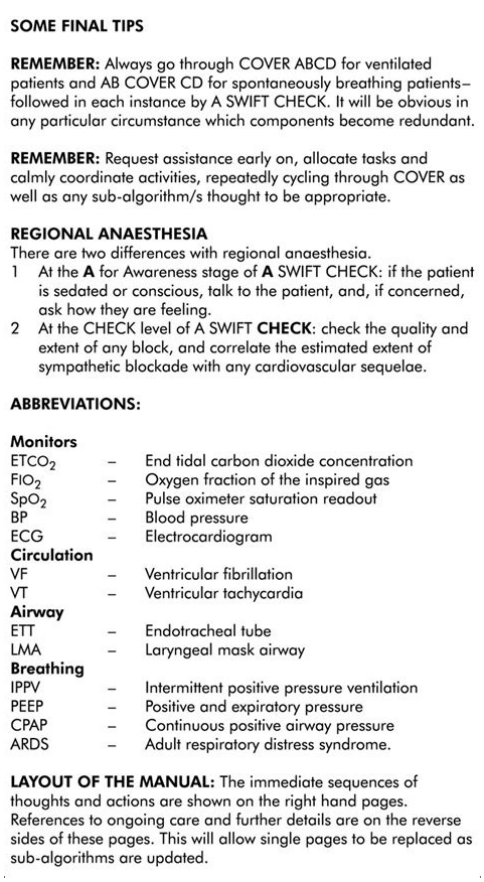
# Crisis management manual cover abcd a swift check



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**REGIONAL ANAESTHESIA**

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2 At the CHECK level of A SWIFT **CHECK**: check the quality and extent of any block, and correlate the estimated extent of sympathetic blockade with any cardiovascular sequelae.

**ABBREVIATIONS:**

**Monitors**

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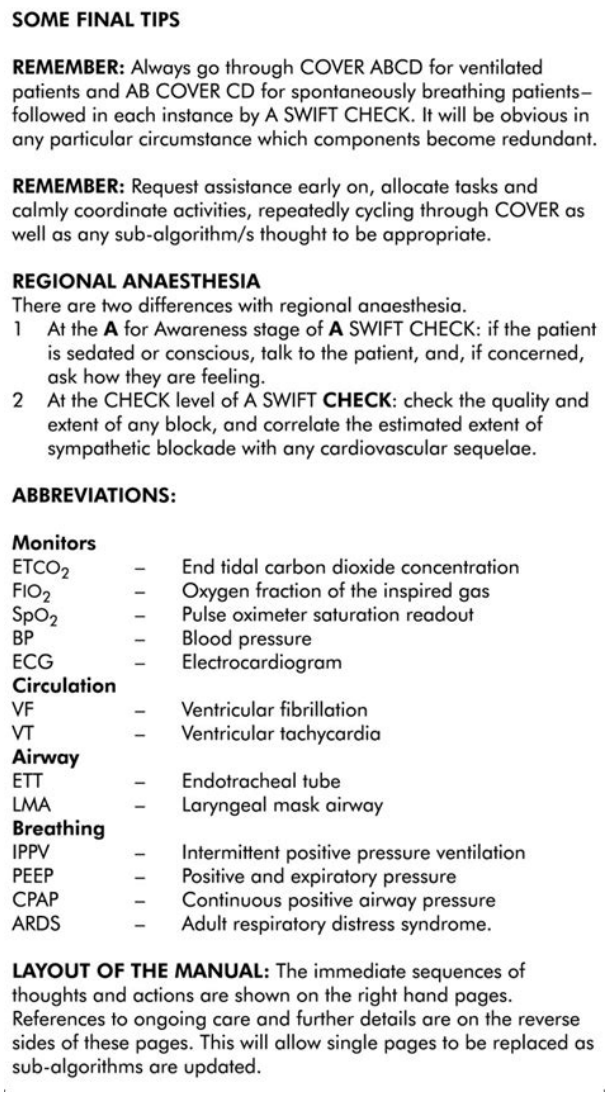

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Please enable it to take advantage of the complete set of features!Get the latest public health information from CDC. Get the latest research from NIH. Find NCBI SARSCoV2 literature, sequence, and clinical content.However, some cognitive strategies and work practices that are appropriate for speed and efficiency under normal circumstances may become maladaptive in a crisis. It was recommended that specific subalgorithms be developed for managing the problems underlying the remaining 40% of crises and assembled in an easytouse manual. Subalgorithms were therefore developed for these problems so that they could be checked for applicability and validity against the first 4000 anaesthesia incidents reported to the Australian Incident Monitoring Study AIMS.Teams of practising anaesthetists were assembled and sets of incidents relevant to each subalgorithm were identified from the first 4000 reported to AIMS. Based largely on successful strategies identified in these reports, a set of 24 specific subalgorithms was developed for trial against the 4000 AIMS reports and assembled into an easytouse manual. The manual was disseminated at a World Congress and feedback was obtained.The descriptions of the validation of each of the 24 subalgorithms constitute the remaining 24 papers in this set. Feedback from five meetings each attended by 60100 anaesthetists was then collated and is included.The COVER component has been found to be satisfactory in real life resuscitation situations and the subalgorithms have been used successfully

for several years. It would now be desirable for carefully designed simulator based studies, using naive trainees at the start of their training, to systematically examine the merits and demerits of various aspects of the subalgorithms. It would seem prudent that these subalgorithms be regarded, for the moment, as decision aids to support and back up clinicians natural responses to a crisis when all is not progressing as expected.http://crowngreenenergy.com/upload/fowlers-vacola-ultimate-dehydrator-4000-manual.xml

- **crisis management manual cover abcd a swift check, crisis management manual cover abcd a swift check, crisis management manual cover abcd a swift checker, crisis management manual cover abcd a swift check valve, crisis management manual cover abcd a swift checklist, crisis management manual cover abcd a swift checking.**

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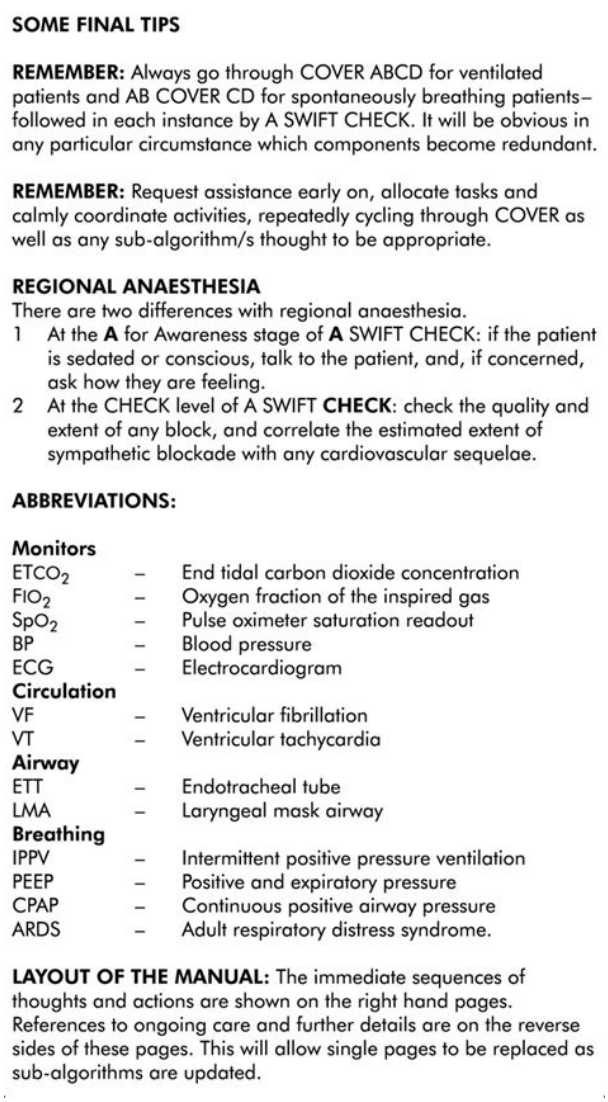
The potential performance of this structured approach for each of the relevant incidents among the first 4000 reported to the Australian Incident Monitoring Study AIMS was compared with the actual management as reported by the anaesthetists involved. Amongst the first 4000 incidents reported to AIMS there were 584 episodes of desaturation in association with general anaesthesia; 41% were dealt with by COVER, 48% by ABCD, and 11% required a specific desaturation subalgorithm. Nearly a fifth of all desaturations were caused by endobronchial intubation. Within the specific desaturation subgroup, half were due to pulmonary problems in the form of underlying lung disease, excessive secretions or obesity and a third could not be diagnosed. Desaturation may have many causes, some

of which are obscure, and failure to respond promptly may place the patient at risk. In the face of persistent desaturation, management should consist of hand ventilation with 100% oxygen, completion of COVER ABCDA SWIFT CHECK, and a return to a supine posture. Download fulltext PDF See end of article for authors' affiliations. The rapidity with which the cause is determined and appropriate management is instituted varies considerably between anaesthetists. Methods The potential performance of this structured approach for each of the relevant incidents among the first 4000 reported to the Australian Incident Monitoring Study AIMS was compared with the actual management as reported by the anaesthetists involved. Results Amongst the first 4000 incidents reported to AIMS there were 584 episodes of desaturation in association with general anaesthesia; 41% were dealt with by COVER, 48% by ABCD, and 11% required a specific desaturation subalgorithm. Nearly a fifth of all desaturations were caused by endobronchial intubation.[http://gemicilojistik.com/userfiles/upload/fowler-trimos-manual.xml](http://gemicilojistik.com/userfiles/upload/fowler-trimos-manual.xml)



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Within the specific desaturation subgroup, half were due to pulmonary problems in the form of underlying lung disease, excessive secretions or obesity and a third could not be diagnosed. Conclusion Desaturation may have many causes, some of which are obscure, and failure to respond promptly may place the patient at risk. T he introduction of pulse oximetry into general use in the perioperative setting revealed the occurrence of desatura tion, in varying degrees, more commonly than was expected. Desaturation may be present preoperatively due to preexisting illness, airway compromise, or the effects of premedication drugs. It may occur in relation to anaesthesia from a

myriad of causes—some rare and obscure, but nearly all potentially life threatening 1 —and has been shown to be a significant problem in the postoperative period for several days. The degree and duration of desaturation that mandates treatment has not been clearly defined and is, to some extent, dependent on the context in which it occurs. Is a long period of mild desaturation more acceptable than a short period of severe desaturation. Within the context of anaesthesia, the oximeter is used to provide both an absolute measure and a trend, and provides rapid warning of a decline in oxygenation. In clinical situations such as laryngospasm or difficult intubation, oximetry provides an invaluable measure of the adequacy of ventilation. In other situations such as endobronchial intubation or intrapulmonary shunt, the oximeter provides the first warning of a problem. The occurrence of desatura tion needs to be interpreted in the light of the prevailing clinical situation and a cause rapidly found. METHODS Of the first 4000 incidents reported to AIMS, those that made reference to desaturation were extracted and analysed for relevance, presenting features, type of surgery, cause, management and outcome.

As desaturation is not adequately dealt with by this algorithm, a specific sub algorithm for desaturation was developed and its putative effectiveness was tested against the reports.Of these, 86 were excluded because they occurred before induction, in the recovery ward, or under regional anaesthesia. A further 36 did not involve desaturation but mentioned it specifically to exclude it in situations where it would have been expected. Examples are rapidly detected circuit disconnections or successful bag and mask ventilation during a difficult intubation. This left 584 incidents for analysis. The COVER algorith m The COVER algorithm adequately diagnosed 237 of the 584 incidents 41%. The distribution of these figures is shown in fig 1. Two incidents were diagnosed by cardiac arrest C1 and 10 were diagnosed at O five involved the delivery of hypoxic gas mixtures, four involved preoxygenation or mask ventilation with no gas flow, and one was a common gas outlet disconnection. Over 90% of the COVER incidents were diagnosed at V1 or E1. Most of the V1 incidents involved leaks and disconnects. Common gas outlet disconnects accounted for many of these due to a failure to reconnect the hoses after a change of circuit. This also implies a failure to check the circuit before use as well as a failure to watch respiratory movements in the rebreathing bag during preoxygenation. Either of these manoeuvres would have immediately drawn attention to the disconnection. There were 138 incidents diagnosed at E1 checking the endotracheal tube, of which 103 were due to endobronchial intubation. In spite of increased awareness of the problem, endobronchial intubation remains a major cause of desatura tion during general anaesthesia. The diagnosis was made very late in some of these incidents, with consequent morbidity for the patient.

One patient was reported to have suffered a perioperative infarct, possibly as a result of prolonged desaturation, and at least one had postoperative radiographic evidence of lobar collapse. A further three patients had their endobronchial intubation diagnosed by a postoperative CT scan or chest radiograph in the ICU. In none of these incidents did the narrative record any attempt to specifically exclude endobronchial intubation. It is therefore tempting to conclude that, with earlier recognition—for example, by use of the COVER algorithm—much of this morbidity could have been avoided. Given that endobronchial intubation accounts for nearly one fifth of all reported desaturation incidents, it should be actively sought and excluded early in the evolution of the desaturation. Eight incidents were resolved when monitors and equip ment were reviewed and found to be at fault R. ABCD algorithm A further 281 incidents were dealt with by the ABCD algorithm. Figure 2 shows the distribution of causes among these categories. Most of these situations presented no diagnostic challenge but required a subalgorithm for further manage ment. Hypoventilation was responsible for most of these. Many were due to coughing, straining or breathholding, some with mask ventilation, some with laryngeal masks, some after intuba tion, and some after extubation. Half of these arose in intubated patients, with the degree of straining sufficient to prevent adequate ventilation. Some of these patients desatur ated profoundly 50% and needed to be reanaesthetised to regain control of the situation. These incidents are dealt with by specific subalgorithms that are covered in other papers in this series. Desaturat ion algorithm There remained 66 incidents 11% in which neither COVER nor ABCD had adequately managed the problem.

Table 1 Causes of desaturation in which neither COVER nor ABCD adequately dealt with the problem Causes No Excessive secretions 11 Underlying lung disease 11 Obesity syndrome 10 Monitor error 5 Cardiovascular 4 Suspected emb olism 4 Could not determine 21 Total 66 2o f6 Szekely, Runciman, Webb, et al www.qshc.com By definition, this was a more challenging group of incidents. Bronchial plugs or excessive secretions can produce a shunt effect which may be unmasked by the abolition of the homeostatic mechanism of hypoxic pulmonary vasoconstric tion with the induction of anaesthesia, resulting in marked desaturation. Also included in this category was the case of a child undergoing nephrectomy for a perinephric abscess in whom the sudden deterioration was later explained by the finding that the abscess had extended into the lung and ruptured during surgery, soiling the bronchial tree with copious amounts of purulent fluid. For example, a baby with known bronchopulmonary dysplasia and subglottic stenosis was turned on his side for insertion of a spinal with no monitoring in place. When the spinal block was completed and the child turned supine again, he was found to be profoundly cyanosed Sp O 2 50%. It is exacerbated by spontaneous ventilation and by the lithotomy position. All of the patients in this category were obese and all but two were in the lithotomy position. In one the oximeter showed marked desatura tion, both with a finger probe and an ear probe, but a simultaneous blood gas analysis showed a P O 2 of 458. A falsely low reading occurred in a patient with polycythaemia and one in a patient who was very cold. The remaining false readings occurred in a patient with tricuspid incompetence in whom the oximeter was sensing a venous pulse, and in a patient with an old arteriovenous fistula. Further details may be found in 6 below.

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3 2% of incidents were due to bronchial plugs or excessive bronchial secretions, which can produce marked desaturation, especially in young children. A shunt effect is produced, which may be unmasked by abolition of hypoxic pulmonary vasoconstriction with induction of anaesthesia. 4 “Obesity syndrome” refers to the rapid desaturation which may be seen at induction when anaesthetising obese patients, or those with tightly distended abdomens, and accounted for 2% of relevant incidents. The lithotomy and T rendelenberg positions, spontaneous ventilation and hypovolaemia all may exacerbate the problem, resulting in sudden desaturation at the start of a case and progressive desaturation during the maintenance phase. 5 0.8% of incidents involved suspected gas embolism. 6 1% of incidents involved unusual causes of pulse oximeter malfunction, including acute tricuspid incompetence, polycythaemia and methaemoglobinaemia. Acute tricuspid incompetence may lead to the oximeter sensing the venous pulse. A large plethysmo graphic wave form and a saturation of 7075% is commonly seen. Arterial saturation, when directly measured, may be quite adequate. P olycythaemia may lead to arte factually low saturation readouts with high directly measured arterial oxygen saturations or tensions. Methaemoglobinaemia, depending on its extent, will cause the saturation to approach 85%. Figure 3 Desaturation. Desaturation crisis management 3o f6 www.qshc.com In each case a fall in saturation was associated with hypotension and a moderate to severe fall in endtidal carbon dioxide. One of the cases occurred during hydrogen peroxide irrigation of a freshly curetted frontal lobe abscess cavity, one occurred during a laparoscopic cholecystectomy, and one during a nephro ureterectomy. In some the information provided by the reporter was inadequate while, in others, no conclusions were possible despite detailed reporting of the incident.

Within the subgroup of 66 incidents that required the specific desaturation subalgorithm, it was felt that 15% of these would have been better handled by correct application of the algorithm. In most incidents this referred to failure to clearly work through a logical sequence, ventilate by hand on 100% oxygen, suction the airway, or check blood gases. There was a haphazard approach to finding a cause, an acceptance that desaturation had occurred and the fraction of inspired oxygen increased with no further attempt to elucidate a cause. In 14% it was not possible to determine what the cause of the desaturation was because of inadequate information in the reports. Overall, the majority of incidents in this subgroup were handled well even if the underlying cause could not be found. There were no incidents where use of the desaturation subalgorithm was thought to have been likely to make the situation worse. DISCUSSION Desaturation is a common occurrence during general anaesthesia. It occurs for many reasons related to anaesthetic equipment and to the patient.For the purposes of this paper, only those incidents that occurred in the context of a general anaesthetic were considered. Incidents which occurred in patients undergoing regional or local anaesthesia, or which occurred before induction or after emergence, were excluded. Thus, there were 584 incidents for analysis. Most desaturations 52% occurred during the mainte nance phase as shown in table 2. Those which occurred at induction were largely those where the cause was immedi ately obvious for example, laryngospasm, difficult intuba tion, inadequate ventilation. However, these observations emphasise the importance of preoxygenation. 91 0 Similarly, the greater proportion of the emergence desaturation incidents were due to obvious causes such as aspiration, laryngospasm, coughing, and breath holding. Again, 100% oxygen at emergence clearly represents good practice.



The much bigger group of incidents occurring during the maintenance phase were from more obscure causes. More than half of these were diagnosed by the COVER algorithm and include a large contribution from endobronchial intuba tion. Numerous equipment related problems accounted for the rest. Within the specific desaturation subgroup the small group of difficult incidents not handled by COVER or ABCD, two thirds occurred during maintenance. These incidents were frequently difficult for the anaesthetist to unravel. In those patients with known lung disease, desaturation may occur for any number of reasons totally unrelated to their disease; the normal COVER algorithm should therefore be worked through to exclude other causes. The widespread availability of pulse oximetry highlights the fact that anaesthetists may not observe cyanosis until there is marked desaturation. Thus, the Australian and New Zealand College of Anaesthetists requires that a pulse oximeter be available for the exclusive use of every anaesthetised patient. 11 The importance of oximetry is high lighted by the fact that, in half the reported incidents, desaturation was the first warning that all was not well. Table 3 shows the pattern of desaturation as a first or second warning 80% of the COVER related incidents were heralded by desaturation table 3, fig 1, as were 80% of the specific desaturation subalgorithm incidents. Even in the anaphy laxis and embolism incidents included in this paper, desaturation was often the first warning, rather than bronchospasm or hypocarbia, as would be expected. The incidents where desaturation was the second presentation were largely those where it was obvious that a problem had occurred, such as laryngospasm, aspiration, or difficult intubation. There remained a third of the desaturation subalgorithm group in which the underlying cause was not found.



Some of these were due to inadequate information on the forms, but many were because the reporting anaesthetist was faced with a complex clinical situation in which a number of potential factors were involved. In most of these the management of the incident was good, in that all attempts were made to maintain oxygenation while finding a cause. The resulting structured approach to managing clinical desaturation, as appears in the Crisis Management Manual, 12 is

detailed in fig 3. Finally, it is important that a full explanation of what happened be given to the patient and the problem clearly documented in the anaesthetic record. If a particular precipitating event was significant or a particular action was useful in resolving the crisis, this should be clearly explained and documented. ACKNOWLEDGEMENTS The authors would like to thank all the anaesthetists in Australia and New Zealand who contributed to the 4000 incident reports upon which this and the other 24 papers in the Crisis Management Series are based. The coordinators of the project also thank Liz Brown for preparing the draft of the original Crisis Management Manual; Loretta Smyth for typing; Monika Bullock RN for earlier coding and classifying of data; Dr Charles Bradfield for the electronic version of the algorithms; Dr Klee Benveniste for literature research; and Drs Klee Benveniste, Michal Kluger, John Williamson and Andrew Paix for editing and checking manuscripts. Authors' affiliations.

S M Szekely, Senior Staff Specialist, Department of Anaesthesia and Intensive Care, Royal Adelaide Hospital and University of Adelaide, Adelaide, South Australia W B Runciman, Professor and Head, Department of Anaesthesia and Intensive Care, University of Adelaide and Royal Adelaide Hospital, Adelaide, South Australia R K Webb, Senior Staff Specialist, Department of Anaesthesia and Intensive Care, The Townsville Hospital, Douglas, Queensland, Australia Key messages N There were 584 analysable episodes of desaturation 15% among the first 4000 incidents reported to AIMS. N Another 86 occurred before induction, in recovery, or under regional anaesthesia; these are excluded from this series. N With half of the incidents analysed, desaturation was the first warning, emphasising the importance of pulse oximetry. N Almost a fifth of all the desaturation incidents were caused by endobronchial intubation. This cause was often associated with late diagnoses and consequent patient morbidity. N Profound desaturation occurred in some intubated patients in association with coughing, straining, or breath holding. N Sixty six incidents 11% were not managed adequately by the core algorithm COVER ABCD. The most common causes in this group were excessive secretions e.g. in heavy smokers, underlying lung disease, and obesity syndrome. N 15% of the 66 incidents would have been better handled by correct application of the specific sub algorithm for desaturation. N Most desaturation incidents 52% occurred during the maintenance phase. N In all desaturation situations, ventilation with 100% oxygen represents good practice. Always attempt to maintain oxygenation while a cause for the desatura tion is being sought. Desaturation crisis management 5o f6 www.qshc.com REFERENCES 1 Webb RK, van der Walt JH, Runcim an WB, et al. Wh ich monitor An analysis of 2000 incident reports. Crisis manageme nt validation of an algorithm by analysis of 2000 incident reports.

The Australian Incident Monitoring Study an analysis of 2000 incident reports. Crisis management during anaesthesia the development of an anaesthetic crisis management manual. Qual Saf Health Care 2005; 14e1. 5 Visvanathan T, Kluger MT, Web b RK, et al. Crisis management during anaesthesia laryngospasm. Qual Saf Health Care 2005; 14e3. 6 Paix AD, Williamson JA, Runciman WB. Crisis management during anaesthesia difficult intubation. Qual Saf Health Care 2005; 14e5. 7 Kluger MT, Visvanathan T, Myburgh JA, et al. Crisis managemen t during anaesthesia regurgitation, vomiting, and aspiration. Qual Saf Health Care 2005; 14e4. 8 Raksakietisak M, Chinachoti T, Vudhikamraksa S, et al. Perio perative desaturation incidence, causes, man agement and outcome. Multicentre study of preoxygenation practices by anaesthesia providers. Preoxygenation comparison of maximal breathi ng and tidal volume breathing techniques. Poli cy Statemen t 18 Recommendations on monitoring during anaesthesia. Melbourne ANZCA, 2000. Crisis Management Manual COVER ABCD A SWIFT CHECK. Adelaide Australian Patient Safety Foundation, 1996, 74 pp. Available at accessed 6 September 2004. 6o f6 Szekely, Runciman, Webb, et al www.qshc.com Although ultrasonography is frequently used in nerve blocks, airway handling, and vascular access, LUS for routine intraoperative monitoring and in crisis management still necessitates recognition. After reviewing the various articles regarding the use of LUS in critical care, we found, that LUS can be used in various intraoperative circumstances similar to Intensive Care Unit with some limitations.

Except for few attempts in the intraoperative detection of pneumothorax, LUS is hardly used but has wider perspective for routine and crisis management in realtime. If anesthesiologists add LUS in their routine monitoring armamentarium, it can assist to move a step ahead in the dynamic management of critically ill and highrisk patients. View Show abstract.

53,54 Although a relatively rare occurrence, endobronchial intubation is responsible for onefifth of episodes of desaturation during general anesthesia. 55 Lung auscultation, the mainstay of endobronchial intubation diagnosis in the operating room, performs rather poorly, 56 especially in the hands of lessexperienced clinicians. 57 Although never compared headtohead, lung ultrasonography is an extremely sensitive and specific tool to detect endobronchial intubation 58 that could prove superior to auscultation.. Lung Ultrasonography for the Assessment of Perioperative Atelectasis A Pilot Feasibility Study Article Sep 2016 ANESTH ANALG Audrey Monastesse Francois Girard Nathalie Massicotte Martin Girard Background. Few diagnostic tools are available to anesthesiologists when confronted with intraoperative hypoxemia. Lung ultrasonography is a safe and accurate bedside imaging modality. The aim of this study was to evaluate the feasibility of lung ultrasonography during the perioperative period and assess its ability to detect intraoperative respiratory complications and oxygenation changes resulting from perioperative atelectasis. Methods. In this prospective observational pilot study, 30 consecutive patients scheduled for laparoscopic surgery were recruited. Mechanical ventilation was standardized. Lung ultrasonography was performed at 5 predefined time points before induction of general anesthesia GA, after induction of GA, after pneumoperitoneum insufflation, on arrival in the recovery room, and before recovery room discharge. For each echographic examination, 12 pulmonary quadrants were imaged. From these, a semiquantitative score, the lung ultrasound LUS score, was calculated to assess lung aeration at each time point. Results. Lung ultrasonography was possible in all patients. This increase was significantly worse in the basal and dependent lung zones.

Lung ultrasonography helped in the detection of 2 capnothoraces, 1 endobronchial intubation, and 1 episode of subclinical pulmonary edema. Conclusions. Lung ultrasonography in the perioperative period is feasible, allows tracking of perioperative atelectasis, and facilitates the diagnosis of respiratory complications. The evolution of aeration loss correlates moderately with changes in oxygenation. View Show abstract. This is consistent with the findings reported by Oofuvong et al. 7,8. Szekely et al. suggested that difficult intubation, laryngospasm, and pulmonary aspiration occurring during intubation were the main causes of oxygen desaturation 9. In this study, the incidence of oxygen desaturation in patients aged less than 10 and over 60 years old were 27.8% and 21.8%, respectively.. Perioperative and Anesthetic Adverse Events in Thailand PAAd THAI Incident Reporting Study Perioperative Oxygen Desaturation Article Fulltext available May 2018 Pathomporn Pinon Krit Panjasawatwong Anantachote Vimuktanandana Dujduen Sriramatr View Improving Emergency Airway Knowledge and SelfEfficacy Levels of Outpatient Gastroenterology Staff via Implementation of Online Education and In Situ Simulation Article May 2019 GASTROENTEROL NURS Cameron C. Covington Virginia C. Muckler Linda Sheldon Brett Morgan Twenty percent of all ambulatory surgery cases utilizing monitored anesthesia care and sedation report at least one perioperative respiratory complication such as bronchospasm, hypoxia, laryngospasm, or aspiration . However, the national Standards of Practice for both surgical technicians and ambulatory care nurses do not mandate emergency airway education beyond cardiopulmonary resuscitation and Basic Life Support training. A local outpatient gastroenterology clinic noticed the gap in education, and the anesthesia team decided to implement an evidencebased dualfactorial quality improvement project utilizing online education and in situ simulation.

First, registered nurses and procedural technologists completed a test to assess their baseline knowledge and airway emergency performance selfefficacy levels. Then an online module was distributed that included information on the 3 most common anesthesia airway emergencies in the

outpatient setting laryngospasm, aspiration, and obstruction with resultant hypoxemia. Next, participants completed an in situ simulation of the 3 airway emergencies using lowfidelity mannequins. A posteducation assessment was distributed after completion of the simulation training and again at 6 weeks and 3 months postimplementation. The data collected showed a statistically significant increase in both knowledge scores and levels of selfefficacy at 6 weeks and 3 months posteducation p View Show abstract MANAGEMENT OF CRISES DURING ANESTHESIA AND SURGERY. PART VIII DESATURATION Article Fulltext available Jun 2015 Salam Najib Asfar Jasim Mohammed Salman View Desaturaton due to Acute Exacerbation of Chronic Obstructive Pulmonary Disease in the Patient Who Underwent the Cephalic Vein Bypass Surgery under Epidural Anesthesia Article Jun 2018 Yoo Mi Han S. H. Kim Jae Hwa Yoo A Yeon Park View Fundamentals of Managing the Operative Catastrophe Chapter Feb 2018 Idalid Franco David Hepner William Berry Alexander Arriaga Operative catastrophes are lowfrequency events that require rapid and coordinated management under stressful conditions. Although these events may be rare at the individual provider level, they can be a common occurrence when viewed in aggregate in large medical centers. As the surgical volume worldwide continues to grow, it is of critical importance in surgical management that we turn our attention to mechanisms of preventing and addressing potentially catastrophic events, such as through the use of structured cognitive aids including crisis checklists and emergency manuals. View Show abstract Crisis Management of Hypoxia in the OR Article Oct 2016 Patricia C.