Aktiv Druck & Verlag GmbH | ISSN 0170 - 5334 I 02330

www.ai-online.info

66. Jahrgang | Juni 2025

A&I

ANÄSTHESIOLOGIE & INTENSIVMEDIZIN

Offizielles Organ: Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin e. V. (DGAI)
Berufsverband Deutscher Anästhesistinnen und Anästhesisten e. V. (BDA)
Organ: Deutsche Interdisziplinäre Vereinigung für Intensiv- und Notfallmedizin e. V. (DIVI)

Cyclical (or cyclic) vomiting syndrome

orphananesthesia

a project of the German Society
of Anaesthesiology and Intensive Care Medicine

SUPPLEMENT NR. 5 | 2025

OrphanAnesthesia –

ein krankheitsübergreifendes Projekt des Wissenschaftlichen Arbeitskreises Kinderanästhesie der Deutschen Gesellschaft für Anästhesiologie und Intensivmedizin e.V.

Ziel des Projektes ist die Veröffentlichung von Handlungsempfehlungen zur anästhesiologischen Betreuung von Patientinnen und Patienten mit seltenen Erkrankungen. Damit will OrphanAnesthesia einen wichtigen Beitrag zur Erhöhung der Patientensicherheit leisten.

Patientinnen und Patienten mit seltenen Erkrankungen benötigen für verschiedene diagnostische oder therapeutische Prozeduren eine anästhesiologische Betreuung, die mit einem erhöhten Risiko für anästhesieassoziierte Komplikationen einhergehen. Weil diese Erkrankungen selten auftreten, können Anästhesistinnen und Anästhesisten damit keine Erfahrungen gesammelt haben, sodass für die Planung der Narkose die Einholung weiterer Information unerlässlich ist. Durch vorhandene spezifische Informationen kann die Inzidenz von mit der Narkose assoziierten Komplikationen gesenkt werden. Zur Verfügung stehendes Wissen schafft Sicherheit im Prozess der Patientenversorgung.

Die Handlungsempfehlungen von OrphanAnesthesia sind standardisiert und durchlaufen nach ihrer Erstellung einen Peer-Review-Prozess, an dem eine Anästhesistin bzw. ein Anästhesist sowie eine weitere Krankheitsexpertin bzw. ein weiterer Krankheitsexperte (z. B. Pädiaterin bzw. Pädiater oder Neurologin bzw. Neurologe) beteiligt sind. Das Projekt ist international ausgerichtet, sodass die Handlungsempfehlungen grundsätzlich in englischer Sprache veröffentlicht werden.

Ab Heft 5/2014 werden im monatlichen Rhythmus je zwei Handlungsempfehlungen als Supplement der A&I unter www.ai-online.info veröffentlicht. Als Bestandteil der A&I sind die Handlungsempfehlungen damit auch zitierfähig. Sonderdrucke können gegen Entgelt bestellt werden.

Bisher in A&I publizierte Handlungsempfehlungen finden Sie unter:

www.ai-online.info/Orphsuppl
www.orphananesthesia.eu

OrphanAnesthesia –

a project of the Scientific Working Group of Paediatric Anaesthesia of the German Society of Anaesthesiology and Intensive Care Medicine

The target of OrphanAnesthesia is the publication of anaesthesia recommendations for patients suffering from rare diseases in order to improve patients' safety. When it comes to the management of patients with rare diseases, there are only sparse evidence-based facts and even far less knowledge in the anaesthetic outcome. OrphanAnesthesia would like to merge this knowledge based on scientific publications and proven experience of specialists making it available for physicians worldwide free of charge.

All OrphanAnesthesia recommendations are standardized and need to pass a peer review process. They are being reviewed by at least one anaesthesiologist and another disease expert (e.g. paediatrician or neurologist) involved in the treatment of this group of patients.

The project OrphanAnesthesia is internationally oriented. Thus all recommendations will be published in English.

Starting with issue 5/2014, we'll publish the OrphanAnesthesia recommenations as a monthly supplement of A&I (Anästhesiologie & Intensivmedizin). Thus they can be accessed and downloaded via www.ai-online.info. As being part of the journal, the recommendations will be quotable. Reprints can be ordered for payment.

Find a survey of the recommendations published until now on:

www.ai-online.info/Orphsuppl
www.orphananesthesia.eu

Projektleitung

Prof. Dr. Tino Münster, MHBA

Chefarzt
Klinik für Anästhesie und operative Intensivmedizin
Krankenhaus Barmherzige Brüder Regensburg
Prüfeninger Straße 86
93049 Regensburg,
Deutschland

Tel.: 0941 369-2350

E-Mail: Tino.Muenster@barmherzige-regensburg.de

DGAI
Deutsche Gesellschaft für Anästhesiologie & Intensivmedizin

www.dgai.de

A&I
ANÄSTHESIOLOGIE & INTENSIVMEDIZIN

www.ai-online.info

orphanaesthesia

Anaesthesia recommendations for patients suffering from

Cyclical (or cyclic) vomiting syndrome

Disease name: Cyclical (or cyclic) vomiting syndrome

ICD 10: G43.A0

Synonyms: Cyclical vomiting, not intractable; persistent vomiting, cyclical; cyclic vomiting, psychogenic

Cyclical vomiting syndrome (CVS) is a rare condition affecting ~3 in 100,000 children, with Caucasian but no sex predominance. It is generally a disorder of childhood with symptom onset in pre-school or early school age. Adult cases (onset in 3rd to 4th decade) have also been reported. As patients are well between episodes, there is usually a delay in diagnosis (2-3 years in children, longer in adults), with frequent emergency department presentations. It is a diagnosis of exclusion. Diagnostic criteria have been published by various bodies including the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition, the Rome Foundation (Rome IV 2016 under functional gastrointestinal disorders) and also the International Classification of Headache Disorders (3rd edition beta version). This reflects the uncertainty about the pathophysiology of the syndrome, described variously as functional, psychiatric, neurological either epileptogenic or autonomic dysfunction, occurring in association with or triggered by cannabis use versus a migraine variant or as episodic symptoms associated with migraine.

Medicine in progress

Perhaps new knowledge

Every patient is unique

Perhaps the diagnostic is wrong

Find more information on the disease, its centres of reference and patient organisations on Orphanet: www.orpha.net

▶ **Citation:** Palmer GM: Cyclical (or cyclic) vomiting syndrome. Anästh Intensivmed 2025;66:S98–S107. DOI: 10.19224/ai2025.S098

Emergency information

A	**AIRWAY / ANAESTHETIC TECHNIQUE**	Typical airway difficulties / anomalies / malformations? (Dis)Advantage for general (GA) or regional anaesthesia? (RA)
B	**BLOOD PRODUCTS (COAGULATION)**	Special preparation / storage of blood products necessary? Special haemostaseologic tests / consideration necessary? Coagulation disorders / pathologies?
C	**CIRCULATION**	Typical cardiopulmonary malformations, pathologies, arrhythmias…? Congenital heart disease/ anomaly? Special risk for heart failure? Haemodynamic specifics / risks?
D	**DRUGS**	Any drugs that should be avoided? Interactions with typical home medication? Special recommendations for premedication? Risk for MH/rhabdomyolysis?
E	**EQUIPMENT**	Special equipment (or care / assistance) needed for e.g., transport or within PACU/ IMC/ ICU?

Disease summary

The pattern experienced by an individual is stereotypical: a prodrome including nausea, a hyperemesis/vomiting phase (typically 6-8 episodes per hour for a few days; associated with continuing nausea, headache and abdominal pain), a recovery phase and an asymptomatic phase of a few to several weeks. Episodes are triggered by illness-infection, stress-anxiety, certain foods (similar to migraine triggers), sleep deprivation or physical exhaustion, exposure to cold/heat, allergies, motion sickness or menstruation. The episodes are intractable in nature, significantly impairing quality of life, with associated psychiatric comorbidity of anxiety and depression in a minority (27%).

Mortality is not reported. The prognosis in children is good with a significant percentage (61%) remitting fully in adolescence; although the adolescent may then develop headache and migraine (41%), abdominal pain or irritable bowel syndrome (62%). A genetic component is debated (although none have been identified) with a frequent association of family history of migraine (28%). There are case reports of patients labelled as having this syndrome but the symptoms reflect manifestations of a rarer mitochondrial or metabolic disorder (e.g., porphyria or of fatty acid oxidation such as acyl-coenzyme A dehydrogenase deficiencies).

General considerations in approaching patients with CVS (as per the approach for migraine sufferers) is to avoid the individual patient's triggers and other known precipitators, with attention to prophylactic and abortive therapies, supportive care for the patient during episodes and family support. The main anaesthetic concern is management of pre- or postoperative pain, nausea and vomiting (and associated patient and family distress if poorly controlled), and consequent dehydration, electrolyte or acid-base derangement and hypoglycaemia, if an episode is precipitated perioperatively. The evidence for abortive or prophylactic intervention is from mostly retrospective case series or case studies. The anaesthetist may be consulted in the non-operative setting by their gastroenterologist or emergency department colleagues for their antiemetic, sedative-anxiolytic expertise (as employed for resistant postoperative nausea and vomiting (PONV)).

Typical surgery

Patients with CVS will typically present in the pre-diagnosis phase for investigation to rule out underlying organic or mechanical causes of vomiting. Investigative procedures include upper (and lower) gastrointestinal endoscopy (electively or emergently for haematemesis) and imaging (X-ray, ultrasound including Doppler and assessment of bowel wall oedema/thickness [indicating ischaemia or resolved obstruction], HIDA scan, CT scan [if MRI unavailable and emergent imaging required] of abdomen with contrast, MRI/MRA of brain or abdomen) to demonstrate gastric emptying and bowel transit, gall bladder or renal pathology, intestinal obstruction (intussusception, malrotation, stricture or web), abdominal arterial or intracranial pathology (such as cerebral/posterior fossa tumour or arterio-venous anomaly/thrombosis). The investigations may be done electively or emergently if symptoms persist beyond 72 hours. Surgical biopsy for samples to rule out mitochondrial/metabolic disease may be requested. For young children, a general anaesthetic is commonly required.

Where the diagnosis is not established, the patients may receive surgery such as laparotomy, laparoscopy and appendicectomy (as abdominal pain is a feature of the syndrome). Other incidental surgery e.g. orthopaedic may be required when the diagnosis is known.

A series of adult patients with refractory CVS have had permanent gastric mucosal stimulators inserted but the level of evidence supporting this practice is low.

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

Type of anaesthesia

Although not specifically documented, patients with CVS may be at risk of pre and post-operative nausea and vomiting (PONV). Notably motion sickness, as an identified risk factor for PONV, is prevalent amongst CVS patients (28%). Similar to patients with migraine, avoidance of the patient's known triggers and control of pain, inflammation (particularly when involving the head and neck) and anxiety is desirable. As physical and psychological stress are precipitants of the episodes, the injury or illness prior or subsequent to surgery may trigger prolonged nausea and vomiting, resistant to standard antiemetic therapy. Whenever possible and appropriate, of the application of local and regional techniques to reduce or avoid general anaesthesia is ideal, along with use of multimodal anaesthesia to reduce or avoid intraoperative and postoperative opioid and/or tramadol.

When a patient presents for surgery, a perioperative plan using their usual effective medications (often these are used and are beneficial in acute migraine and migraine prophylaxis) and additional sedative and anxiolytic agents (including benzodiazepines and drugs from the antiepileptic, alpha-2 agonist, antihistamines, and antipsychotic classes) and liberal oral hydration (ideally with balanced rehydration solutions) and/or intravenous fluid supplementation (including glucose 10%) should be instituted. Therapy should be up-titrated to reduce preoperative anxiety (which may precipitate an episode) and commenced the day or night prior (for elective/semi-elective surgery) and a premedication given on the day of surgery (for elective and emergency surgery) with avoidance of prolonged fasting if no intravenous access in situ exists. Steroids have been used as both abortive and prophylactic therapy. At least three antiemetic interventions (ideally including dexamethasone), as recommended in the 2014 consensus guidelines for PONV should be employed intraoperatively. If GA is required, use of propofol bolus and infusion at sedative levels or as total intravenous anaesthesia (TIVA) may be taken into consideration.

Necessary additional diagnostic procedures (preoperative)

If the patient has been vomiting preoperatively, assessment of hydration, electrolyte, acid-base and glucose status and renal function, with correction of derangement is advisable. Hyponatraemia or hypernatraemia are both possible depending on the amount of water intake and salt supplementation tolerated. Acidosis and elevated lactate can occur in the setting of profound dehydration. Hypoglycaemia may occur with prolonged fasting and vomiting.

Particular preparation for airway management

Nil specific: Rapid sequence induction is a consideration depending on the surgical indication, e.g., in the event of an emergency procedure or preoperative vomiting. Gastric emptying is reported as being a usually normal occurrence or to occur rapidly in children and most adults with CVS, also in a subset of adults with reduced transit (opioid or marijuana users and diabetic patients).

Particular preparation for transfusion or administration of blood products

Nil reported.

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

Particular preparation for anticoagulation

Nil reported.

Particular precautions for positioning, transport or mobilisation

Nil reported. Patients may experience motion sickness. Transport in the left lateral position with suction available and the option to put the bed/transport trolley in Trendelenburg position will be appropriate in anticipation of vomiting due to movement or its emergence resulting from anaesthesia.

Probable interaction between anaesthetic agents and patient's long-term medication

Patients with CVS may be on prophylactic therapy (not supported by randomised trials to date) such as propranolol, clonidine, antiepileptics (sodium valproate, topiramate, gabapentin, lamotrigine, and carbamazepine*),* tricyclic antidepressants (amitriptyline or nortriptyline 1-2 mg/kg), barbiturates, antihistamines (including cyproheptadine), calcium channel blockers (e.g. flunarizine), mitochondrial therapy such as L-carnitine, co-enzyme Q10 or riboflavin and pizotifen (the latter like propranolol used in abdominal migraine) and previously erythromycin. They may also take opioids or present to emergency departments for systemic opioids for pain management. Marijuana (illicit and prescribed dronabinol) use is reported as alleviating symptoms by patients but can also be the causative agent (cannabinoid hyperemesis syndrome). Opioid and marijuana use and tolerance are relevant to the patient's perioperative anaesthetic and analgesic requirements. If arteriovenous thrombosis is suspected the patients may be on antiplatelet therapy which has both surgical and anaesthesia import if regional analgesia is being considered. Multimodal analgesia with non-opioid analgesia and use of opioid- sparing agents is desirable e.g., paracetamol and non-steroidal anti-inflammatory drugs. Prophylactic therapy for CVS can be opioid sparing and thus escalated in the perioperative setting to optimise analgesia. Patients with CVS will usually have plans for abortive (for use in the prodrome) and/or rescue therapy including 5HT-3 antagonists, other antiemetics, sumatriptan, benzodiazepines, barbiturates, antihistamines and proton pump inhibitors or H2 antagonists.

Usual care should be taken with particular attention to the co-administration of medications which may cause hypotension and bradycardia, sedation (which may be desirable), prolongation of the QT interval or serotonergic syndrome such as tramadol. As the latter can cause nausea and vomiting to the same extent as opioids, it may also be best to avoid it..

If the patient has been experiencing nausea or vomiting and received an antiemetic agent preoperatively, then an agent from a different class should be administered for intraoperative and postoperative antiemetic therapy . The prescription of more than one agent using a tiered approach in the postoperative phase is desirable (as recommended for PONV). Consider antipsychotic/sedative medications earlier in the CVS patient's PONV algorithm.

Anaesthesiologic procedure

Avoid patient's usual triggers.

Nil specific anaesthetic literature beyond 1 adult anaesthetic case report and 4 paediatric patients (1 case report and 1 case series) admitted with resistant CVS requiring anaesthetist intervention.

Consideration of sedative-anxiolytic premedication.

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

Avoid prolonged fasting and dehydration preoperatively and encourage preprocedure fluid intake of balanced oral rehydration solution (if not experiencing an episode). Preoperative glucose and electrolyte monitoring and supplemental intravenous hydration (including glucose supplementation) and correction of electrolyte-acid base derangement as indicated.

Rapid sequence induction of GA when clinically indicated (active vomiting or emergency procedure).

Recommendations are the same as for patients with a high risk of PONV.

Intravenous induction where possible with propofol by standard induction bolus 1-3 mg/kg and during maintenance either infusion at subhypnotic doses, e.g., 120 mcg/kg/h or as total intravenous anaesthesia (TIVA). Minimum triple antiemetic intervention (including dexamethasone particularly, as steroids have been used as abortive therapy) intraoperatively. Consideration of sedative-anxiolytic supplementation prior to emergence depending on dose and agent used preoperatively, e.g., benzodiazepine, alpha-2 adrenergic agonist.

Use of multimodal non-opioid/opioid-sparing analgesia including paracetamol, nonsteroidal anti-inflammatory drugs, local and regional anaesthesia where possible.

Attention to intra- and postoperative electrolytes, glucose and intravenous fluid management aiming for positive fluid balance.

Particular or additional monitoring

Regular assessment of fluid balance, hydration, electrolyte, glucose and renal status if vomiting. Renal impairment can have implications for drug accumulation/toxicity and dosing.

Possible complications

Triggering of a vomiting episode with consequent dehydration and derangement of electrolyte, acid-base balance, glucose and renal function.

Control of postoperative pain and inflammatory response, where possible, to avoid adjunctive triggers is important.

Postoperative care

Usual care with attention to hydration, electrolyte, glucose and renal status if vomiting. Prescription of postoperative fluids including glucose supplementation, with availability of multiple antiemetics and sedatives-anxiolytics, specifying an escalation plan in the event of nausea or frequent vomiting, including acid suppression therapy. As for a patient admitted with migraine, consider nursing the patient in a quiet single room that can be darkened. For nausea and vomiting resistant to intermittent medications, continuous infusions that could be instituted include clonidine (0.15-0.3 mcg/kg/h), dexmedetomidine (0.25-0.5mcg/kg then 0.25 mcg/kg/h), midazolam (0.02 mg/kg/h) and a subhypnotic dose of propofol (as above). Depending on the institution's local practice, the patient may require admission to high dependency care for these infusions and monitoring of their fluid balance.

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

Information about emergency-like situations / Differential diagnostic

The stress of an emergency and or the event of surgery may trigger an episode. The nausea and vomiting of an episode may be indistinguishable from PONV as a complication of anaesthesia and surgery initially, and may then transform into the stereotypical vomiting frequency for the patient.

Differential diagnoses include vertigo, pregnancy (hyperemesis gravidarum), ureteropelvic junction obstruction, nephrolithiasis, migraine (particularly basilar), adrenocortical insufficiency, metabolic genetic disorders such as acute intermittent porphyria, hyperammonaemia or fatty acid oxidation defect (such as an acyl-coenzyme A dehydrogenase deficiency). If the CVS is persistent, or associated with resistant hypoglycaemia (especially if non-ketotic), then specialist metabolic consultation is warranted to direct testing such as for acetylcarnitine and urine organic acid assays (at a time of stress) and gene testing (if indicated). Diabetes mellitus and gastroparesis may be associated with CVS.

Ambulatory anaesthesia

Nil reported. Attention to antiemetic interventions as per non-ambulatory anaesthesia.

Obstetrical anaesthesia

Nil reported.

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

References

1. Abell TL, Adams KA, Boles RG, Bousvaros A, Chong SK, Fleisher DR, Hasler WL, Hyman PE, Issenman RM, Li BU, Linder SL, Mayer EA, McCallum RW, Olden K, Parkman HP, Rudolph CD, Tache Y, Tarbell S, Vakil N. Cyclic vomiting syndrome in adults. Neurogastroenterol Motil 2008;20:269-284
2. Boles RG. High degree of efficacy in the treatment of cyclic vomiting syndrome with combined co-enzyme Q10, L-carnitine and amitriptyline, a case series. BMC Neurol 2011;11:102
3. Boles RG, Zaki EA, Lavenbarg T, Hejazi R, Foran P, Freeborn J, Trilokekar S, McCallum RW. Are pediatric and adult-onset cyclic vomiting syndrome (CVS) biologically different conditions? Relationship of adult-onset CVS with the migraine and pediatric CVS-associated common mtDNA polymorphisms 16519T and 3010A. Neurogastroenterol Motil 2009;21:936-e972
4. Choung RS, Locke GR, Lee RM, Schleck CD, Zinsmeister AR, Talley NJ. Cyclic vomiting syndrome and functional vomiting in adults: association with cannabinoid use in males. Neurogastroenterol Motil 2012;24:20-26,e21
5. Fitzgerald M, Crushell E, Hickey C. Cyclic vomiting syndrome masking a fatal metabolic disease. Eur J Pediatr 2013;172:707-710
6. Gan TJ, Diemunsch P, Habib AS, Kovac A, Kranke P, Meyer TA, Watcha M, Chung F, Angus S, Apfel CC, Bergese SD, Candiotti KA, Chan MT, Davis PJ, Hooper VD, Lagoo-Deenadayalan S, Myles P, Nezat G, Philip BK, Tramer MR. Consensus guidelines for the management of postoperative nausea and vomiting. Anesth Analg 2014;118:85-113
7. Garces J. Anesthetic Considerations for the Patient With Cyclic Vomiting Syndrome. Aana J 2016;84:52-55
8. Grover I, Kim R, Spree DC, Lahr CJ, Kedar A, Kothari S, Fleisher D, Abell TL. Gastric Electrical Stimulation as Potential Treatment in Drug Refractory Cyclic Vomiting Syndrome. J Neurogastroenterol Motil 2016;30;22:643-649.doi:10.5056/jnm15135
9. Hejazi RA, Lavenbarg TH, Foran P, McCallum RW. Who are the nonresponders to standard treatment with tricyclic antidepressant agents for cyclic vomiting syndrome in adults? Aliment Pharmacol Ther 2010;31:295-301
10. Hejazi RA, Lavenbarg TH McCallum RW. Spectrum of gastric emptying patterns in adult patients with cyclic vomiting syndrome. Neurogastroenterol Motil 2010;22:1298-1302, e1338
11. Hejazi RA, McCallum RW. Cyclic vomiting syndrome: treatment options. Exp Brain Res 2014; 232:2549-2552
12. Hejazi RA, Reddymasu SC, Namin F, Lavenbarg T, Foran P, McCallum RW. Efficacy of tricyclic antidepressant therapy in adults with cyclic vomiting syndrome: a two-year follow-up study. J Clin Gastroenterol 2010;44:18-21
13. Hikita T, Kodama H, Ogita K, Kaneko S, Nakamoto N, Mimaki M. Cyclic Vomiting Syndrome in Infants and Children: A Clinical Follow-Up Study. Pediatr Neurol 2016;57:29-33
14. Kaul A, Kaul KK. Cyclic Vomiting Syndrome: A Functional Disorder. Pediatr Gastroenterol Hepatol Nutr 2015;18:224-229
15. Khasawinah TA, Ramirez A, Berkenbosch JW, Tobias JD. Preliminary experience with dexmedetomidine in the treatment of cyclic vomiting syndrome. Am J Ther 2003;10:303-307
16. Kumar N, Bashar Q, Reddy N, Sengupta J, Ananthakrishnan A, Schroeder A, Hogan WJ, Venkatesan T. Cyclic Vomiting Syndrome (CVS): is there a difference based on onset of symptoms--pediatric versus adult? BMC Gastroenterol 2012;12:52
17. Lee KL, Shin JI. Cyclic vomiting syndrome developed after stroke. Ann Rehabil Med 2012;36:141-143
18. Lee LY, Abbott L, Mahlangu B, Moodie SJ, Anderson S. The management of cyclic vomiting syndrome: a systematic review. Eur J Gastroenterol Hepatol 2012;24:1001-1006
19. Lee LY, Abbott L, Moodie S, Anderson S. Cyclic vomiting syndrome in 28 patients: demographics, features and outcomes. Eur J Gastroenterol Hepatol 2012;24:939-943
20. Lewis ML, Palsson OS, Whitehead WE, van Tilburg MA. Prevalence of Functional Gastrointestinal Disorders in Children and Adolescents. J Pediatr 2016;177:39-43.e3.doi: 10.1016/j.jpeds.2016.04.008
21. Li BU, Lefevre F, Chelimsky GG, Boles RG, Nelson SP, Lewis DW, Linder SL, Issenman RM, Rudolph CD. North American Society for Pediatric Gastroenterology and Nutrition (2008). North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition consensus statement on the diagnosis and management of cyclic vomiting syndrome. J Pediatr Gastroenterol Nutr 47: 379-393
22. Millichap JG. Prognosis of Cyclic Vomiting Syndrome. Pediatr Neurol Briefs 2016;30:6

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

23. Moses J, Keilman A, Worley S, Radhakrishnan K, Rothner AD, Parikh S. Approach to the diagnosis and treatment of cyclic vomiting syndrome: a large single-center experience with 106 patients. Pediatr Neurol 2014;50:569-573
24. Palmer GM, Cameron DJ. Use of intravenous midazolam and clonidine in cyclical vomiting syndrome: a case report. Paediatr Anaesth 2005;15:68-72
25. Rothner AD, Parikh S. Migraine Variants or Episodic Syndromes That May Be Associated With Migraine and Other Unusual Pediatric Headache Syndromes. Headache 2016;56: 206-214
26. Sezer OB, Sezer T. A new approach to the prophylaxis of cyclic vomiting: Topiramate. J Neurogastroenterol Motil 2016;30;22:656-660. doi:10.5056/jnm16035
27. Sontineni SP, Chaudhary S, Sontineni V, Lanspa SJ. Cannabinoid hyperemesis syndrome: clinical diagnosis of an underrecognised manifestation of chronic cannabis abuse. World J Gastroenterol 2009;15:1264-1266
28. Stanghellini V, Talley NJ, Chan F, Hasler WL, Malagelada J, Suzuki H, Tack J. Rome IV - Gastroduodenal Disorders. Gastroenterology 2016;150:1380-1392
29. Tarbell S, Li BU. Psychiatric symptoms in children and adolescents with cyclic vomiting syndrome and their parents. Headache 2008;48:259-266
30. To J, Issenman RM, Kamath MV. Evaluation of neurocardiac signals in pediatric patients with cyclic vomiting syndrome through power spectral analysis of heart rate variability. J Pediatr 1999;135:363-366
31. Turchetti A, Guglielmi S, Fossati C, Matrunola M, Corrado G. Gastric emptying time in cyclic vomiting syndrome in children. Eur Rev Med Pharmacol Sci 2004;8(6):295-298
32. Venkatesan T, Tarbell S, Adams K, McKanry J, Barribeau T, Beckmann K, Hogan WJ, Kumar N, Li BU. A survey of emergency department use in patients with cyclic vomiting syndrome. BMC Emerg Med 2010;10:4
33. Yang HR. Recent concepts on cyclic vomiting syndrome in children. J Neurogastroenterol Motil 2010;16:139-147.

Links

http://www.romecriteria.org/assets/pdf/19_RomeIII_apA_885-898.pdf

http://www.ihs-classification.org/_downloads/mixed/International-Headache-Classification-III-ICHD-III-2013-Beta.pdf

Last date of modification: December 2016

This guideline has been prepared by:

Author
Greta M Palmer, Department of Anaesthesia and Pain Management, Royal Children's Hospital, Melbourne, Victoria, Australia

Peer revision 1
Cinzia Cavestro, Headache Center, San Lazzaro Hospital, Alba (CN), Italy

Peer revision 2
Nicholas J. Talley, Professor of Medicine, Faculty of Health and Medicine, Global Research, University of Newcastle, Australia

© Anästh Intensivmed 2025;66:S98–S107 Aktiv Druck & Verlag GmbH

Herausgeber

DGAI
Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin e. V.
Präsident: Prof. Dr. G. Marx, Aachen

BDA
Berufsverband Deutscher Anästhesistinnen und Anästhesisten e. V.
Präsidentin: Prof. Dr. G. Beck, Mannheim

Schriftleitung
Präsident/in der Herausgeberverbände

Gesamtschriftleiter/Editor-in-Chief:
Prof. Dr. Dr. Kai Zacharowski, ML FRCA FESAIC, Frankfurt

Stellvertretender Gesamtschriftleiter/Deputy Editor:
Prof. Dr. T. Volk, Homburg/Saar

CME-Schriftleiter/CME-Editor:
Prof. Dr. W. Zink, Ludwigshafen

Redaktionskomitee/Editorial Board
Priv.-Doz. Dr. E. Adam, Frankfurt
Prof. Dr. M. Adamzik, Bochum
Dr. J. Aulenkamp, Essen
Prof. Dr. G. Beck, Mannheim
Prof. Dr. T. Brenner, Essen
Prof. Dr. A. Brinkmann, Heidenheim
Prof. Dr. M. Coburn, Bonn
Prof. Dr. S.M. Coldewey, Jena
Prof. Dr. V. von Dossow, Bad Oeynhausen
Prof. Dr. B. Ellger, Dortmund
Prof. Dr. K. Engelhard, Mainz
Prof. Dr. M. Fischer, Göppingen
Prof. Dr. D. Fries, Innsbruck
Prof. Dr. K. Hahnenkamp, Greifswald
Prof. Dr. A.R. Heller, Augsburg
Prof. Dr. B. Jungwirth, Ulm
Prof. Dr. T. Loop, Freiburg
Prof. Dr. K. Meissner, Göttingen
Prof. Dr. W. Meißner, Jena
Prof. Dr. P. Meybohm, Würzburg
Prof. Dr. T. Müller-Wolff, Ludwigsburg
Prof. Dr. H. Mutlak, Offenbach
Prof. Dr. C. Nau, Lübeck
Priv.-Doz. Dr. V. Neef, Frankfurt
Prof. Dr. B. O'Brien, Berlin
Dr. B. Oehler, Heidelberg
Prof. Dr. S.G. Sakka, Koblenz
Prof. Dr. M. Sander, Gießen
Prof. Dr. B. Saugel, Hamburg
Prof. Dr. S. Schäfer, Oldenburg
Priv.-Doz. Dr. H. Schöchl, Salzburg
Prof. Dr. A. Steinbicker, Köln
Dr. M.T. Völker, Leipzig
Prof. Dr. N.-M. Wagner, Würzburg
Prof. Dr. F. Wappler, Köln
Prof. Dr. M. Weigand, Heidelberg

Redaktion/Editorial Staff
Korrespondenzadresse:
Neuwieder Straße 9 | 90411 Nürnberg | Deutschland | Tel.: 0911 9337812
E-Mail: redaktion@ai-online.info

Verlag & Druckerei

Aktiv Druck & Verlag GmbH
An der Lohwiese 36 |
97500 Ebelsbach | Deutschland
www.aktiv-druck.de

Geschäftsführung
Wolfgang Schröder | Jan Schröder | Nadja Schwarz
Tel.: 09522 943560 | Fax: 09522 943567
E-Mail: info@aktiv-druck.de

Anzeigen | Vertrieb
Pia Müller | Robert Kux
Tel.: 09522 943570 | Fax: 09522 943577
E-Mail: anzeigen@aktiv-druck.de

Verlagsrepräsentanz
Jürgen Distler
Neuwieder Straße 9 | 90411 Nürnberg
Tel.: 0171 9432534
E-Mail: jdistler@bda-ev.de

Herstellung | Gestaltung
Pia Müller | Robert Kux | Stefanie Triebert
Tel.: 09522 943570 | Fax: 09522 943577
E-Mail: ai@aktiv-druck.de

Titelbild
Gestaltung: Klaus Steigner
Paumgartnerstraße 28 | 90429 Nürnberg
E-Mail: mazyblue@klaus-steigner.de
www.klaus-steigner.de

Erscheinungsweise 2025
Der 66. Jahrgang erscheint jeweils zum Monatsanfang, Heft 7/8 als Doppelausgabe.

Bezugspreise (inkl. Versandkosten):

• **Einzelhefte**	30,- €
• **Jahresabonnement:**	
Europa (ohne Schweiz) (inkl. 7 % MwSt.)	258,- €
Schweiz	266,- €
Rest der Welt	241,- €
Mitarbeiter aus Pflege, Labor, Studenten und Auszubildende (bei Vorlage eines entsprechenden Nachweises)	
Europa (ohne Schweiz) (inkl. 7 % MwSt.)	94,- €
Schweiz	90,- €
Rest der Welt	94,- €

Für Mitglieder der DGAI und/oder des BDA ist der Bezug der Zeitschrift im Mitgliedsbeitrag enthalten.

Allgemeine Geschäfts- und Lieferbedingungen
Die allgemeinen Geschäfts- und Lieferbedingungen entnehmen Sie bitte dem Impressum auf www.ai-online.info

Indexed in **CINAHL; Current Contents®/ Clinical Medicine, EBSCO; EMBASE/ Excerpta Medica; Medical Documentation Service; Research Alert; Sci Search; Scopus; SUBIS Current Awareness in Biomedicine; VINITI: Russian Academy of Science.**

Die Beiträge aus der A&I finden Sie online unter:
www.ai-online.info

CONTACT US

Please do not hesitate to contact us. We will be glad to answer and provide further information to you at any time.

.....
Name

.....
First Name

.....
Department / Hospital

.....
Place

.....
Telephone

.....
E-Mail

.....
Date / Signature

Please contact me for further information ○

I would like to participate in the project ○

ADDRESS

German Society of Anaesthesiology and
Intensive Care Medicine
Neuwieder Straße 9 | 90411 Nuremberg | Germany
Tel.: +49-911-933780
Email: info@orphananesthesia.eu