

Patient recovery and the post-anaesthesia care unit (PACU)

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Abstract

Patient recovery is a period of active patient monitoring and management during which time return of airway reflexes and respiratory and cardiovascular stability should be achieved. The post-anaesthetic care unit is the specially designed clinical area in which staff trained in the recognition and management of the potential complications arising during this time care for patients. National guidance on the responsibilities and training of staff, the monitoring required during the recovery period and criteria for discharge serves to ensure patient safety and efficient theatre throughput.

Keywords Minimum monitoring; PACU; post-anaesthetic care unit; recovery; staff training

Royal College of Anaesthetists CPD Matrix: 1A03, 1C01, 1C02, 1D02, 1I02, 1I05

The challenge of post-anaesthesia care

With an ageing population, improved management of chronic health conditions and advances in modern surgical interventions, anaesthetists are caring for increasing numbers of patients with multiple co-morbidities often undergoing complex surgical procedures. As a result, the scope of post-anaesthesia care has evolved significantly.

The analogy of landing an aeroplane being as dangerous as takeoff is often used to describe the period of emergence from anaesthesia. The subsequent period of recovery from anaesthesia is also not without risk and therefore patients who have undergone central neuraxial or general anaesthesia should be cared for in specially designed and staffed clinical areas called the post-anaesthesia care unit (PACU). National guidelines exist for the provision of immediate postoperative care^{1,2} and many of the descriptions in this article are aligned with these. National guidelines should be used to inform local and trust guidelines.

Patient recovery

The recovery period encompasses the time during which patients regain consciousness and the ability to communicate, regain the

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Learning objectives

After reading this article, you should be able to:

- describe the organization and requirements of a safe post-anaesthetic care unit
- understand the need for monitoring in a specific PACU setting
- list the equipment required for patient monitoring during recovery from anaesthesia
- describe the responsibilities of the anaesthetist in PACU

ability to maintain and protect their airway and achieve cardiovascular and respiratory stability.

Post-anaesthesia care unit (PACU)

The PACU, often referred to as the recovery room, is a specifically designed clinical area within the theatre complex in which patients receive ongoing care after surgery and anaesthesia. These areas are staffed by trained individuals who provide direct patient care until fitness for discharge to ward-based care or in some cases, transfer to higher-level clinical areas, is achieved.

PACU personnel and training

These areas should be staffed by appropriately trained practitioners, with the ultimate responsibility lying with the anaesthetist until patients are fit for discharge from recovery or handed over to another clinician such as critical care.

An anaesthetist should be available to assess and manage patients in the PACU where the clinical need arises, and an emergency call system should be utilized to summon urgent help when a critical incident occurs.

Patients should receive one-to-one care from a registered practitioner until they are fit for discharge to a ward. However, there should be at least two staff members present in the PACU until fitness for discharge has been achieved. The Association of Anaesthetists of Great Britain and Ireland (AAGBI) set out standards for registered practitioners in the PACU and the UK National Core Competencies for Post Anaesthesia Care³ describes the professional and clinical components required (Table 1).

Continued professional development is necessary to maintain standards and ensure knowledge and skills are obtained and updated when new techniques and advances are made, such as difficult airway management and pain management techniques. Simulation and skills drills are means by which resuscitation algorithms and management of anaesthetic and surgical emergencies can be rehearsed. These need not be high fidelity and allow training of the integrated multidisciplinary team.

PACU equipment and location

Recommendations for monitoring standards are published by the AAGBI and these include recovery from anaesthesia.⁴ Equipment necessary to meet the standards include a minimum of:

- pulse oximetry
- ECG
- non-invasive blood pressure
- capnography where an endotracheal tube or supraglottic device is in situ
- temperature measurement device.

UK national core competencies for post anaesthesia care

| Professional | Clinical |
|---|--|
| <ul style="list-style-type: none"> • Communication • Professional development • Clinical leadership • Clinical governance | <ul style="list-style-type: none"> • Assessment and management of the airway • Assessment and management of breathing • Assessment and management of the circulation • Assessment of consciousness • Monitoring during the immediate postoperative phase • Intravenous access and fluid balance • Applied knowledge of pharmacology in perioperative care • Management of postoperative pain • Management of postoperative nausea and vomiting (PONV) • Management of surgical and anaesthetic emergencies |

Table 1

Given that serious and rapidly progressing clinical emergencies can occur in the PACU, having specifically designed equipment trolleys, boxes or 'grab bags' can aid immediate management. These include resuscitation and airway rescue trolleys, anaphylaxis, malignant hyperpyrexia and local anaesthetic toxicity packs. Laminated treatment algorithms at the bedside for such emergencies also aid management of these stressful and challenging situations.

The PACU should be centrally located in the theatre complex and ideally involve short transfer time from individual theatres. Where transfer times are longer than a few minutes or a patient's condition requires continuous monitoring this should be continued via portable monitoring en route to PACU. Compatibility of systems between theatre and PACU minimizes the time taken to re-establish monitoring and should be encouraged and considered when purchasing equipment.

Handover

Integral to good quality continuity of care is effective handover of clinical information. During a patient's perioperative journey, multiple handovers will take place from their preoperative care location, theatre, PACU and ultimately discharge to the postoperative patient destination.

Where the PACU is immediately adjacent to the theatre suite, handover of information between the anaesthetist and PACU practitioner should commence once monitoring has been re-established and stability confirmed. This ensures patients are unmonitored for the minimum length of time and attention is less likely to be diverted during handover. Checklists can be developed as an aid memoire to improve handover. A handover can take many forms but one suggested format would be an SBAR approach (situation, background, assessment, recommendation).

Situation:

- patient name and age
- operation undergone.

Background:

- past medical history of note
- drug allergies
- anaesthetic technique (including airway management, analgesia, antiemetics administered and intravenous fluids)
- any surgical or anaesthetic intraoperative significant events or complications (such as difficult airway management, blood loss, cardiovascular instability).

Assessment:

- airway: patency, device insitu, anticipated difficulty
- breathing: oxygen requirement, respiratory rate, need for capnography
- circulation: CVS stability, presence of vasoactive infusion, invasive monitoring.

Recommendations:

- requirement for ongoing monitoring: type and duration required
- analgesic plan
- antiemesis
- fluid management: oral intake or IV fluid requirement
- investigations required in PACU: blood tests such as full blood count, CXR
- additional information: drains, special dressings.

Handover to ward staff should be equally thorough. In our institution a discharge proforma detailing the SBAR information is documented for patients transferred from PACU to HDU and ICU, or for patients in whom additional interventions and investigations have been carried out in the PACU.

Clinical challenges encountered in the PACU

Respiratory

A fully conscious patient who has regained protective airway reflexes and can maintain their own airway is required to meet discharge criteria. Before this has occurred it should be borne in mind that airway obstruction can develop quickly and with serious consequences to the patient as a result of post-obstructive pulmonary oedema and hypoxaemia.

Many patients will arrive in the PACU with a supraglottic device in situ. Continuous capnography is recommended during their use to allow early detection of airway obstruction as well as hypoventilation resulting in hypercapnia. Staff should be trained in the removal of such supraglottic airway devices. In the case of an endotracheal tube, the responsibility for its removal lies with the anaesthetist. Delegation of this duty may only occur when staff are trained and prepared to assume responsibility. Again capnography should be utilized until extubation occurs.

The 4th National Audit Project demonstrated that airway complications can and do occur during the recovery period. As a result, it is recommended that an airway management plan be discussed during the handover of patients to PACU staff in patients at risk of airway complications. A full range of difficult airway equipment and experienced staff should be readily available.⁵

Postoperative pulmonary complications (PPCs) may occur in as many as one-fifth of patients having major surgery.⁶ The earliest recognition of PPCs is often in the PACU. A number of patient, anaesthetic and surgical factors may influence the development of PCCs. In addition to clinical signs, monitoring of

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