

Fifty years of ambulatory anaesthesia: Stepping out and stepping forward!

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The year 2024 might be hailed as 50 years of formally organised ambulatory anaesthesia, which incorporates terms in its scope such as anaesthesia for ambulatory surgery, day-case surgery, office-based anaesthesia and non-operating room anaesthesia (NORA). Although practised informally for more than a century in various settings during the early days of anaesthetic practice, a stand-alone out-of-hospital 'Surgicentre' for day-case or short-stay surgery was started in Phoenix, AZ, USA, in the early 1970s.^[1] The number of anaesthetic procedures in ambulatory or similar non-traditional settings and contexts has grown by leaps and bounds over the half-century, especially over the past two to three decades, showing a striking parallel with the number of publications on this theme.^[1-6]

While ambulatory anaesthesia was limited to small-scale surgical and other procedures during the initial years, gradually, due to technical advances in surgery and anaesthesia, newer, shorter-acting, safer anaesthetic and related drugs, cost considerations, patient preference, enhanced recovery after surgery (ERAS) protocols for various specific surgeries, improved patient selection; prehabilitation, not only did the number of ambulatory anaesthesia procedures increase, but, more importantly, the complexity and patient profiles also expanded on the higher-risk side of the spectrum. Currently, ambulatory anaesthesia is progressively utilised for surgical procedures such

as laparoscopic cholecystectomy, joint arthroplasty, minimally invasive hysterectomy and other minimally invasive procedures of intermediate complexity, including various abdominal procedures, radical prostatectomy and even thyroidectomy. The latest to join the bandwagon of ambulatory anaesthesia are outpatient-based robotic surgeries. Thus, more and more patients are stepping out of the boundaries of the hospital to the quick comfort of their homes earlier than it could have been imagined a few decades ago.

However, as we all know only too well, 'early' should not come at the cost of 'safety'. That is where we all need to 'STEP FORWARD!' (S – Safety precautions; T – Team approach; E – Evaluate carefully; P – Prehabilitation; F – Follow-up arrangement; O – Outcome measurement; R – Regional anaesthesia; W – What matters to the patient?; A – Analgesia [multimodal]; R – Readiness to be discharged [home, street, work]; D – Discharge with documentation). While safety blended with efficacy has always been an essential concern for all types of anaesthetic practice, including the early days of ambulatory anaesthesia, a specific safety-related focus of ambulatory anaesthesia has always been on adequate discharge criteria – when is the patient fit to be discharged home and on the street? The question becomes of central relevance to ambulatory anaesthesia because of the very nature of ambulatory anaesthesia. Ambulatory anaesthesia would no longer remain

'ambulatory' if the patient cannot 'ambulate' as soon as possible following the surgical or other procedure. At the same time, no anaesthesiologist can afford to send his/her patient home to cook, drive, operate on machinery, take care of office or children or meet most of the challenges of daily life in a cognitively, sensorial or motorically compromised state.

Recent emphasis on this 'stepping forward' of ambulatory anaesthesia is noted in several areas related to these broad concerns regarding the safety of anaesthesia, but in increasingly diverse and challenging real-life scenarios. A few exemplars, based on an admittedly selective sampling of the relevant literature over the past 2–3 years, are provided to buttress this point.

As a first exemplar, one of the latest areas of debate is: how far can one push ambulatory anaesthesia for patients who have compromised cardiovascular function or specifically those with coronary artery stents undergoing ambulatory surgery? This is the topic for a 'pro–con debate' published recently in *Anesthesia Analgesia*.^[7] An accompanying editorial notes that the rise in popularity of ambulatory anaesthesia in the USA in the 1970s and 1980s witnessed a parallel increase in coronary artery disease and early cardiac interventions.^[8] Thus, despite initial hesitance and excluding such patients from ambulatory anaesthesia, providing ambulatory anaesthesia was becoming increasingly unavoidable in patients with compromised or supported cardiac function undergoing various ambulatory surgeries or procedures requiring an anaesthesiologist's help. Particularly for patients with coronary stents on high-dose dual antiplatelet therapy, ambulatory anaesthesia involves careful balancing between 'the risk of stent thrombosis due to interruption of antiplatelet therapy and the thrombogenic effects of surgery, and the risk of perioperative bleeding complications that may occur if antiplatelet therapy is continued'.^[8] This area is still challenging and controversial and requires 'stepping out' of our usual comfort zone to meet the challenges.

Another exemplar is providing ambulatory anaesthesia for increasingly complex ambulatory surgeries, which was beyond the scope of ambulatory anaesthesia till perhaps a decade ago. However, more and more such surgical procedures are being performed, such as ambulatory surgery, as mentioned above. An example is the increasing number of total joint replacement surgeries.^[9] These changes

are often precipitated or driven by economic or policy considerations; for example, the United States Center for Medicare and Medicaid Services recently removed total hip and knee arthroplasty from its 'inpatient-only' list, allowing for outpatient reimbursement. Indeed, it is projected that outpatient total joint arthroplasty (TJA) may constitute over half of all TJA procedures by 2026. It is not surprising that challenges for ambulatory anaesthesia would arise, not the least because of the patient profile-related factors that enhance risk (increased age, multiple physical comorbidities, medications), but also surgical factors. It has been observed that the most common reasons for failure to achieve same-day discharge include hypotension, nausea and vomiting, and uncontrolled pain – all in the direct domain of the anaesthesiologist. This is yet another area of 'stepping out' of our comfort zone.

The same can be said for the ever-increasing scope of outpatient robotic surgery. For the anaesthesiologist, robotic surgery comes with the following challenges: steep Trendelenburg or reverse Trendelenburg to provide the best field of view for the surgeon, longer duration of pneumoperitoneum, especially during the initial part of an operator's learning curve, and limited access to the patient after robot docking. However, the additional challenges for ambulatory anaesthesia are 'risk factors associated with failure to achieve same-day discharge in robotic surgery include patient age, preexisting lung disease, occurrence of intra-operative complications, and surgery end time'.^[10] Other similar challenges are exemplified by applying ambulatory anaesthesia in a premature infant: for example, a case report of a premature infant presenting for laser treatment of retinal detachment performed under general anaesthesia, who was successfully discharged home the same day.^[11]

Over the past two to three decades, ERAS has emerged as a dominant theme in surgical and anaesthetic practice. Good analgesic and anaesthetic practices are essential components of ERAS protocols. While the early ERAS protocols did not distinguish much between inpatient and outpatient surgeries under ERAS protocols, the recent shift from inpatient to outpatient procedures has also mandated a focus on ERAS protocols incorporating ambulatory anaesthesia principles and practices.^[12–14] Ambulatory anaesthesia has to meet the challenges of ERAS protocols. Similar guidelines have recently been published for NORA protocols as well.^[6]

So long as surgical and non-surgical procedures continue to evolve beyond the confines of traditional inpatient or hospital-based settings to outpatient, office-based or free-standing settings, ambulatory anaesthesia must evolve to fulfil its quintessential duty to provide relief to the patients undergoing such procedures without compromising their safety. This is how the next step in ambulatory anaesthesia has to come about – from ‘stepping out’ to ‘STEPPING FORWARD’!

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