



An Age Old Problem

A review of the care received by elderly patients undergoing surgery

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A report by the National Confidential Enquiry into Patient Outcome and Death (2010)

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Principal recommendations

Chapter 2

Routine daily input from Medicine for the Care of Older People should be available to elderly patients undergoing surgery and is integral to inpatient care pathways in this population. (Trusts, Clinical Directors and Commissioners)

Chapter 3

Comorbidity, Disability and Frailty need to be clearly recognised as independent markers of risk in the elderly. This requires skill and multidisciplinary input including, early involvement of Medicine for the Care of Older People. (Clinical Directors and Trusts)

Chapter 4

Delays in surgery for the elderly are associated with poor outcome. They should be subject to regular and rigorous audit in all surgical specialities, and this should take place alongside identifiable agreed standards. (Clinical Directors and Governance Leads)

All elderly surgical admissions should have a formal nutritional assessment during their admission so that malnutrition can be identified and treated. (Trusts, Hospital Nutrition Teams)

Chapter 5

Temperature monitoring and management of hypothermia should be recorded in a nationally standardised anaesthetic record. This is particularly important in elderly patients. (Clinical Directors)

There should be clear strategies for the management of intra-operative low blood pressure in the elderly to avoid cardiac and renal complications. Non invasive measurement of cardiac output facilitates this during major surgery in the elderly. (Clinical Directors and Specialist Associations)

Chapter 6

There is an ongoing need for provision of peri-operative level 2 and 3 care to support major surgery in the elderly, and particularly those with co-morbidity. For less major surgery extended recovery and high observation facilities in existing wards should be considered. (Commissioning Leads, Trusts, Clinical Directors)

Post operative acute kidney injury (AKI) is avoidable in the elderly and should not occur. There is a need for continuous postgraduate education of physicians, surgeons and anaesthetists around the assessment of risk factors for the development of AKI in the elderly surgical patient. (Postgraduate Deans, Medical Directors)

Pain is the 5th vital sign, and requires the same status as heart rate and blood pressure in the assessment and management of all patients. Clear and specific guidance on recognition and treatment of pain in the elderly should be widely available and incorporated into education programmes. (Clinical Directors, Postgraduate Deans, Trusts)

Chapter 7.1

The British Orthopaedic Association and The British Geriatrics Society should provide more specific guidance on the ideal levels of seniority and speciality input into the assessment and decision making phase of the care pathway for patients with fractured neck of femur. (British Orthopaedic Association, British Geriatrics Society)

Chapter 7.2

Greater vigilance is required when elderly patients with non-specific abdominal symptoms and signs (diarrhoea, vomiting, constipation, urinary tract infection) present to the Emergency Department. Such patients should be assessed by a doctor with sufficient experience and training to exclude significant surgical pathology. (Trusts, Clinical Directors)

Introduction

The UK has a rapidly expanding population of elderly people. Currently one in five (12 million people) people are pensioners. At present there are approximately one and a quarter million people aged 85 or older. This group is predicted to double in the next 25 years and treble in the next 35.^{1,2}

In 1999, NCEPOD published a report, *Extremes of Age*³ and recommendations were made in this report around the care of the elderly surgical patient. The report emphasised the importance of team working, and the involvement of the appropriate level of clinician, in terms of seniority and experience, in the care of the patient. It highlighted the importance of post operative care, especially in terms of the availability of a high dependency unit. It was recommended there be sufficient, fully staffed daytime theatre and recovery facilities to ensure no elderly patient requiring an urgent operation waited more than 24 hours once fit for surgery. There was an identifiable need for specialised and experienced healthcare staff to ensure patients were receiving appropriate pain management.

The 2001 National Service Framework (NSF) for older people⁴ recognised that care of the elderly in hospital is complex. It recommends that older people be given the early supervision and advice of a specialist team when admitted to an acute general hospital. In particular it stated that there should be involvement of a consultant in old age medicine or rehabilitation, so that appropriate treatment and management decisions are made. As well as medical consultants who care for the elderly, specialist nurses/nurse consultants, physiotherapists together with occupational therapists, speech and language specialists, dieticians, social workers and care managers; and pharmacists are required.

Recommendations extended to emergency care with a particular focus on transfer from the Emergency Department (ED) as soon as possible. Other common themes are attention to fluid balance, pain management, pressure sore risk management, falls and immobility, nutritional status and cognitive impairment. There is recognition that with advancing age there is an increased risk of post operative complications, which in part relates to a higher incidence of coexisting disease.

In relation to acute surgery, the NSF recommends that operations for fractured hip repair (which make up a large percentage of operations in the elderly) should be carried out within the first 24 hours of admission, and patients should be mobilised within the first 48 hours where appropriate. Discharge from hospital needs to be carefully planned with the full involvement of a multidisciplinary team, the family and carers.⁴

What are the main reasons for surgical admission? In 1997/98 NCEPOD³ found that the most common operative procedures were hemiarthroplasty and sliding hip screw (24% and 23% respectively), laparotomy (13%) and amputation.

Falls represent half of hospital admissions for accidental injury and many of these are in the over 65 group and involve the femur.⁵ We know that half of patients with a hip fracture never regain full mobility and one in three dies within three months. However, the recent Royal College of Physicians Falls Audit demonstrated that many patients with fractured neck of femur still took > 48 hours to reach the operating theatre.⁶ It is very difficult to tell whether patients who wait > 24 hours for surgery do so because of inferior systems of care or because comorbidity precludes early surgery.^{7,8}

Future studies therefore need to try and identify whether patients wait > 24 hours when they have been declared fit and ready for surgery.

Laparotomy and bowel resection is one of the most commonly performed major operations in the elderly both in the elective and emergency setting. These patients may present for surgery with acute fluid and electrolyte imbalance due to the combined effects of inadequate intake relative to fluid loss, which may be superimposed on reduced renal reserve and (in the emergency setting) sepsis and third space losses. They require skilled resuscitation, careful peri-operative monitoring of cardiovascular parameters and fluid balance. This needs to commence preoperatively, and be continued into the intra-operative and post operative period.

In this study NCEPOD will review a sample of deaths following emergency and elective surgery in the elderly population.

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Method and data returns

Aim

To explore remediable factors in the processes of care of patients aged 80 or older who died within 30 days of a surgical procedure.

Objectives

The expert group identified objectives that would address the overall aim of the study and these will be explored throughout the following chapters:

- Fluid management
- The seniority of clinicians involved in intra-operative care
- Delays in surgery (due to scheduling, and the management of the patient's physical status)
- Anaesthetic management including pre-operative assessment
- Acute pain management
- Post operative cognitive dysfunction
- Use of critical care facilities
- Nutrition
- Comorbidities
- Medications including thromboembolism prophylaxis
- Consent
- Prevention of peri-operative hypothermia

Expert group

A multidisciplinary group of experts comprising consultants from surgery, anaesthetics, medicine for the care of older people, (MCOP) trauma and orthopaedics, intensive care medicine, nursing, the Institute for Ageing and Health, a lay representative and a scientific advisor contributed to the design of the study and reviewed the findings.

Population

All patients aged 80 and over who died within 30 days of a surgical procedure carried out between 1st April 2008 – 30th June 2008 were included in the study.

Hospital participation

National Health Service hospitals in England, Wales and Northern Ireland were expected to participate, as well as hospitals in the independent sector and public hospitals in the Isle of Man, Guernsey and Jersey. Within each hospital, a named contact, referred to as the NCEPOD Local Reporter, acted as a link between NCEPOD and the hospital staff, facilitating case identification, dissemination of questionnaires and data collation.

Exclusions

A number of Office of Population Censuses and Surveys (OPCS) classification of intervention and procedure codes were excluded where performed in isolation. Patients who were discharged alive from that episode of care, or who died more than 30 days following their surgical procedure were also excluded.

Case ascertainment

Cases were identified using OPCS codes. The NCEPOD Local Reporter identified all patients who died within their hospital(s) during the study period, within 30 days of a surgical procedure (the first/primary surgical procedure of their final admission). The information requested for each case included the details of the surgeon and anaesthetist

who carried out the procedure. All cases identified to NCEPOD with an included OPCS code were included in the study.

Questionnaires and case notes

Three questionnaires were used to collect data for this study, one surgical questionnaire; one anaesthetic questionnaire where applicable; and one organisational questionnaire per site.

Surgical questionnaire

The surgical questionnaire was sent to the surgeon who carried out the primary procedure of the final admission. This questionnaire covered all aspects of patient care from admission, to death. The number of questionnaires was not limited per surgeon. These questionnaires were either sent directly to the surgeon or via the local reporter for dissemination depending on the Trust.

Anaesthetic questionnaire

The anaesthetic questionnaire was sent to the anaesthetist whose care the patient was under at the time of their procedure. This questionnaire covered all aspects of patient care from admission, to death, and again the number of questionnaires was not limited per anaesthetist. The anaesthetic questionnaire did not need to be completed where the operation was carried out under local anaesthetic. These questionnaires were either sent directly to the anaesthetist or via the local reporter for dissemination depending on the Trust.

Organisational questionnaire

This questionnaire was used to collect data on a site by site basis so we were aware of the facilities available at each site for each patient in the study. Data collected concerned operating facilities, special care areas, pre- and post operative assessment facilities, and audit.

The organisational questionnaire was sent to the Local Reporter for completion in collaboration with the relevant specialties, and the Medical Director was also informed of this at the same time, and asked to contribute as appropriate.

Case notes

For each case, the following case note extracts were requested to enable peer review:

- Pre-assessment clinic notes
- Transfer documentation
- Inpatient and outpatient annotations from pre-admission to death
- Integrated care pathways
- Nursing notes (including Waterlow, Mental State Examination records, Pain Assessment records, Nutrition Assessment records)
- Drug charts
- Imaging reports
- ICU charts
- Fluid balance charts
- Operation notes
- Notes from MDT meetings
- Consent forms
- Pathology results
- Haematology (FBC), biochemistry results (LFT, U&E), EDTA creatinine clearance
- End of Life Pathway documentation
- Incident report form and details of outcome
- Post mortem report
- Discharge summary

- Anaesthetic charts
- Pre-anaesthetic or pre-admission protocols/ checklists
- Recovery room records
- DNAR Report

These were anonymised on receipt at NCEPOD.

Advisor groups

A multidisciplinary group of Advisors was recruited to review the case notes and associated questionnaires. The group of Advisors comprised clinicians from the following specialties: surgery (general and specialty), anaesthesia, medicine (general and the relevant specialties), Medicine for the Care of Older People (MCOP), Trauma and Orthopaedics (T&O), intensive care medicine, radiology and nursing.

All questionnaires and case notes were anonymised by the non-clinical staff at NCEPOD. All patient, clinician and hospital identifiers were removed. Neither clinical co-ordinators at NCEPOD, nor the Advisors had access to such identifiers.

Each case was reviewed by one advisor within a multidisciplinary group. At regular intervals throughout the meeting, the chair allowed a period of discussion for each advisor to summarise their cases and ask for opinions from other specialties or raise aspects of a case for discussion.

All data were analysed using Microsoft Access and Excel by the research staff at NCEPOD.

The findings of the report were reviewed by the Expert Group, Advisors and the NCEPOD Steering Group prior to publication.

The following grading system was used by the Advisors to grade the overall care each patient received.

Good practice – a standard that you would accept for yourself, your trainees and your institution

Room for improvement – aspects of clinical care that could have been better

Room for improvement – aspects of organisational care that could have been better

Room for improvement – aspects of both clinical and organisational care that could have been better

Less than satisfactory – several aspects of clinical and/or organisational care that were well below satisfactory

Insufficient information submitted to assess the quality of care.

Quality and confidentiality

Each case was given a unique NCEPOD number so that cases could not easily be linked to a hospital.

The data from all questionnaires received were electronically scanned into a preset database. Prior to any analysis taking place, the data were cleaned to ensure that there were no duplicate records and that erroneous data had not been entered during scanning. Any fields in an individual record that contained spurious data that could not be validated were removed.

Data analysis

The qualitative data collected from the Advisors' opinions and free text answers in the clinician questionnaires were coded, where applicable, according to content to allow quantitative analysis. The data were reviewed by NCEPOD Clinical Co-ordinators and a Clinical Researcher to identify the nature and frequency of recurring themes. Case studies have been used to illustrate particular themes.

Data returns

Figure 1.1 shows the data returns for the study.

Over the three month period 5612 cases were reported of which 3404 were immediately excluded, usually because the patient had not undergone an appropriate procedure in the 30 days prior to death. A further 452 cases were

found to be unsuitable and thus a total of 3856 patients were excluded. For included cases questionnaires were sent to the consultant surgeon and anaesthetist responsible for the patient’s care and in total 63.7% of surgical and 60.8% of anaesthetic questionnaires were returned together with copied extracts of the case notes in 51.4% of cases; a complete data set was returned in only 600 cases.

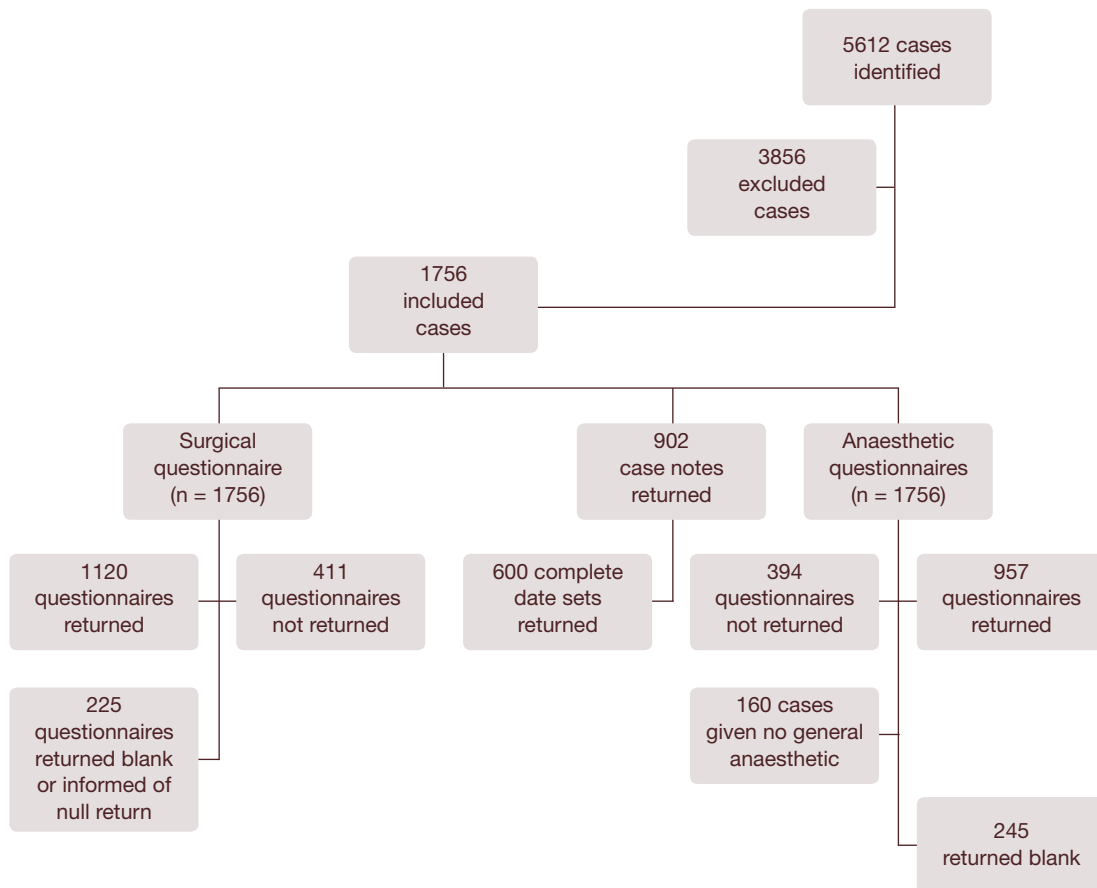


Figure 1.1. Data returns

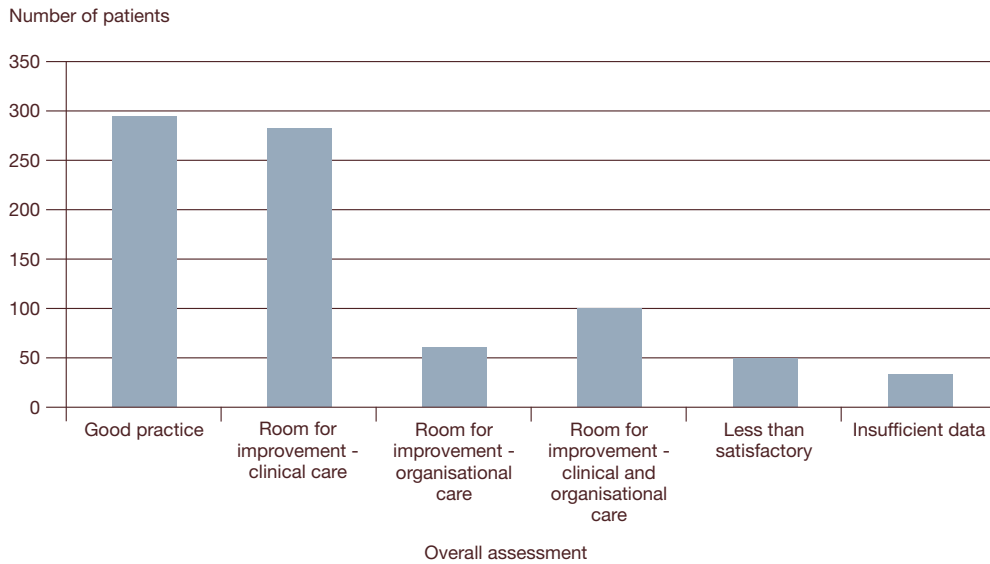


Figure 1.4. Overall assessment of care

Overall assessment of care

As Figure 1.4 shows, only 37.5% (295/786) of the sample was assessed by Advisors as having received good care. 43.6% (343/786) of the sample was assessed as having room for improvement in either clinical or organisational care, and 12.5% (98/786) in aspects of both clinical and organisational care. 6.4% (50/786) of the sample was assessed by Advisors as having received care that was less than satisfactory. In 34 cases, the Advisors did not have enough information in the case notes to make an assessment of the overall level of care received.

Key findings and recommendations

2 – Hospital facilities & multidisciplinary care of the elderly

Key findings

There was a relative paucity of MCOP involvement within this sample of patients at all stages of care despite the recommendations included in the NSF for the Elderly.

Mechanisms for the assessment of nutrition and mental capacity were absent in a number of sites, (30/278 and 62/272 respectively).

Recommendations

Routine daily input from Medicine for the Care of Older People should be available to elderly patients undergoing surgery and is integral to inpatient care pathways in this population. (Trusts, Clinical Directors and Commissioners)

All hospitals should address the need for nutrition and mental capacity to be assessed and documented in the elderly on admission as a minimum standard. (Trusts and Clinical Directors)

3 – Patient comorbidities

Key findings

Comorbidity was extremely common in the elderly surgical population included in this study (1028/1098).

“Frailty” was clearly and independently identified in our study population

Disabilities (Including hearing and visual loss) were common, not well documented and may have led to difficulties in caring for the elderly in the peri-operative period within this group of patients.

Acute illness in the elderly was complicated by pre-existing memory loss and dementia, both of which predispose to confusion in the peri-operative period. In this sample, 185/1001 and 144/1001 were documented as having dementia and/or memory loss.

Documentation of mental capacity in this sample was poor (395/701). When patients were unable to consent independently the correct procedures were followed in the majority of cases.

Some patients in this study were receiving a large variety of medicines (463/740), with a serious risk of drug interactions.

Recommendations

Comorbidity, disability and frailty need to be clearly recognised and seen as independent markers of risk in the elderly. This requires skill and multidisciplinary input including early involvement of Medicine for the Care of Older People. (Clinical Directors and Trusts)

Assessment of capacity and appropriate use of the consent process should be clearly understood and documented by all clinicians taking consent in the elderly. (Clinical Directors)

Medicine reviews need to be a regular daily occurrence in the peri-operative period. Input of both Medicine for the Care of Older People (MCOP) clinicians and an experienced ward pharmacist may greatly assist this process. (Clinical Directors and Trusts)

4 – Pre-operative care

Key findings

Risk assessment may be particularly difficult in the elderly surgical population, and should include input from senior surgeons, anaesthetists and Medicine for the Care of Older People (MCOP) clinicians.

A clinically significant delay between admission and operation occurred in over 1 in 5 elderly patients in this study (174/814), and is one of the major remediable factors identified by Advisors.

Malnutrition is common in elderly surgical admissions, but documentation, nutritional assessment and evidence of appropriate management within this group was extremely poor.

Acute kidney injury at the time of admission was an important cause of comorbidity in this elderly population (186/765) before surgery within this sample.

Pain was poorly assessed and documented. Pre-operative pain management in some patients was absent or inadequate in this sample.

5 – Intra-operative care

Key findings

Consultant involvement in care was high in this group of patients and in most cases the experience of both the surgeon and anaesthetist was judged to be appropriate to the care needs of the patient.

There was frequently a lack of evidence of the monitoring of temperature, and recording of therapeutic interventions to prevent hypothermia within this sample.

Peri-operative hypotension was a common event in this population (438/937), and is likely to have contributed to poor outcome.

Recommendations

Delays in surgery for the elderly are associated with poor outcome. They should be subject to regular and rigorous audit in all surgical specialities, and this should take place alongside identifiable agreed standards. (Clinical Directors and Governance Leads)

Senior clinicians in surgery, anaesthesia and medicine need to be involved in the decision to operate on the elderly. Risk assessment must take into account all information strands, including risk factors for acute kidney injury. (Consultants, Clinical Directors and Trusts)

An agreed means of assessing frailty in the peri-operative period should be developed and included in risk assessment. (Specialist Associations)

Pain must be assessed and managed as a priority before operation. (Consultants and Trusts)

All elderly surgical admissions should have a formal nutritional assessment as soon as practicable after their admission so that malnutrition can be identified and managed appropriately. (Trusts, Hospital Nutrition Teams)

Recommendations

Temperature monitoring and management of hypothermia should be recorded in a nationally standardised anaesthetic record. This is particularly important in elderly patients. (Clinical Directors)

There should be clear strategies for the management of intra-operative low blood pressure in the elderly to avoid cardiac and renal complications. Non invasive measurement of cardiac output facilitates this during major surgery in the elderly. (Clinical Directors and Specialist Associations)

6 – Post operative care

Key findings

Level 2 and 3 care were generally utilised more than 10 years ago. However it was still planned less often (292/790) than would be expected in view of severity of illness/profile of surgery.

Post operative AKI was related to poor intra-operative management of fluids and cardiovascular status (24/151) and was compounded by deficiencies in post operative management.

Particular skills and knowledge are required in assessing and treating pain in the elderly. Pain was not assessed routinely post operatively in all the elderly surgical patients included in this study (135/612).

Continuous infusion based analgesia (such as epidurals and patient controlled analgesia) was used relatively sparingly in this population.

A substantial number of hospitals still do not have acute pain teams (71/279), and many of these are in the independent sector. Those that do may not have funded consultant sessions, nurses or programmes of training.

Recommendations

There is an ongoing need for provision of peri-operative level 2 and 3 care to support major surgery in the elderly, particularly for those with comorbidity. For less major surgery extended recovery and high observation facilities in existing wards should be considered. (Commissioning Leads, Trusts, Clinical Directors)

Post operative Acute Kidney Injury (AKI) is avoidable in the elderly and should not occur. There is a need for continuous postgraduate education of physicians, surgeons and anaesthetists around the assessment of risk factors for the development of AKI in the elderly surgical patient. (Postgraduate Deans, Medical Directors)

Fluid management must be clearly documented, and form part of the routine review and handover between theatres and wards. This should continue on at least a daily basis thereafter, alongside monitoring of biochemical function. (Consultants, Nurses and Governance Leads)

Pain is the 5th vital sign, and requires the same status as heart rate and blood pressure in the assessment and management of all patients. Clear and specific guidance on the recognition and treatment of pain in the elderly should be incorporated into education programmes. (Clinical Directors, Postgraduate Deans, Trusts)

A fully resourced acute pain service (APS) is essential within the context of modern secondary care services. This includes the Independent Sector. (Clinical Directors and Commissioners)

7.1 – Care of fractured neck of femur

Key findings

In 87/302 of cases there was considered to be a clinically significant delay between admission and operation. Delays were still frequent between admission and operation for patients included in this study with fractured NOF, despite BOA and NSF guidelines. Advisors reported a delay in 87/302 cases.

In the opinion of the Advisors trainees did not always seek advice from consultants when this was indicated (66/280 cases).

Initial assessment, and treatment planning was often left to basic grade clinicians.

Pre-operative optimisation of patients did not always occur in a timely manner in the patients included in this study.

The orthopaedic trauma service still relies heavily on trainees and SAS doctors.

Direct input into individual patient care by consultants in MCOP was relatively rare.

Post operative care was often delegated to junior orthopaedic trainees.

Recommendations

The British Orthopaedic Association and The British Geriatric Society should provide more specific guidance on the ideal levels of seniority and speciality input into the assessment and decision making phase of the care pathway for patients with fractured neck of femur. (British Orthopaedic Association, British Geriatrics Society)

The decision about when a patient's physical condition is optimised and when to operate in patients with fractured neck of femur is critical, and requires multi-disciplinary input and expertise. There must be senior surgical, medical and anaesthetic input at this point in the care pathway. (Clinical Directors, Consultants)

7.2 – Care of the acute abdomen

Key findings

Initial assessment of patients, following arrival in the hospital was timely in this group (149/225 cases reviewed within 2 hours of arrival).

There was a high level of consultant surgeon involvement in both making the diagnosis and more particularly in the decision to perform surgery for patients included in this study.

Following admission patients in this population were less likely to be assessed by a consultant if they were admitted to a medical specialty.

Advisors judged the operation not to be performed in a timely manner in 41/190 cases in this group.

Junior staff failed to seek advice about patient management or surgery in 39/186 of patients requiring abdominal surgery.

Input from MCOP was infrequent and markedly less than in patients admitted with a fractured neck of femur.

Recognition of the need for thromboprophylaxis in this group of patients remains sub-optimal. Furthermore, routine assessment of their nutritional requirements and skin viability were poor.

Patients presenting with non-specific abdominal symptoms or signs of sepsis but who subsequently required abdominal surgery were usually admitted under the care of a physician. This may have reduced awareness of the underlying surgical pathology and was associated with greater delays in performing surgery.

Recommendations

Greater vigilance is required when elderly patients with non-specific abdominal symptoms and signs (diarrhoea, vomiting, constipation, urinary tract infection) present to the Emergency Department. Such patients should be assessed by a doctor with sufficient experience and training to exclude significant surgical pathology. (Trusts, Clinical Directors)

The elderly should receive no different level of care from other patients. As NCEPOD has previously recommended¹⁰ when admitted to a medical ward consultant review should occur within 12 hours. (Consultants, Clinical Directors and Commissioners)

Clear protocols for the post operative management of elderly patients undergoing abdominal surgery should be developed which include where appropriate routine review by a MCOP consultant and nutritional assessment. (Clinical Directors)

A robust method of risk assessment for elderly patients presenting with an acute intra-abdominal catastrophe should be developed.

Trusts should audit delays in proceeding to surgery in patients requiring emergency or urgent abdominal surgery and implement appropriate mechanisms to reduce these. (Trusts, Clinical Directors)

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