health Care 13[2], 32 | No outcomes reported |
| Vitito. Self-care interventions for the school-aged child with encopresis. 2000. Gastroenterology Nursing 23[2], 73-77 | Non systematic review on interventions already included in the guideline. No interventions related to providing information and support |
| Gardner et al. ICP for children attending the nurse led constipation clinic. 2006. Journal of Integrated Care Pathways 10[2], 68United Kingdom. | No outcomes reported |
| McDonald et al. Constipation and soiling - Outcome of treatment at one year. 2004. Scottish Medical Journal 49[3], 98-100United Kingdom. | Retrospective case series. No interventions related to information and support |
| Glia et al. Quality of life in patients with different types of functional constipation. 1997. Scandinavian Journal of Gastroenterology 32[11], 1083-1089 | Population age range 17 to 79 years (median 53) |
| Lawes et al. Continence Journal. Encopresis in children with learning disabilities. 2007. Nursing Times 103[14], 43-44 | Health outcomes in children not reported |
| Eshchar et al. Re-education of constipated patients-- A non-medical treatment. 1981. American Journal of Proctology, Gastroenterology and Colon and Rectal Surgery 32[9], 16-17 | Population age range 7 to 72 years (mean 42) |
| Smith et al. Constipation services for children: the role of health visitor teams. 2006. British Journal of Nursing 15[4], 193-195 | Survey, no intervention |
| van Ginkel et al. Childhood constipation: Longitudinal follow-up beyond puberty. 2003. Gastroenterology 125[2], 357-363United States. | Prospective case series. Interventions and outcomes poorly reported. Better studies available |

| Bibliographic Information | Reason for rejecting study |
|---|---|
| van der Plas et al. Treatment of defaecation problems in children: the role of education, demystification and toilet training. 1997. European Journal of Pediatrics 156[9], 689-692 | Prospective case series. Education and support not clearly described. Will be considered for review on psychological/behavioural interventions |
| Levine et al. Children with encopresis: a study of treatment outcome. 1976. Pediatrics 58[6], 845-852 | Prospective case series. Laxative + education + toilet training. Will be considered for review on psychological/behavioural interventions |
| Collis et al. Childhood chronic constipation: an innovative community-based parent education group program. 2007. Australian Occupational Therapy Journal 54[4], 307-309 | Poor methodological study. Paper mainly concerned with describing the programme. Parents surveyed, but sample size not reported, authors stated that program has been "informally evaluated". Poor reporting of outcomes |
| Fishman et al. Trends in referral to a single encopresis clinic over 20 years. 2003. Pediatrics 111[5 Pt 1], e604-e607 | Retrospective cohort. Unclear whether there was any element of information/support in the intervention |
| Rennie et al. Home-based management of constipation and soiling. 1997. Ambulatory Child Health 3[3], 219-224United Kingdom. | Retrospective case note audit. Small sample size. Better studies available |
| Procter et al. A 6-year follow-up study of chronic constipation and soiling in a specialist paediatric service. 2003. Child: Care, Health and Development 29[2], 103-109United Kingdom. | Retrospective postal survey. No intervention described |
| Hambleton et al. User satisfaction with a constipation service: a comparative audit. 2006. Paediatric Nursing 18[1], 23-26 | Retrospective audit. Small sample size. Better studies available |