



Microstream™ Capnography Clinical Evidence Bibliography

Microstream™ Capnography Clinical Evidence Bibliography

Covidien is dedicated to delivering customers comprehensive monitoring solutions that are accurate, improve patient safety and enhance clinician efficiency. The nearly 150 studies in this bibliography highlight the benefits of Microstream capnography in a wide variety of patients.

Our mission is to create and deliver innovative healthcare solutions, developed in ethical collaboration with medical professionals, which enhance the quality of life for patients and improve outcomes for our customers. That's why we are dedicated to ensuring that our solutions have been tested and reviewed not only by Covidien, but also by independent, objective healthcare researchers.

2013

Authors	Titles	Citation	URL
Arakawa H, Kaise M, Sumiyama K, Saito S, Suzuki T, Tajiri H	Does pulse oximetry accurately monitor a patient's ventilation during sedated endoscopy under oxygen supplementation?	<i>Singapore Med J.</i> 2013;54(4):212-215.	http://www.ncbi.nlm.nih.gov/pubmed/23624448
Belenkiy S, Ivey KM, Batchinsky AI, Langer T, Necsoiu C, Baker W, Salinas J, Cancio LC	Noninvasive carbon dioxide monitoring in a porcine model of acute lung injury due to smoke inhalation and burns.	<i>Shock.</i> 2013;39(6):495-500.	http://www.ncbi.nlm.nih.gov/pubmed/23572088
Chen WH, Ye JY, Zhang YH, Wang JY	Application of pressure of end-tidal carbon dioxide concentration in polysomnography.	<i>Zhonghua Er Bi Yan Hou Tou Jing Wai Ke Za Zhi.</i> 2013;48(2):158-160.	http://www.ncbi.nlm.nih.gov/pubmed/23710868
Hunter CL, Silvestri S, Dean M, Falk JL, Papa L	End-tidal carbon dioxide is associated with mortality and lactate in patients with suspected sepsis.	<i>Am J Emerg Med.</i> 2013;31(1):64-71.	http://www.ncbi.nlm.nih.gov/pubmed/22867820
Tingay DG, Mun KS, Perkins EJ	End tidal carbon dioxide is as reliable as transcutaneous monitoring in ventilated postsurgical neonates.	<i>Arch Dis Child Fetal Neonatal Ed.</i> 2013;98(2):F161-F164.	http://www.ncbi.nlm.nih.gov/pubmed/22887048
Zhang C, Wang M, Wang R, Wang W	Accuracy of end-tidal CO ₂ measurement through the nose and pharynx in nonintubated patients during digital subtraction cerebral angiography.	<i>J Neurosurg Anesthesiol.</i> 2013;25(2):191-196.	http://www.ncbi.nlm.nih.gov/pubmed/23269088

2012

Authors	Titles	Citation	URL
Beitz A, Riphaut A, Meining A, Kronshage T, Geist C, Wagenpfeil S, Weber A, Jung A, Bajbouj M, Pox C, Schneider G, Schmid RM, Wehrmann T, von Delius S	Capnographic monitoring reduces the incidence of arterial oxygen desaturation and hypoxemia during propofol sedation for colonoscopy: a randomized, controlled study (ColoCap Study).	<i>Am J Gastroenterol.</i> 2012;107(8):1205-1212.	http://www.ncbi.nlm.nih.gov/pubmed/22641306
Berkenstadt H, Ben-Menachem E, Herman A, Dach R	An evaluation of the Integrated Pulmonary Index (IPI) for the detection of respiratory events in sedated patients undergoing colonoscopy.	<i>J Clin Monit Comput.</i> 2012;26(3):177-181.	http://www.ncbi.nlm.nih.gov/pubmed/22454276
Bluhm DC, Yuen TC, Edelson DP	Characterizing continuous capnography at the onset of return of spontaneous circulation.	<i>Circulation.</i> 2012;126:A189.	
Bradley B, Green GC, Batkin I, Seely AJ	Feasibility of continuous multiorgan variability analysis in the intensive care unit.	<i>J Crit Care.</i> 2012;27(2):218.e9-e20.	http://www.ncbi.nlm.nih.gov/pubmed/22172799
Dungan G, Colman J, Lain D	Evaluation of oxygen delivery via a novel smart capnoline delivery system during simultaneous oxygen therapy and carbon dioxide monitoring.	<i>Anesth Analg.</i> 2012;115(suppl 2S):S20.	
Gaidukov K, Rajbuzhis E, Hussain A, Teterin A, Kirov M	The intra-abdominal pressure and respiratory function in patients after repair of ventral hernia: 12AP4-4.	<i>Eur J Anaesthesiol.</i> 2012;29(Suppl 50):183-184.	
Helfenbein E, Firoozabadi R, Babaeizadeh S, Daya M	Intentional or inadvertent hyperventilation of patients with out-of-hospital cardiac arrest on hospital arrival.	<i>Circulation.</i> 2012;126:A261.	
Holmes J, Peng J, Bair A	Abnormal end-tidal carbon dioxide levels on emergency department arrival in adult and pediatric intubated patients.	<i>Prehosp Emerg Care.</i> 2012;16(2):210-216.	http://www.ncbi.nlm.nih.gov/pubmed/22217189

Kheng CP, Rahman NH	The use of end-tidal carbon dioxide monitoring in patients with hypotension in the emergency department.	<i>Int J Emerg Med.</i> 2012;5(1):31.	http://www.ncbi.nlm.nih.gov/pubmed/22828152
Kugelman A, Riskin A, Shoris I, Ronen M, Stein IS, Bader D	Continuous integrated distal capnography in infants ventilated with high frequency ventilation.	<i>Pediatr Pulmonol.</i> 2012;47(9):876-883.	http://www.ncbi.nlm.nih.gov/pubmed/22328495
Kuzkov V, Fot E, Gaidukov K, Neverova M, Kirov M	Integrated pulmonary index (IPI) is associated with duration of postoperative respiratory support after coronary artery bypass grafting and body mass index: 5AP4-6.	<i>Eur J Anaesthesiol.</i> 2012;29(suppl 50):90.	
Miner J, Moore J, Cole JB	The use of end-tidal CO ₂ monitoring in patients undergoing observation for sedative overdose in the emergency department.	<i>Acad Emerg Med.</i> 2012;19(suppl s1):S37.	
Whitesell PL, Dungan GC, Chaudhary BA, Pearce J, Lain D	A novel marker of sleep disordered breathing: a pilot study of a pulmonary index.	<i>Sleep.</i> 2012;35(suppl abstract):A439.	

2011

Authors	Titles	Citation	URL
Castresana M, Whiddon S, Herrington R, Waller J, Taft A	Prospective comparison of the integrated pulmonary index (Ipi™) to results from weaning evaluations in cardiac surgery patients.	<i>Crit Care Med.</i> 2011;39(12):226.	
Colman J, Shalev I, Ronen M, Weissbrod R, Lain D	A pilot evaluation of a novel screening tool for sleep related breathing disorders.	<i>Anesth Analg.</i> 2011;112(suppl 2S):7.	
Deitch K, Chudnofsky CR, Dominici P, Latta D, Salamanca Y	The utility of high-flow oxygen during emergency department procedural sedation and analgesia with propofol: a randomized, controlled trial.	<i>Ann Emerg Med.</i> 2011;58(4):360-364.e3.	http://www.ncbi.nlm.nih.gov/pubmed/21680059
von Delius S, Beitz A, Meining A, Wagenpfeil S, Schneider G, Schmid RM, Wehrmann T, Riphaus A	Capnography improves patient safety during propofol sedation for colonoscopy: a randomized, controlled study (ColoCap study).	<i>Anesthesiology.</i> 2011;115:A1657.	
Einav S, Bromiker R, Weiniger CF, Matot I	Mathematical modeling for prediction of survival from resuscitation based on computerized continuous capnography: proof of concept.	<i>Acad Emerg Med.</i> 2011;18(5):468-475.	http://www.ncbi.nlm.nih.gov/pubmed/21569166
Einav S, Helvitz Y, Hersch M, Ronen M	Physiological differences in end tidal CO ₂ in the prone and supine positions in spontaneously breathing volunteers.	<i>Anesthesiology.</i> 2011;115:A1456.	
Hemnes AR, Pugh ME, Newman AL, Robbins IM, Tolle J, Austin ED, Newman JH	End tidal CO ₂ tension: pulmonary arterial hypertension vs pulmonary venous hypertension and response to treatment.	<i>Chest.</i> 2011;140(5):1267-1273.	http://www.ncbi.nlm.nih.gov/pubmed/21622547
Jamal G, Adv OE, Rosen I, Shaoul R	The value of integrated pulmonary index (IPI) monitoring during endoscopies in children.	<i>Gastrointest Endosc.</i> 2011; 73(suppl 4):AB221.	
Kannikeswaran N, Chen X, Sethuraman U	Utility of endtidal carbon dioxide monitoring in detection of hypoxia during sedation for brain magnetic resonance imaging in children with developmental disabilities.	<i>Paediatr Anaesth.</i> 2011;21(12):1241-1246.	http://www.ncbi.nlm.nih.gov/pubmed/21824212
Keidan I, Ben-Menachem E, Barzilai A, Nur I, Berkenstadt H	Intravenous sodium bicarbonate verifies intravenous position of catheters in ventilated patients.	<i>Anesth Analg.</i> 2011;113(2):279-281.	http://www.ncbi.nlm.nih.gov/pubmed/21642603
Kugelman A, Riskin A, Shoris I, Ronen M, Stein IS, Bader D	Continuous integrated distal capnography in premature infants ventilated with high frequency ventilation: it is feasible.	2011; E-PAS2011: 266.	
Kusakari M, Nakayama Y, Horiuchi A, Hidaka N, Kato S, Koike K	A pilot study to assess the safety and efficacy of carbon dioxide insufflation in sedated pediatric endoscopy.	<i>Gastrointest Endosc.</i> 2011;73(suppl 4):AB220-AB221.	
Kuzkov VV, Gaidukov KM, Fot EV, Neverova MS, Smetkin AA, Kirov MY	Integrated pulmonary index reflects respiratory function after elective coronary artery bypass grafting: 5AP4-5.	<i>Eur J Anaesthesiol.</i> 2011;28(suppl 48):78.	
Langhan ML, Chen L, Marshall C, Santucci KA	Detection of hypoventilation by capnography and its association with hypoxia in children undergoing sedation with ketamine.	<i>Pediatr Emerg Care.</i> 2011;27(5):394-397.	http://www.ncbi.nlm.nih.gov/pubmed/21494162
Lopez E, Mathlouthi J, Lescure S, Krauss B, Jarreau PH, Moriette G	Capnography in spontaneously breathing preterm infants with bronchopulmonary dysplasia.	<i>Pediatr Pulmonol.</i> 2011;46(9):896-902.	http://www.ncbi.nlm.nih.gov/pubmed/21465676
Ritz T, Simon E, Trueba AF	Stress-induced respiratory pattern changes in asthma.	<i>Psychosom Med.</i> 2011;73(6):514-521.	http://www.ncbi.nlm.nih.gov/pubmed/21715298

Rousselon S, Coat M, Nguyen BV, Gouny P, Nowak E, Wargnier JP, Arvieux CC, Gueret G	Comparison between ETCO ₂ values measured by the Smart Capnoline™ and the PACO ₂ in intubated then extubated postoperative cardiac surgery patients [in French].	<i>Ann Fr Anesth Reanim.</i> 2011;30(1):13-16.	http://www.ncbi.nlm.nih.gov/pubmed/21190808
Sabbatani P, Baraldi P, Zennaro R	Electrical cardioversion of atrial fibrillation: evaluation of safety of sedation with Midazolam by means of ETCO ₂ and Ipialgorythm analysis.	<i>J Cardiovasc Electrophysiol.</i> 2011;22(s1):S5.	
Shaoul R	The value of integrated pulmonary index (IPI) monitoring during endoscopies in children.	<i>Anesth Analg.</i> 2011; 113(suppl 2S):22.	
Wales R, Dyott W	Analysis of the efficacy of waveform capnography monitoring using bag-valve-mask ventilation.	<i>Anesth Analg.</i> 2011;113(2S_Suppl):35.	
Weihu C, Jingying Y, Demin H, Yuhuan Z, Jiangyong W	End-tidal carbon dioxide concentration monitoring in obstructive sleep apnea patients.	<i>Am J Otolaryngol.</i> 2011;32(3):190-193.	http://www.ncbi.nlm.nih.gov/pubmed/20466453

2010

Authors	Titles	Citation	URL
Deitch K, Miner J, Chudnofsky CR, Dominici P, Latta D	Does end tidal CO ₂ monitoring during emergency department procedural sedation and analgesia with propofol decrease the incidence of hypoxic events? A randomized, controlled trial.	<i>Ann Emerg Med.</i> 2010;55(3):258-264.	http://www.ncbi.nlm.nih.gov/pubmed/19783324
Delerme S, Freund Y, Renault R, Devilliers C, Castro S, Chopin S, Juillien G, Riou B, Ray P	Concordance between capnography and capnia in adults admitted for acute dyspnea in an ED.	<i>Am J Emerg Med.</i> 2010;28(6):711-714.	http://www.ncbi.nlm.nih.gov/pubmed/20637388
Einav S, Helvitz Y, Ronen M, Hersch M	The IPI identifies the window of opportunity for treatment before cardio-respiratory arrest.	<i>Resuscitation.</i> 2010;81(suppl 2):S42.	
Frattari A, Cacciafiori G, Isacco V, Baldassarre N, Spina T	Microstream capnography improves patient monitoring during deep sedation.	<i>Digest Liver Disease.</i> 2010;42(suppl 5):S330.	
Gozal D, Cohen M, Wengrower D, Dancour A	Quantitative and qualitative assessment of the oxygen delivery and EtCO ₂ sampling during an upper endoscopy procedure with the Oridion smart capnoline guardian.	<i>Gastrointest Endosc.</i> 2010;71(5):AB233.	
Hemnes AR, Newman AL, Rosenbaum B, Barrett TW, Zhou C, Rice TW, Newman JH	Bedside end-tidal CO ₂ tension as a screening tool to exclude pulmonary embolism.	<i>Eur Respir J.</i> 2010;35(4):735-741.	http://www.ncbi.nlm.nih.gov/pubmed/19717480
Hill J	Integrated pulmonary index as a possible screening tool for pulmonary disease.	<i>Respir Care.</i> 2010;55(11):1519.	
Kugelman A, Riskin A, Shoris I, Bader D	Capnography in premature Infants ventilated with high frequency ventilation: a pilot study.	Presented at: Annual Meeting of the Pediatric Academic Societies; May 1-4, 2010; Vancouver, British Columbia, Canada.	
Lightdale JR, Fredette ME, Atmadja ML, Heard L, Jiang H	Pilot study of the smart capnography integrated pulmonary index in a pediatric gastroenterology procedure unit.	<i>Gastrointest Endosc.</i> 2010;71(5):AB255.	
Navarro LH, Lima RM, Kinsky MP, Salter M, Kramer GC	Traditional vital signs versus muscle O ₂ (StO ₂) versus central venous O ₂ (ScvO ₂) as early indicators of hypovolemia in a swine model.	<i>Anesth Analg.</i> 2010;110(suppl 3S):S-125.	
Urbano J, Cruzado V, López-Herce J, del Castillo J, Bellón JM, Carrillo A	Accuracy of three transcutaneous carbon dioxide monitors in critically ill children.	<i>Pediatr Pulmonol.</i> 2010;45(5):481-486.	http://www.ncbi.nlm.nih.gov/pubmed/20425856
Waugh JB, Taft AA, Niebel KH	Analysis of abnormal events identified by the integrated pulmonary index in normal adults during noninvasive positive pressure ventilation.	<i>Prehosp Emerg Care.</i> 2010;14(s1):30.	
Waugh JB, Vines DL, Gardner DD, Wettstein RB	Integrated pulmonary index stability in healthy adults under changing conditions.	<i>Respir Care.</i> 2010;55(11):1522.	

Authors	Titles	Citation	URL
Ansarin K, Niroomand B, Aghamohammadzadeh N, Najafipour F, Niafar M	End tidal CO ₂ levels in subclinical and overt hypothyroidism are lower than healthy control subjects and the level is not related to thyroid function tests.	<i>Chest</i> . 2009;136(4_MeetingAbstracts):124S.	
Brothers RM, Wingo JE, Hubing KA, Crandall CG	The effects of reduced end-tidal carbon dioxide tension on cerebral blood flow during heat stress.	<i>J Physiol</i> . 2009;587(Pt 15):3921-3927.	http://www.ncbi.nlm.nih.gov/pubmed/19528251
Gozal D, Gozal Y	The integrated pulmonary index: validity, safety and application in the pediatric population.	Presented at: Annual Meeting of the American Society of Anesthesiologists; October 17-21, 2009; New Orleans, La.	
Gozal D, Gozal Y	Validation of the integrated pulmonary index in the post anesthesia care unit.	<i>Eur J Anaesthesiol</i> . 2009;26(Sup 45):36.	
Gozal D, Gozal Y	Reliability of the integrated pulmonary index postoperatively.	Presented at: Annual Meeting of the Society for Technology in Anesthesia and Computers in Anesthesia Meeting; January 14-19, 2009; San Antonio, Texas.	
Gozal D, Gozal Y	The integrated pulmonary index: validity and application in the pediatric population.	Presented at: Annual Meeting of the Society for Technology in Anesthesia and Computers in Anesthesia Meeting; January 14-19, 2009; San Antonio, Texas.	
Hockman S, Glembot T, Niebel K	Comparison of capnography derived respiratory rate alarm frequency using the SARA algorithm versus an established non-adaptive respiratory rate alarm management algorithm in bariatric surgical patients.	<i>Respir Care</i> . 2009; 54(11):1582.	
Hosono S, Inami I, Fujita H, Minato M, Takahashi S, Mugishima H	A role of end-tidal CO ₂ monitoring for assessment of tracheal intubations in very low birth weight infants during neonatal resuscitation at birth.	<i>J Perinat Med</i> . 2009;37(1):79-84.	http://www.ncbi.nlm.nih.gov/pubmed/18976048
Kasuya Y, Akça O, Sessler DI, Ozaki M, Komatsu R	Accuracy of postoperative end-tidal Pco ₂ measurements with mainstream and sidestream capnography in non-obese patients and in obese patients with and without obstructive sleep apnea.	<i>Anesthesiology</i> . 2009;111(3):609-615.	http://www.ncbi.nlm.nih.gov/pubmed/19672177
Lain D, Bourn S	Quality assurance report on the use of continuous positive airway pressure and end-tidal carbon dioxide during respiratory distress in field emergency care.	<i>Critical Care</i> . 2009;13(suppl 1):P6.	
Lopez E, Grabar S, Barbier A, Krauss B, Jarreau PH, Moriette G	Detection of carbon dioxide thresholds using low-flow sidestream capnography in ventilated preterm infants.	<i>Intensive Care Med</i> . 2009;35(11):1942-1949.	http://www.ncbi.nlm.nih.gov/pubmed/19760396
Moses JM, Alexander JL, Agus MS	The correlation and level of agreement between end-tidal and blood gas pCO ₂ in children with respiratory distress: a retrospective analysis.	<i>BMC Pediatr</i> . 2009;9:20.	http://www.ncbi.nlm.nih.gov/pubmed/19284617
Peng JS, Holmes JF	Out-of-hospital intubations: are patients well ventilated on emergency department arrival?	<i>Ann Emerg Med</i> . 2009;54(suppl 3):S139.	
Qadeer MA, Vargo JJ, Dumot JA, Lopez R, Trolli PA, Stevens T, Parsi MA, Sanaka MR, Zuccaro G	Capnographic monitoring of respiratory activity improves safety of sedation for endoscopic cholangiopancreatography and ultrasonography.	<i>Gastroenterology</i> . 2009;136(5):1568-1576; quiz 1819-1820.	http://www.ncbi.nlm.nih.gov/pubmed/19422079
Sakata DJ, Matsubara I, Gopalakrishnan NA, Westenskow DR, White JL, Yamamori S, Egan TD, Pace NL	Flow-through versus sidestream capnometry for detection of end tidal carbon dioxide in the sedated patient.	<i>J Clin Monit Comput</i> . 2009;23(2):115-122.	http://www.ncbi.nlm.nih.gov/pubmed/19301133
Suborov EV, Postnikova EA, Kapinos AA, Kuz'kov VV, Smetkin AA, Kirov Mlu	Use of microstream capnography and alveolar recruitment during off-pump coronary artery bypass grafting [in Russian].	<i>Anesteziol Reanimatol</i> . 2009;(4):17-22.	http://www.ncbi.nlm.nih.gov/pubmed/19824412
Taft A, Waugh J, Pippin G	Influence of sampling site on end tidal carbon dioxide levels (PETCO ₂) during non-invasive positive pressure ventilation (NPPV).	<i>Respir Care</i> . 2009;54(11):1547.	
Yarchi D, Cohen A, Umansky T, Sukhotnik I, Shaoul R	Assessment of end-tidal carbon dioxide during pediatric and adult sedation for endoscopic procedures.	<i>Gastrointest Endosc</i> . 2009;69(4):877-882.	http://www.ncbi.nlm.nih.gov/pubmed/19019361

2008

Authors	Titles	Citation	URL
Ab-Rahman NH, Howe TA	A comparison of capnographic waveform indices and peak flow meter in the monitoring of asthmatic patients in emergency departments.	<i>Ann Emerg Med.</i> 2008;51(4):476-477.	
Ab-Rahman NH, Mamat AF, Ahmad R, Noh AY, Jaalam K	A study on the use of nasal capnometry in patients presented with acute breathlessness in the emergency department.	<i>Ann Emerg Med.</i> 2008;51(4):534-535.	
Carr-Locke DL, Walsh S	Capnography in upper gastrointestinal endoscopy with the Oridion bitebloc.	<i>Anesthesiology.</i> 2008;109:A1684.	
Colman J, Cohen J, Lain D	Smart alarm respiratory analysis (SARA™) used in capnography to reduce alarms during spontaneous breathing.	<i>Anesth Analg.</i> 2008;106(suppl 4S):S-10.	
Deitch K, Chudnofsky CR, Dominici P	The utility of supplemental oxygen during emergency department procedural sedation with propofol: a randomized, controlled trial.	<i>Ann Emerg Med.</i> 2008;52(1):1-8.	http://www.ncbi.nlm.nih.gov/pubmed/18294729
Gehring H, Landsmann S, Opp A, Boye S.	Capnometer accuracy with ambient and body conditions.	<i>Anesthesiology.</i> 2008;109:A1479.	
Gehring H, Landsmann S, Opp A, Sedemund-Adib B, Boye S	Accuracy of capnometry in critically ill adult patients.	<i>Anesthesiology.</i> 2008;109:A1687.	
Hutchison R, Rodriguez L	Capnography and respiratory depression.	<i>Am J Nurs.</i> 2008;108(2):35-39.	http://www.ncbi.nlm.nih.gov/pubmed/18227667
Kugelman A, Zeiger-Aginsky D, Bader D, Shoris I, Riskin A	A novel method of distal end-tidal CO ₂ capnography in intubated infants: comparison with arterial CO ₂ and with proximal mainstream end-tidal CO ₂ .	<i>Pediatrics.</i> 2008;122(6):e1219-e1224.	http://www.ncbi.nlm.nih.gov/pubmed/19029196
Langhan ML, Zonfrillo MR, Spiro DM	Quantitative end-tidal carbon dioxide in acute exacerbations of asthma.	<i>J Pediatr.</i> 2008;152(6):829-832.	http://www.ncbi.nlm.nih.gov/pubmed/18492526
McNaughton GW, Stewart G	Nasal capnography monitoring: making sedation safer in the emergency department.	<i>Ann Emerg Med.</i> 2008;51(4):548-549.	
Taft A, Ronen M, Epps C, Waugh J, Wales R	A novel integrated pulmonary index (IPI) quantifies heart rate, Etc _{o2} , respiratory rate and Spo ₂ %.	<i>Anesthesiology.</i> 2008;109:A1682.	
Vetorello M, Colombo R, De Grandis CE, Costantini E, Raimondi F	Effect of fentanyl on heart rate variability during spontaneous and paced breathing in healthy volunteers.	<i>Acta Anaesthesiol Scand.</i> 2008;52(8):1064-1070.	http://www.ncbi.nlm.nih.gov/pubmed/18840105

2007

Authors	Titles	Citation	URL
Bazin J	Detection of respiratory depression prior to evidence of hypoxemia in procedural sedation.	<i>Respir Care.</i> 2007;52:1568.	
Bogaerts K, Hubin M, Van Diest I, De Peuter S, Van Houdenhove B, Van Wambeke P, Crombez G, Van den Bergh O	Hyperventilation in patients with chronic fatigue syndrome: the role of coping strategies.	<i>Behav Res Ther.</i> 2007;45(11):2679-690.	http://www.ncbi.nlm.nih.gov/pubmed/17719001
Coté CJ, Wax DF, Jennings MA, Gorski CL, Kurczak-Klippstein K	Endtidal carbon dioxide monitoring in children with congenital heart disease during sedation for cardiac catheterization by nonanesthesiologists.	<i>Paediatr Anaesth.</i> 2007;17(7):661-666.	http://www.ncbi.nlm.nih.gov/pubmed/17564648
Desmarchelier M, Rondenay Y, Fitzgerald G, Lair S	Monitoring of the ventilatory status of anesthetized birds of prey by using end-tidal carbon dioxide measured with a microstream capnometer.	<i>J Zoo Wildl Med.</i> 2007;38(1):1-6.	http://www.ncbi.nlm.nih.gov/pubmed/17469268
McCarter T, Shaik Z, Scarfo K, Laura T	End-tidal carbon dioxide monitoring in patient controlled analgesia.	<i>Respir Care.</i> 2007;52:1567.	
Nuccio P, Hochstetler G, Jackson M	End-tidal CO ₂ measurements with noninvasive ventilation.	<i>Anesth Analg.</i> 2007;105(suppl 6S):S111.	
Overdyk FJ, Beeson H, Hunter C, Callura J, Gaines I	Breath to breath variability during deep sedation may be indicative of partial airway obstruction.	<i>Anesthesiology.</i> 2007;107:A101.	
Overdyk FJ, Carter R, Maddox RR, Callura J, Herrin AE, Henriquez C	Continuous oximetry/capnometry monitoring reveals frequent desaturation and bradypnea during patient-controlled analgesia.	<i>Anesth Analg.</i> 2007;105(2):412-418.	http://www.ncbi.nlm.nih.gov/pubmed/17646499

Wales RA	Analysis of environment and population during Microstream™ sidestream capnography utilization.	<i>Respir Care.</i> 2007;52(11):84.	
Waugh JB, Beckett C, Stanley SA, Stalcup TR, Nichols R, Niebel KH, Granger WM	The effect of altitude on end-tidal carbon dioxide measurement using the Alaris ETCO ₂ capnography module in normal subjects.	<i>Respir Care.</i> 2007;52(11):1569.	
Waugh JB, Stanley SA, Beckett C, Niebel KH, Wright EL, Granger WM	Comparison of apnea detection by pulse oximetry versus capnography.	<i>Respir Care.</i> 2007;52:1556.	http://www.rcjournal.com/abstracts/2007/index.cfm?id=aarc07_147

2006

Authors	Titles	Citation	URL
Burton JH, Harrah JD, Germann CA, Dillon DC	Does end-tidal carbon dioxide monitoring detect respiratory events prior to current sedation monitoring practices?	<i>Acad Emerg Med.</i> 2006;13(5):500-504.	http://www.ncbi.nlm.nih.gov/pubmed/16569750
Lightdale JR, Goldmann DA, Feldman HA, Newburg AR, DiNardo JA, Fox VL	Microstream capnography improves patient monitoring during moderate sedation: a randomized, controlled trial.	<i>Pediatrics.</i> 2006;117(6):e1170-e1178.	http://www.ncbi.nlm.nih.gov/pubmed/16702250
Lukic KZ, Urch B, Fila M, Faughnan ME, Silverman F	A novel application of capnography during controlled human exposure to air pollution.	<i>Biomed Eng Online.</i> 2006;5:54.	http://www.ncbi.nlm.nih.gov/pubmed/17049094
Pang DS, Rondenay Y, Troncy E, Measures LN, Lair S	Use of end-tidal partial pressure of carbon dioxide to predict arterial partial pressure of carbon dioxide in harp seals during isoflurane-induced anesthesia.	<i>Am J Vet Res.</i> 2006;67(7):1131-1135.	http://www.ncbi.nlm.nih.gov/pubmed/16817732
Singh S, Allen WD Jr, Venkataraman ST, Bhende MS	Utility of a novel quantitative handheld microstream capnometer during transport of critically ill children.	<i>Am J Emerg Med.</i> 2006;24(3):302-307.	http://www.ncbi.nlm.nih.gov/pubmed/16635702
Tsianos G, Woolrich-Burt L, Aitchison T, Peacock A, Watt M, Montgomery H, Watt I, Grant S	Factors affecting a climber's ability to ascend Mont Blanc.	<i>Eur J Appl Physiol.</i> 2006;96(1):32-36.	http://www.ncbi.nlm.nih.gov/pubmed/16235066

2005

Authors	Titles	Citation	URL
Efrati S, Leonov Y, Oron A, Siman-Tov Y, Averbukh M, Lavrushevich A, Golik A	Optimization of endotracheal tube cuff filling by continuous upper airway carbon dioxide monitoring.	<i>Anesth Analg.</i> 2005;101(4):1081-1088, table of contents.	http://www.ncbi.nlm.nih.gov/pubmed/16192525
Gehring H, Stein N, Ahmad F, Matz H, Hofmann U	Intelligent analysis of capnograms in spontaneously breathing patients.	<i>Anesthesiology.</i> 2005;103:A852.	
Hancock J, Nylander D, Fowler L, Rowland RS, Bell GD	Could capnography play any useful role in monitoring sedated patients on an endoscopy unit?	<i>Gut.</i> 2005;54(suppl 2):A64.	
Krauss B, Deykin A, Lam A, Ryoo JJ, Hampton DR, Schmitt PW, Falk JL	Capnogram shape in obstructive lung disease.	<i>Anesth Analg.</i> 2005;100(3):884-888, table of contents.	http://www.ncbi.nlm.nih.gov/pubmed/15728084
Nagler J, Wright RO, Krauss B	End-tidal carbon dioxide as a measure of acidosis in children with dehydration.	<i>Pediatr Emerg Care.</i> 2005;21(8):552-553.	
Ngo K, Klooster M, Yanni G, Shah M	Capnography detects sub-clinical altered respiratory events not detected by routine monitoring in children undergoing EGD with procedural sedation: 119*.	<i>JPGN.</i> 2005;41(4):529-530.	
Ngo K, Klooster M, Yanni G, Shah M	Capnography in children undergoing esophagogastroduodenoscopy (EGD) with deep sedation.	Presented at: Annual meeting of the Pediatric Academic Society; May 14-17, 2005; Washington, DC.	
Ong HT, Lim KJL, Low PC, Tay SKH, Chong SC, Low PS	Adequacy of hyperventilation during pediatric EEG recording as measured using non-invasive end-tidal carbon dioxide monitoring.	<i>Epilepsia.</i> 2005;46(suppl s8):139 (Abst.2.144).	
Silvestri S, Ralls GA, Krauss B, Thundiyil J, Rothrock SG, Senn A, Carter E, Falk J	The effectiveness of out-of-hospital use of continuous end-tidal carbon dioxide monitoring on the rate of unrecognized misplaced intubation within a regional emergency medical services system.	<i>Ann Emerg Med.</i> 2005;45(5):497-503.	http://www.ncbi.nlm.nih.gov/pubmed/15855946

2004

Authors	Titles	Citation	URL
Aronson AA, Thomas SH, Harrison T, Saia M, Bach H	Use of end-tidal carbon dioxide monitoring to detect occult hypoventilation in patients receiving opioids in the pre-hospital and emergency department settings.	<i>Chest</i> . 2004;126(4_MeetingAbstracts):907S.	
Babre F, Bordes M, Semjen F, Cros AM	Usefulness of oral and nasal capnography in the pediatric recovery room.	<i>Anesthesiology</i> . 2004;101:A1503.	
Bonnin M, Chow-Chine L, Mission JP, Bolandard F, Storme B, Rol B, Barriere A, Bazin JE	Respiratory adverse effects after intrathecal versus epidural morphine for postoperative analgesia in caesarean section measuring endtidal carbon dioxide: A-638.	<i>Eur J Anaesthesiol</i> . 2004;21(suppl 32):156.	
Brock-Utne JG, Chow JL, Williams DM, Lemens HJ, Feasters W	Incidence of airway compromise in morbidly obese patients recovering from general anesthesia after laparoscopic gastric bypass surgery: A-274.	<i>Eur J Anaesthesiol</i> . 2004;21(suppl 32):68.	
Calzia E, Muth C, Stahl W, Trencz C, Radermacher P	Continuous end-expiratory PCO ₂ monitoring after major surgery using the Microcap® plus device.	<i>Intensive Care Med</i> . 2004;30(suppl 1):S173.	
Chow JL, Hanowell JH, Williams DM, Lemmens HJ, Chun S, Brock-Utne JG	Incidence of airway compromise in cardiac patients undergoing conscious sedation for implantable cardioverter defibrillator placement: A-264.	<i>Eur J Anaesthesiol</i> . 2004;21(suppl 32):65-66.	
Gehring H, Stein N, Matz H, Konecny E	Assessment of gas exchange in spontaneously breathing patients.	<i>Anesthesiology</i> . 2004;101:A1559.	
Kober A, Schubert B, Bertalanffy P, Gorove L, Puskas T, Gustorff B, Joldzo A, Hoerauf K	Capnography in non-tracheally intubated emergency patients as an additional tool in pulse oximetry for prehospital monitoring of respiration.	<i>Anesth Analg</i> . 2004;98(1):206-210, table of contents.	http://www.ncbi.nlm.nih.gov/pubmed/14693620
Perl A	The advantages of end-tidal CO ₂ monitoring for improved patient care during total intravenous anesthesia: A-73.	<i>Eur J Anaesthesiol</i> . 2004;21(suppl 32):19.	
Plantevin F, Stephanazzi J, Billard V, Bourgain JL	Detection of post-operative obstructive apnoea (OA) among patient with desaturation risk: A-301.	<i>Eur J Anaesthesiol</i> . 2004; 21 (suppl 32): 76.	
Plantevin F, Stephanazzi J, Billard V, Bourgain JL	Detection of post-operative apnea among patients with desaturation risk.	<i>Anesthesiology</i> . 2004;101:A571.	
Playford HR, Lu JC, Park HH, Sladen RN	End-tidal CO ₂ measurements by a novel sidestream capnometer before and after extubation following cardiac surgery.	<i>Anesthesiology</i> . 2004;101:A572.	
Soto RG, Fu ES, Vila H Jr, Miguel RV	Capnography accurately detects apnea during monitored anesthesia care.	<i>Anesth Analg</i> . 2004;99(2):379-382, table of contents.	http://www.ncbi.nlm.nih.gov/pubmed/15271710

2003

Authors	Titles	Citation	URL
Barbi E, Gerarduzzi T, Marchetti F, Neri E, Verucci E, Bruno I, Martellosi S, Zanazzo G, Sarti A, Ventura A	Deep sedation with propofol by nonanesthesiologists: a prospective pediatric experience.	<i>Arch Pediatr Adolesc Med</i> . 2003;157(11):1097-1103.	http://www.ncbi.nlm.nih.gov/pubmed/14609901
Biedler AE, Wilhelm W, Kreuer S, Soltesz S, Bach F, Mertzlufft FO, Molter GP	Accuracy of portable quantitative capnometers and capnographs under prehospital conditions.	<i>Am J Emerg Med</i> . 2003;21(7):520-524.	http://www.ncbi.nlm.nih.gov/pubmed/14655228
Kalyn A, Blatz S, Feuerstake S, Paes B, Bautista C	Closed suctioning of intubated neonates maintains better physiologic stability: a randomized trial.	<i>J Perinatol</i> . 2003;23(3):218-222.	http://www.ncbi.nlm.nih.gov/pubmed/12732859
Saito S, Kadoi Y, Nishihara F, Aso C, Goto F	End-tidal carbon dioxide monitoring stabilized hemodynamic changes during ECT.	<i>J ECT</i> . 2003;19(1):26-30.	http://www.ncbi.nlm.nih.gov/pubmed/12621274
Singh S, Allen WD, Westerman ME, Venkataraman ST, Bhende MS	Utility of a handheld Microstream capnometer during transport of critically ill neonates.	PAS2003: 729	
Soto RG, Fu ES, Vila Jr H, Miguel RV	Does nasal capnography improve patient safety during MAC?	<i>Anesth Analg</i> . 2003; 96(suppl 2S):S-147.	
Takano Y, Sakamoto O, Kiyofuji C, Ito K	A comparison of the end-tidal CO ₂ measured by portable capnometer and the arterial PCO ₂ in spontaneously breathing patients.	<i>Respir Med</i> . 2003;97(5):476-481.	http://www.ncbi.nlm.nih.gov/pubmed/12735663

2002

Authors	Titles	Citation	URL
Fearon DM, Steele DW	End-tidal carbon dioxide predicts the presence and severity of acidosis in children with diabetes.	<i>Acad Emerg Med.</i> 2002;9(12):1373-1378.	http://www.ncbi.nlm.nih.gov/pubmed/12460840
Hagerty JJ, Kleinman ME, Zurakowski D, Lyons AC, Krauss B	Accuracy of a new low-flow sidestream capnography technology in newborns: a pilot study.	<i>J Perinatol.</i> 2002;22(3):219-225.	http://www.ncbi.nlm.nih.gov/pubmed/11948385
Steele DW, Fearon DM	How well does the clinical impression of hyperpnea predict hypocapnea in children presenting to the emergency department with suspected diabetic ketoacidosis?	PAS 2002: 569	

2001

Authors	Titles	Citation	URL
Brodsky JB, Lemmens HJM, Muthukumarasamy R, Brock-Utne JG	Evaluating ventilation during monitored anesthesia care: a comparison of two capnography systems.	<i>Anesthesiology.</i> 2001;95:A54.	
Casati A, Gallioli G, Passaretta R, Scandroglio M, Bignami E, Torri G	End tidal carbon dioxide monitoring in spontaneously breathing, nonintubated patients. A clinical comparison between conventional sidestream and microstream capnometers.	<i>Minerva Anesthesiol.</i> 2001;67(4):161-164.	http://www.ncbi.nlm.nih.gov/pubmed/11376503
Fearon DM, Steele DW	End-tidal CO ₂ predicts the presence and severity of diabetic ketoacidosis.	PAS2001: 590	
Singh S, Allen WD, Jr., Venkataraman ST, Bhende MS	Utility of a novel handheld Microstream capnometer during transport of critically ill children.	PAS2001: 450	

2000

Authors	Titles	Citation	URL
Casati A, Gallioli G, Scandroglio M, Passaretta R, Borghi B, Torri G	Accuracy of end-tidal carbon dioxide monitoring using the NBP-75 microstream capnometer. A study in intubated ventilated and spontaneously breathing nonintubated patients.	<i>Eur J Anaesthesiol.</i> 2000;17(10):622-626.	http://www.ncbi.nlm.nih.gov/pubmed/11050520
Hagerty JJ, Kleinman ME, Lyons AC, Krauss B	Accuracy of a new low-flow sidestream capnography technology in newborns.	PAS2000. 2000:2125.	
Hagerty JJ, Krauss B, Insoft RM	Characterization of capnograms in healthy newborns.	PAS2000: 2126	
Vardi A, Levin I, Paret G, Barzilay Z	The sixth vital sign: end-tidal CO ₂ in pediatric trauma patients during transport [in Hebrew].	<i>Harefuah.</i> 2000;139(3-4):85-87, 168.	http://www.ncbi.nlm.nih.gov/pubmed/10979461



COVIDIEN, COVIDIEN with logo and Covidien logo are U.S. and internationally registered trademarks of Covidien AG.
Other brands are trademarks of a Covidien company. © 2015 Covidien.

CDN-R00233-E (13 PME 0019 etCO2 GB) Rev. 2015/02

8455 TRANS-CANADA HIGHWAY
SAINT-LAURENT, QUEBEC
H4S 1Z1

877-664-8926 [T]
800-567-1939 [F]

WWW.COVIDIEN.COM