ventilation is applied if tracheal intubation may be disadvantageous for the patient. However, fitting a facial or nasal mask may be difficult in patients with a beard or large nose, or in the presence of severe agitation. Insertion of the LMA does not require laryngoscopy, and as the present case report points out, additional sedation may not be required for airway tolerance.

Thomas W. Felbinger MD*†
S. Rao Mallampati MD*
Holger K. Eltzschig MD*‡
Brigham and Women’s Hospital, Boston, USA*
Grosshadern Medical Center, Munich, Germany†
Tübingen University Hospital, Tübingen, Germany‡
E-mail: heltzschig@partners.org

References
1 Casati A, Fanelli G, Torri G. Physiological dead space/tidal volume ratio during face mask, laryngeal mask, and cuffed oropharyngeal airway spontaneous ventilation. J Clin Anesth 1998; 10: 652–5.
2 Keller C, Sparr HJ, Luger TJ, Brimacombe J. Patient outcomes with positive pressure versus spontaneous ventilation in non-paralysed adults with the laryngeal mask. Can J Anaesth 1998; 45: 564–7.
3 Groudine SB, Lamb PD, Sandison MR. Pressure support ventilation with the laryngeal mask airway: a method to manage severe reactive airway disease postoperatively. Can J Anaesth 1995; 42: 341–3.
4 Tobias JD. Noninvasive ventilation using bilevel positive airway pressure to treat impending respiratory failure in the postanesthesia care unit J Clin Anesth 2000; 12: 409–12.

Using a CO₂ detector to confirm endotracheal intubation in SARS patients

To the Editor:
Severe acute respiratory syndrome (SARS) is a new respiratory viral epidemic with devastating impact on economics and the practice of medicine. SARS struck Taiwan in the Spring of 2003, causing many deaths, serious morbidity and closure of provincial hospitals. The high infectious rate by droplet transmission places anesthesiologists at a substantial risk during tracheal intubation. Two physicians were infected during intubation resulting in mortality at the early stage of SARS in Taiwan. In addition to wearing personal protective equipment (PPE), using powered air purifying respirators (PAPR) during tracheal intubation can completely eliminate SARS-CoV contamination. PPE consisted of double gowns, double gloves, Tyvek hood (Texas America Safety Company, Brownwood, TX, USA), N95/100 mask (3M, Taipei, Taiwan), goggles and face shield.

However, wearing PPE with PAPR renders the user with impaired hearing, vision and communication. Verifying correct tracheal intubation by using a stethoscope for auscultation became difficult. There were 31 SARS patients who required tracheal intubation for mechanical ventilation at the Taipei-Veterans General Hospital. A total numbers of 37 intubations were performed because four patients had double intubations and one patient had triple intubations. In order to prevent cough with high viral content during intubation, after preoxygenation the tracheal intubation was facilitated by intravenous administration with propofol and succinylcholine. We then connected the disposable colorimetric end-tidal CO₂ detector (the Nellcor® Easy Cap™ II) to the endotracheal tube to verify the correct endotracheal tube placement.

The CO₂ detector device (the Fenem FEF™ CO₂ detector) was first introduced for confirmation of tracheal intubation in 1988. It is a small, portable plastic attachment connected between the tube and catheter mount of the breathing system. It is also a semi-quantitative capnometer devoid of electronics. The EasyCap™ II detector detects carbon dioxide in exhaled gases via a chemical coloured membrane and changes colour from purple to yellow. Such a change indicates the presence of CO₂ in the exhaled gas which passes. In our experience, the colour of the colorimetric end-tidal CO₂ detector changed from purple to yellow within six cycles of breathing ventilated by ambu-bagging after endotracheal intubation in SARS patients.

None of the anesthesiologists who performed the intubation procedure under the guideline was infected. The use of the disposable colorimetric end-tidal CO₂ detector could be a simple and reliable way of confirming correct tracheal intubation in SARS patients while wearing PPE with PAPR.

Chien-Kun Ting MD*
Hsu-Tang Liu MD*
Kung-Yen Chen MD*
Chen-Kou Liu MD*
Mei-Yung Tsou MD PhD*†
Kwok-Hon Chan MD*†
Shen-Kou Tsai MD PhD*†
Taipei Veterans General Hospital, Taipei,* Taiwan National Yang-Ming University, Taipei,† Taiwan
E-mail: sktsai@vghnpe.gov.tw
Ventricular fibrillation in the postanaesthesia care unit (PACU) secondary to coronary spasm

To the Editor:
A 61-yr-old male patient was scheduled for open retropubic prostatectomy. Medical history consisted of arterial hypertension and ischemic cardiopathy treated medically (nitrates and diltiazem chloride). Preoperatively, the patient did not complain of chest pain and functional capacity was good. Physical examination, resting electrocardiography and usual preoperative blood tests were normal. The patient did not take his morning diltiazem, arriving to the operating room 36 hr after his last dose. Induction of anesthesia was achieved by iv propofol, sufentanil, and rocuronium. Maintenance of anesthesia was with inhaled sevoflurane (1–2% end-tidal) and iv boluses of sufentanil and rocuronium as needed. Surgery was uneventful. On PACU arrival, the patient was fully awake, responsive and free of pain. Systemic blood pressure was 118/66 mmHg, heart rate 62 beats·min–1, and pulse oximetry 99%. A few minutes later, the patient developed ventricular fibrillation (VF). He was resuscitated as per the Adult Advanced Cardiac Life Support algorithm. During the next hour, episodes of VF occurred inducing hemodynamic instability. The 12-lead electrocardiogram recorded during normal sinus rhythm showed diffuse and massive ST-segment elevation. Cardiac catheterization was decided. During the transfer, he developed electromechanical dissociation and despite adequate resuscitation, the patient remained 30 min without a detectable pulse. After a last 1 mg administration of epinephrine, the heart rate normalized. The coronary angiogram showed a severe, diffuse coronary spasm, leading to the diagnosis of variant angina. Intracoronary nitroglycerin immediately relieved the spasm, uncovering a normal coronary anatomy. The patient made a rapid recovery.

This case is illustrative of possible causes of VF in the PACU: coronary spasm due to undiagnosed variant angina or acute withdrawal of calcium-channel blockers.

This makes the preoperative interview and maintenance of usual medications crucial. A clear diagnosis is sometimes difficult during resuscitation. Epinephrine can induce a vicious circle making further therapeutic decisions difficult, while nitrates or calcium-channel blockers are not always easy, straightforward, therapeutic choices during persistent VF.

The diagnosis of variant angina is not always easy to make preoperatively. This condition is probably under diagnosed in the surgical population. A patient with an unclear coronary history developing VF in the perioperative period must undergo rapid coronary angiography to make the difference between "classic" atheromatous coronary disease and variant angina. Moreover it allows specific treatment: coronary angioplasty with or without stenting or intracoronary nitrate injection.

Jean-Corentin Salengros MD
Pierre Pandin MD
Edgard Engelman MD
CUB Hôpital Erasme, Brussels, Belgium
E-mail: Jean-Salengros@ulb.ac.be

References
1 Guidelines 2000 for Cardiopulmonary Resuscitation and Emergency Cardiovascular care: Part 6: advanced cardiovascular life support: 7C: a guide to the International ACLS algorithms. The American Heart Association in collaboration with the International Liaison Committee on Resuscitation. Circulation 2000; 102(suppl I): I142–57.
2 Karch SB. Coronary artery spasm induced by intravenous epinephrine overdose. Am J Emerg Med 1989; 7: 485–8.
3 Rovai D, Bianchi M, Baratto M, et al. Organic coronary stenosis in Prinzmetal’s variant angina. J Cardiol 1997; 306: 299–305.
4 Adachi N, Miyamoto Y, Hodono S, Yorozuya T, Arai T. Management of unexpected coronary artery spasm in an asymptomatic patient during anaesthesia. Acta Anaesthesiol Scand 2003; 47: 1172–3.