

POSTOPERATIVE CARE

Recommendations

Postoperative problems are common. It is essential that doctors who care for surgical patients should be trained in the management of these problems.

If a medical team is involved in a patient's perioperative care it should also be involved in any morbidity/mortality review of the case and receive a copy of the discharge summary and, where applicable, the autopsy report.

The maintenance of accurate fluid balance charts by nursing staff is vital; medical staff should review these daily.

INTRODUCTION

This section of the report will examine postoperative ward care. Most patients can anticipate an uncomplicated recovery after their operation. The patients in this sample are amongst the most seriously ill and are vulnerable to complications, so they require meticulous medical and nursing care. Data returned to NCEPOD shows that some patients do suffer from oversight, errors of diagnosis and poor clinical judgement during their ward care. Throughout this section there are examples where there was evidence of a lack of teamwork between nursing, surgical, medical and critical care staff. NCEPOD does not undertake in-depth case review, so cannot determine whether sub-standard ward care arises from failures by individuals or systems, e.g. too few staff, staff who are poorly trained or inadequate

supervision of inexperienced staff. Whatever the cause, it cannot be assumed that the types of errors described here are confined to those patients who die. Mistakes in care lead to increased morbidity, distress for patients and their relatives, longer hospital stay and increased health economy costs.

RECORD KEEPING

Medical record keeping is sometimes of a poor standard and needs to be improved. Poor medical records compromise clinical care.

The documents submitted to NCEPOD for this report show that, whilst some record keeping is exemplary, poor medical notes are not uncommon.

Case Study 41

A 76-year-old, ASA 3 female without recognised co-existing medical disorders had a mastectomy and axillary clearance. Three days later she collapsed with diarrhoea, hypotension and hypoxia. There were no entries in the medical notes between her clerking on admission and this collapse, at which time the entry was "low BP all the time after mastectomy". By this time the patient was in fast atrial fibrillation, dehydrated and in renal failure. Despite aggressive resuscitation she died later that day. The autopsy reported cardiac failure due to left ventricular hypertrophy and atrial fibrillation.

Case Study 42

An 83-year-old, ASA 2 female with pre-existing renal impairment fractured her hip and underwent a hemiarthroplasty. Her blood pressure was low, both in theatre and in recovery, and transfer to a HDU might have been advisable. But after 1 hour 40 minutes in recovery she was returned to the ward at 18.25. There were no entries in the medical notes until 03.50, three days later. At this time she was found unresponsive, cold and clammy and the duty house officer was called. Blood tests showed her creatinine had risen from a preoperative value of 242 micromol/l to 457 micromol/l and her serum potassium was 6.8 mmol/l. She died two hours later.

Why were there no records of these patients' postoperative progress before their death? Had there really been no review of their condition for three days? Had no one noticed that they had been deteriorating?

Poor medical records are not acceptable. The General Medical Council states [28] "...you must: keep clear, accurate, legible and contemporaneous patient records which report the relevant clinical findings, the decisions made, the information given to patients and

any drugs or other treatment prescribed". The Clinical Negligence Scheme for Trusts [29] devotes one of its ten general standards, Standard 6, to Health Records. In the 2001 NCEPOD report [2] the result of a small survey of notes using the CRABEL scoring system [30], a tool for auditing medical records, was presented and this highlighted a wide variability in their quality. These findings were similar to those of the Audit Commission [31].

Poor medical records can compromise medical care, especially now that there is less continuity of care with the introduction of trainee doctors working partial and full shifts. They also expose the hospital to an increased risk if there is litigation. There is an implication that when there is no entry in the notes no one has actually seen the patient, and for almost all the patients in this sample their medical condition was such that a formal daily review was indicated. From the evidence of notes submitted to NCEPOD it is also likely that some consultants do not review what their trainees write, and therefore the extent of their involvement in the supervision of trainees, and in the care of sick patients, must be questioned. Regular departmental audit of medical notes, perhaps using a scoring system such as CRABEL, is required by CNST; this ought to result in improved record keeping.

NURSING CARE

NCEPOD has commented before about failures in nursing observations, in particular the low priority given to accurate recording of fluid balance [26]. Inadequate charting of observations was also noted in this sample.

Case Study 43

A 76-year-old, ASA 3 female with COPD was admitted with a fractured neck of the femur. The following day she had a hemiarthroplasty and at 13.20, one hour after returning to the ward, she was noted to have a blood pressure of 90/50 mmHg and a pulse of 120 beats/min. There was no medical intervention and all observations were discontinued at 23.00. At 06.00 the following morning the patient herself told the staff that she had not passed urine since admission. At 07.30 she complained of feeling faint and her blood pressure was 55/45 mmHg. An echocardiogram revealed right ventricular dilatation with poor contractility. CT scanning excluded pulmonary embolus. She died later that day.

Case Study 44

An 86-year-old, ASA 3 female with COPD, IHD, CCF and renal impairment was admitted with a fractured neck of femur. Her preoperative serum creatinine was 422 micromol/l. She had a dynamic hip screw inserted under spinal anaesthesia at 17.00 on the day of admission. No fluid balance charts were kept before or after the operation. At 07.30 on the second postoperative day (36 hours after surgery) it was noticed that the patient had been anuric since her operation. She died the following day in acute on chronic renal failure with pulmonary oedema.

Case Study 45

An 84-year-old, ASA 3 female with long-standing bronchiectasis and hypertension was admitted with a fractured neck of femur. On arrival in the anaesthetic room, whilst breathing air, her oxygen saturation was 70% and she was returned to the ward for treatment of a chest infection. She had her operation, a dynamic hip screw, four days later. Throughout this prolonged preoperative period there were repeated entries on her fluid charts of "wet bed + + +" and no estimation of fluid balance. A urinary catheter was finally inserted in the operating theatre.

From the information available NCEPOD cannot identify the cause of such failures and so it can only raise questions:

- Is there always sufficient nursing staff on the ward to care for the number of patients and their level of nursing dependency?
- Is there sometimes too much reliance placed on support workers to record and communicate observations?
- From the evidence of the first case, is there a particular problem during the night?
- It may be that there has been a medical instruction to discontinue observations. If so, should this be recorded in the nursing notes? Nursing notes are not currently requested by NCEPOD.

From records submitted to NCEPOD it is clear that the nursing staff need to audit their observations and fluid balance charts on a regular basis to confirm the monitoring is appropriate to the clinical condition of the patient. Nurses must also alert medical staff when observations indicate impending or actual problems.

SURGICAL CARE

Bleeding, hypotension and oliguria, either together or separately are common postoperative problems. The causes of hypotension and oliguria may be complex and include fluid loss, cardiac failure, renal failure and the effect of epidural or spinal analgesia.

Bleeding

Case Study 46

A 44-year-old female was admitted with ascites and subacute small bowel obstruction. She had a complicated medical history that included myelofibrosis and essential thrombocytopenia, a CVA, several TIAs, portal vein thrombosis, liver and renal impairment and colitis. Her tests of clotting function were normal preoperatively. The obstruction failed to resolve and she underwent a laparotomy, at which a section of fibrotic distal small bowel was resected and an ileo-transverse anastomosis performed. General anaesthesia included CVP and arterial pressure monitoring. The patient returned to, what was described as, a HDU on a surgical ward at 15.00. At 21.00 the surgical SHO on-call was asked to review her because her pulse rate had increased to 120 beats/min and she had had minimal urine output for three hours. The SHO noted a positive fluid balance of 1500 ml, but made no comment on the CVP, and further IV fluids were prescribed. By 22.30 the patient's pulse rate had increased to 140 beats/min, her blood pressure was 100/60 mmHg and it was apparent that she had suffered a further CVA. It is not clear when a blood test was taken, but it was only at 01.30 that night, when the haemoglobin was found to be 3.1 gm/dl, that a diagnosis of bleeding was considered. A second laparotomy at 03.00 confirmed blood loss into the abdomen. The patient died later that day.

Case Study 47

An 87-year-old female had a cholecystojejunostomy to relieve jaundice caused by a carcinoma of the head of the pancreas. She was otherwise fit. At 04.00 on the second postoperative night the urine output decreased, but this was not reported to the on-call doctor until 07.00, by which time it had been 4 ml/hour for two hours. No action was taken. The SpR ward round took place at 09.00, at which time the patient showed clear signs of hypovolaemic shock. Blood results showed a haemoglobin level of 3.7 gm/dl; there was evidence of a coagulopathy and the patient died that evening.

In these cases, there was a failure to interpret the observations and clinical findings compounded by a lack of action to correct the situation.

Hypotension

Case Study 48

An 86-year-old male required a proximal femoral nail for a complex intertrochanteric fracture of the femoral neck. He was known to have angina and treated hypertension. In the recovery ward at 16.00 he had a pulse of 120 beats/min and 500 ml of Gelofusine was administered and he was returned to the general ward. At 23.00 the pulse was still raised at 125 beats/min and the blood pressure was 88/60 mmHg. The surgical SHO on-call noted these findings, and the history of hypertension, but only advised to continue the IV infusion and "...call if required". The patient suffered a fatal cardiac arrest at 04.00 the following morning.

Case Study 49

A 79-year-old female with a fractured neck of femur had a cemented Thompson's hemiarthroplasty. She had a history of ischaemic heart disease and angina. The preoperative haemoglobin was 10.7 gm/dl. The operation took two hours, blood loss was not recorded and no blood was given. A blood test was ordered on the first postoperative day but not reviewed until the morning of the second day, at which time the haemoglobin was found to have been 6.5 gm/dl. By this time, the blood pressure was 75/45 mmHg (her normal BP was 140/70 mmHg). She was prescribed two units of blood that day and a further two units to be given the following day, but she suffered a fatal cardiac arrest at 15.00.

The risks of hypotension and anaemia in these patients with cardiac disease appeared to be poorly recognised.

Oliguria

Case Study 50

A 91-year-old, ASA 3 female underwent open reduction and internal fixation of a fractured ankle on the day of her admission. Her preoperative serum creatinine was 178 micromol/l and urea 16.4 mmol/l. Postoperatively she was oliguric and on the second postoperative day her IV fluid input was 4125 ml and urine output 538 ml. In the early hours of the morning on the third postoperative day she became acutely

distressed and wheezy, by which time she had amassed a cumulative positive fluid balance of 9.5 litres. She was started on a frusemide infusion at that time, but died one hour later.

Case Study 51

An 89-year-old, 50 kg, generally fit female underwent a transabdominal nephrectomy for carcinoma. The operation was under combined general and epidural anaesthesia and was uneventful. The fluid charts were well completed clearly showing intravenous fluids of 3000 ml to 4000 ml per day and urine outputs between 1000 ml and 1200 ml per day so that by 02.00 on the third postoperative day she was in a total postoperative positive fluid balance of 8.5 litres. At that time she became agitated, wheezy and short of breath, and she suffered a fatal cardiac arrest one hour later. An autopsy confirmed severe pulmonary oedema. The surgical questionnaire was not returned.

of operations require different postoperative fluid strategies. Often there was a failure to recognise that those with certain comorbidities, for example cardiac, vascular or renal disease, are intolerant of even moderate hypovolaemia, anaemia or fluid overload.

Of note, most of these patients were deteriorating overnight and were being assessed by SHO surgeons. The decision-making in these cases is questioned. All doctors in training are supervised by their consultants and, in particular, SHOs have access to more senior advice - their SpR or consultant - regardless of the time of day. Doctors in training have a duty to recognise the limits of their experience and, in the interests of their patients, must not hesitate to seek advice from a more experienced colleague when it is indicated, regardless of the time of day [33]. The consultant is responsible for supervising doctors in training and must make himself/herself aware of their actions.

The risk of pulmonary oedema developing in these patients was predictable. How closely were the nursing and medical staff monitoring the fluid balance?

The maintenance of accurate fluid balance charts by nursing staff is vital; medical staff should review these daily.

In all these cases, there was evidence that complications were developing well in advance of the ultimate critical event. There were failures by the doctors in training to anticipate complications and monitor the patient's progress, and delays in treatment. When a doctor is called to assess a postoperative complication, the management of it involves a full review of the patient, a presumptive diagnosis, preliminary treatment, subsequent re-appraisal for the effect of treatment and modification of therapy if necessary. This process may also involve consulting with a more senior, experienced doctor. It is clear from the questionnaires and photocopies of medical notes submitted to NCEPOD that such a basic model of medical care is not being followed in all cases. The Royal College of Surgeons stipulates that surgical training posts should provide training in postoperative care [32]. Postoperative complications and their management should be part of the core teaching programme.

Commonly, problems arose from a failure by the doctor in training to appreciate the patient's individual risk factors. Sometimes there was apparently poor recognition that different types

OUTREACH CARE

The benefits of critical care outreach teams still appear to be poorly recognised.

Guidelines to determine which patients should be referred to a critical care team should be developed locally and subsequently validated.

Many hospitals now have critical care outreach teams. The data received by NCEPOD suggests that the benefits of these teams is not universally recognised and often, when they are involved, it is not at an appropriately early time.

under combined general and epidural anaesthesia; no invasive monitoring was used. After two hours in the recovery area she returned to the general ward with an epidural infusion running and instructions on the action to be taken if the urine output decreased. At 01.00 a surgical SHO reviewed her when her blood pressure was 53/37 mmHg and pulse was 112 beats/min. The SHO gave a fluid challenge, after which the BP increased to 80/60 mmHg, and then prescribed two units of blood to be given over four hours. The systolic pressure remained between 55 and 75 mmHg throughout the remainder of the night, but the SHO was not called until 06.00 when the urine output had ceased. A further fluid challenge was given but the patient was not referred to the critical care outreach team until 10.00, when blood gas analysis revealed a base excess of -13.0 mmol/l. She was transferred to the HDU and died two days later.

Case Study 52

A 76-year-old female underwent a laparotomy to drain 300 ml of pus from around the gall bladder. She was recognised as "sick" but no ICU or HDU bed was available, so she returned to the ward postoperatively. The clinical notes and observations showed obvious signs of further deterioration, but no assistance was sought from more senior staff or from the critical care physicians until she suffered a cardiac arrest 36 hours after the operation.

Case Study 53

A 61-year-old male was admitted with abdominal pain and rectal bleeding. He had a history of hypertension and his blood pressure was 170/100 mmHg. An intravenous infusion was started. The preregistration HO on call reviewed him during the night and noted a respiratory rate of 40 breaths/min, blood pressure 100/50 mmHg and pulse rate 150 beats/min. Blood gas analysis revealed a PaCO₂ of 2.94 kPa and base excess of -9 mmol/l. The HO did not appreciate the significance of these findings, nor did he/she discuss them with someone more senior, so appropriate treatment was not instituted. When the patient was reviewed next morning the gravity of the situation was obvious. The patient was referred to the critical care team and, after resuscitation, he underwent a laparotomy for resection of ischaemic bowel.

Case Study 54

An 87-year-old female presented with a carcinoma of the rectum. She was in atrial fibrillation, her chest X-ray showed cardiomegaly and her preoperative BP was 140/80 mmHg. She underwent an anterior resection

These cases illustrate the need for timely review by a critical care outreach team. The report of 2001 [2] recommended that guidelines to determine which patients should be referred to a critical care team should be developed locally and subsequently validated. Such guidelines need to be explicit and understood by both the medical and nursing staff on the ward.

MEDICAL CARE

Medical staffing should be organised so that staff of appropriate seniority are available when a medical opinion is requested.

Postoperative surgical patients with acute or complex medical problems often benefit from shared care between surgeons and physicians. In some cases an appropriate medical review can be invaluable, but the following are examples of how problems can arise.

Case Study 55

An 80-year-old male with COPD underwent sigmoid colectomy. Six days after the operation he became acutely unwell with shortness of breath and tachycardia, and was referred by the surgical team for a medical opinion. At 18.00 he was reviewed by a medical SHO who diagnosed a pulmonary embolus and prescribed enoxaparin and frusemide. By 19.30 the patient's condition had worsened and he was transferred to the ICU. A medical SpR reviewed him at 22.30 and suggested myocardial infarction as an alternative diagnosis to pulmonary embolism. However by 02.00 that night, the patient's condition deteriorated such that he required intermittent positive pressure ventilation to the lungs. Data acquired from a pulmonary artery catheter strongly suggested systemic sepsis. A laparotomy later that day revealed an anastomotic leak and widespread peritonitis.

Case Study 56

An 88-year-old, 40 kg female was admitted with a fractured neck of femur. She had a history of cardiac failure and atrial fibrillation. On admission she had hypokalaemia that was corrected with intravenous potassium in six litres of 0.9% sodium chloride over two days. On the third day after admission she received an Austin Moore femoral prosthesis under spinal anaesthesia and returned to the ward at 17.30. At 23.00 she developed hypoxia, tachycardia and hypotension. A medical SpR reviewed her, mistakenly made a diagnosis of pneumonia and started antibiotics. 36 hours later the medical team reviewed her again when she became extremely short of breath with a pulse rate of 140 beats/min, but she suffered a cardiac arrest shortly after. An autopsy found no signs of pneumonia but did show signs of cardiac failure.

Case Study 57

A 76-year-old male had a femoro-popliteal arterial bypass graft under combined spinal and general anaesthesia. He had a history of type 2 diabetes mellitus, hypertension and hypercholesterolaemia. On the second postoperative night, 36 hours after the operation, he complained of chest pain of two hours duration. The surgical HO reviewed him at 01.45. The patient was sweaty, tachycardic, hypotensive and had signs of left ventricular failure. The ECG showed changes of myocardial ischaemia. The surgical HO organised some blood tests that showed a haemoglobin of 9.0 gm/dl and at 02.20 discussed the case on the telephone with a medical SHO. The medical SHO thought the patient might be in supraventricular tachycardia and advised adenosine. At 03.40 the adenosine had been tried without effect. At 04.30 there was further discussion with the medical SHO who suggested amiodarone, and it was agreed to transfuse two units of blood, but not until daylight. At 05.35 the patient developed frank heart failure that was rapidly followed by cardiogenic shock and despite treatment he died at 12.55.

Case Study 58

An 85-year-old, 50 kg male had a gastroenterostomy to relieve gastric obstruction caused by a malignant ulcer. He suffered from type 2 diabetes mellitus, hypertension and mild angina. He was reviewed on the second postoperative day because of a poor urine output, moderate hypotension and arterial blood gas analysis revealed a PaO₂ of 5.2 kPa and base excess of -7.6 mmol/l. He had a cumulative positive fluid balance of six litres since the operation. A medical SpR reviewed him and noted that his JVP was raised to the earlobes and he had a right basal pleural effusion. The ECG showed that his heart rhythm had changed from sinus to atrial fibrillation, and there was ST segment depression in leads V5 and V6. The medical SpR was of the opinion that a cardiorespiratory cause for the patient's deterioration was unlikely, but that he might have suffered an intra-abdominal event. A laparotomy was performed later that day at which no new intra-abdominal pathology was found. The patient died the following day. An autopsy showed extensive ischaemic heart disease and signs of a recent myocardial infarct.

These case studies illustrate the difficulties of making a diagnosis in complex postoperative surgical cases, and it must be accepted that the correct one is often more obvious with the benefit of hindsight. However, they also illustrate the need for a clear process for

referral of patients from the surgical to the medical team. It is inappropriate for the referral and review of a critically ill patient to be at SHO level or lower, and in such a situation, telephone advice without examining the patient is unacceptable. Ideally an experienced surgical SpR or consultant should review the patient before referral in order to exclude surgical problems; the case certainly should be discussed with one of them. Once referred, a medical consultant or SpR Year 3, preferably with experience in postoperative complications, should review the patient. Whenever possible the review should be made jointly by the specialties so that the case can be fully discussed. The medical team should receive feedback on the outcome of those patients whom they have reviewed, notification of any autopsy date, an autopsy report or discharge summary and be involved in the mortality/morbidity review process.

