

**Elective and Emergency Surgery in the Elderly**  
Study protocol

***Expert Group Members***

Dr Christopher Heneghan	Royal College of Anaesthetists
Dr Andrew Severn	Age Anaesthesia Association
Professor Peter Crome	British Geriatrics Society
Professor David Marsh	British Orthopaedic Association
Professor Thomas Lennard	Royal College of Surgeons of England
Professor Tom Kirkwood	Institute for Ageing and Health
Ms Audrey Brightwell	Age Concern

***NCEPOD Steering Group:***

Professor Tim Hendra	Royal College of Physicians
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***NCEPOD Clinical Co-ordinators:***

Dr Kathy Wilkinson	Anaesthesia
Mr Ian Martin	Surgery
Professor Sebastian Lucas	Pathology
Dr Alex Goodwin	Anaesthesia
Dr George Findlay	Intensivist

***NCEPOD Non Clinical Staff:***

Dr Marisa Mason	NCEPOD Chief Executive
Miss Heather Cooper	Clinical Researcher
Dr Neil Smith	Clinical Researcher

## **Introduction**

### *Demographics*

Worldwide the population of elderly people is increasing, with the most rapid increase being in developed countries, and in the oldest groups of the population, (Help the aged, 2008). The UK is part of this demographic change with a steeply increasing aging population. Currently one in five (12 million people) are pensioners-about the same number as the child population. The number of people aged over 65 is expected to rise by over 60% in the next 25 years to almost 15.8 million. 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. (Help the aged, 2008; ONS, 2008). HEADLINE SLIDES ? 2.5 million over 85 by 2035

### *Health economy implications*

This increase in the age of the population will impact on the UK economy in a number of ways, most crucially the number of dependent individuals relative to those in employment. An ageing population also puts pressure on health and social care services. At present 38% of the UK population aged 65 – 74, have a limiting longstanding illness; this figure increases to 50% by the age of 75 and over. Although presently people aged 65 and over make up 16% of the population, they account for almost two thirds of general and acute hospital beds and for 50% of the recent growth in emergency admissions. The NHS spent about £16 billion on people over the age of 65 in 2003/2004, 43% of the NHS budget. In the same year social services spent 44% of their total budget on the same age cohort (£7 billion), (Health Care Commission, 2006)

### *Extremes of age*

In 1999, NCEPOD published a report, Extremes of Age (NCEPOD, 1999 and recommendations were made in this report around the care of the elderly surgical patient. Fluid management was found to be poor, and it was recommended this be given the same status as drug prescription. 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 NSF for the elderly*

The 2001 NSF for older people (Department of Health, 2001) 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, occupational therapists and 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 A&E 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.

*What are the main reasons for surgical admission?*

In 1997/98 NCEPOD 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 (Battle, 2006). We know that half of patients with a hip fracture never regain full mobility and one in ten dies within 30 days (NHS Institute for Innovation and Improvement, 2006). However, the recent RCP Falls Audit demonstrated that many patients with fractured neck of femur still took > 48 hours to reach the operating theatre (Royal College of Physicians, 2007). It is very difficult to dissociate whether patients who wait > 24 hours for surgery do so because of inferior systems of care or because co-morbidity precludes early surgery (Bryson, 2008; Shiga et al, 2008).

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 commonest major operations performed 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 intraoperative and post operative period.

*Complications of surgery and anaesthesia in the elderly*

Emergency surgery has greater risks than elective surgery in the elderly (Linn et al, 1982). This may be because attention can be devoted to getting the patient as fit for surgery as possible so the best possible results are obtained, (Linn et al, 1982).

What other factors affect perioperative outcome ?

*Anaesthesia*

As a result of the increasing elderly population, many of whom require surgery, larger numbers are presenting for general anaesthesia. Such patients require a high degree of attention to detail, and a clear recognition of the changing physiology and drug handling which occurs with age (Dodds, 2007 ) For example, the need for careful management of epidural anaesthesia, has been noted particularly in relation to the elderly patient undergoing laparotomy in the NCEPOD study of 2001. Possibly because of this, and a shortage of HDU beds, recent work has suggested that epidural anaesthesia/analgesia is more often withheld in the emergency setting in the elderly (Walton B, 2006).

*Pain management*

It is known that post operative pain increases the risk of adverse outcome in elderly patients by contributing to tachycardia, hypertension, cardiac ischaemia and

hypoxemia. Effective analgesia can decrease the incidence of myocardial ischemia and pulmonary complications, accelerate recovery, promote early mobilisation, shorten hospital stay and reduce medical care costs. Acute pain management in the elderly is often poor, and has been specifically remarked upon in the NSF for older people; following this guidance has been published with regard to the assessment and management of pain in older people (Royal College of Anaesthetists, 2004; Royal College of Physicians, 2007; British Pain Society & British Geriatrics Society, 2008). The cognitive status of the patient can impact on their ability to control and communicate the pain. Elderly patients may be more likely to under report the experience of pain, and are sometimes managed very conservatively for fear of respiratory depression, (Aubrun 2005).

#### *Post operative cognitive dysfunction (POCD)*

The incidence of cognitive dysfunction in elderly patients is high at around 25% following surgery (Dodds, 2007). It is more common in patients with a history of cognitive impairment, in those aged over 75, and patients having a second procedure or undergoing a lengthy anaesthetic. Some procedures pose a higher risk than others, for example cardiac surgery, neurosurgical or abdominal procedures. Recent research has cast doubt as to whether there is a difference between regional and general anaesthesia in the incidence of POCD (Parker et al, 2004; Royal College of Physicians, 2005; Fodale et al, 2006; Newman, A et al, 2007).

#### *General Post operative care*

Peri-operative hypothermia is common in both young and old patients undergoing a surgical procedure (Leslie et al, 1995; Frank et al, 1995; National Institute for Health and Clinical Excellence, 2008). However the course of this is likely to be longer and more pronounced in the elderly who have reduced body fat and a compromised ability to regain effective thermoregulatory control. Adverse consequences of peri-operative hypothermia include cardiac ischemia and arrhythmias, increased blood loss, wound infection, decreased drug metabolism and increased post operative stay.

#### *Comorbidity*

Many elderly people suffer from hypertension and cardiovascular disease and need careful preoperative assessment (Muravchick, 2000; NICE, 2008). Other common health considerations include diabetes, dementia, sensory impairment, mental health problems, incontinence, stroke and arthritis. (Sorbini, 1968; Chandra, 2004; Schillinger, 2005; Grobhan, 2006; Health Care Commission, 2006; Help the Aged, 2008).

Thus the health of our aging population has many implications for clinicians. Many more older patients are presenting for all types of surgery and as well as the physiological reductions in their reserve, they often have associated complex medical needs (Ballesta Lopez et al, 2002). However, there is some evidence that peri-operative mortality has decreased in the elderly in recent decades. The use of new techniques such as minimally invasive surgery may reduce the incidence of peri-operative morbidity in terms of less post operative pain, fewer cardiorespiratory complications, shortened hospital stay and rapid return to physical activities, (Ballesta Lopez et al, 2002). Further reduction in both morbidity and mortality rates, remains a significant challenge (McGoldrick).

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

### **Aims and Objectives**

### **Overall Aim**

The aim of this study is to explore remediable factors in processes of care of elderly patients who die within 30 days of emergency or elective surgery.

### **Overall Objectives**

The study will explore the following areas of care:

1. Fluid management
2. The seniority of clinicians involved in peri-operative care
3. Delays in surgery (due to scheduling, and the management of the patients physical status)
4. Anaesthetic management including preoperative assessment
5. Acute Pain Management
6. Post Operative Cognitive Dysfunction
7. Use of Critical Care facilities
8. Nutrition
9. Comorbidities
10. Medications including Thromboembolism prophylaxis
11. Consent
12. Prevention of Peri-operative Hypothermia

### **Method**

#### **Design**

Peer review will be undertaken to identify possible remediable factors in the organisation of care using the indicators identified above. Clinical and organisational questionnaires will also be used to obtain quantitative data and clinician views.

#### **Population**

All elderly (defined at the expert group meeting) admitted for an emergency or elective procedure during a (defined at expert group meeting) period.

#### **Exclusions**

The following OPCS codes will be excluded if they have been performed in isolation:

- A52 – Therapeutic: epidural injection
- A55 – Diagnostic spinal puncture
- A83 – Electroconvulsive therapy
- E48 – Therapeutic fiberoptic endoscopic operations on lower respiratory tract
- E49 – Diagnostic fiberoptic endoscopic operations on lower respiratory tract
- G16 – Diagnostic fiberoptic endoscopic examination of oesophagus
- G45 – Diagnostic fiberoptic endoscopic examination of upper gastrointestinal tract
- G47 – Intubation of stomach
- H22 – Diagnostic endoscopic examination of colon
- H25 – Diagnostic endoscopic examination of lower bowel using fiberoptic endoscope
- H28 – Diagnostic endoscopic examination of sigmoid colon using rigid sigmoidoscope
- J13 – Diagnostic percutaneous operation on liver
- J43 – Diagnostic endoscopic retrograde examination of bile duct and pancreatic duct
- J44 – Diagnostic endoscopic retrograde examination of bile duct
- J45 – Diagnostic endoscopic retrograde examination of pancreatic duct
- J67 – Diagnostic percutaneous operation on pancreas
- K49 – Transluminal balloon angioplasty of coronary artery
- K51 – Diagnostic transluminal operation on coronary artery
- K58 – Diagnostic transluminal operation on heart

- K60 – Cardiac pacemaker system introduced through vein
- K63 – Contrast radiology of heart
- K65 – Catheterisation of heart
- K68 – Drainage of pericardium
- L86 – Injection into varicose vein of leg
- M47 – Urethral catheterisation of bladder
- R01 – R35 – Female genital tract associated with pregnancy, childbirth and puerperium
- S09 – Photodestruction of lesion of skin
- S13 – Punch biopsy of skin
- S15 – Other biopsy of skin
- S41& S42 – Suture of skin
- S43 & S44 – Removal of material from skin
- S50 – S53 – Introduction of material into subcutaneous tissue/skin
- T12 – Puncture of pleura
- T43 – Diagnostic endoscopic examination of peritoneum
- T90 – Contrast radiology of lymphatic tissue
- W29 – Skeletal traction of bone
- W90 – Puncture of joint
- X29 – X53 – Injection/transfusion/dialysis/organ donation/resuscitation
- X59 – Anaesthetic without surgery
- Y70 – Y90
- Z01 – Z94

### ***Sample Size***

A sample of approximately 2000 patients will be reviewed.

Based on data collected for the deaths in acute hospitals study, (all in-hospital deaths between 1<sup>st</sup> October 2006 – 31<sup>st</sup> March 2007), in a group of patients aged 80 years or older, there were approximately 12,863 procedures with an included procedure code performed within the six month period; this is approximately 2143 patients a month. Data will be collected over a two month period to ensure a large enough sample size.

### ***Sites***

All hospitals that admit patients for surgery (both emergency and elective) in the National Health Service and Independent sector in England, Wales and Northern Ireland, and public hospitals in the Isle of Man, Jersey and Guernsey, will be included in the study.

### ***Timeframe***

Data will be collected on deaths within 30 days of a procedure between 1<sup>st</sup> May 2008 – 30<sup>th</sup> June 2008.

### ***Case Identification***

Cases will be identified using OPCS codes.

An NCEPOD Local Reporter in each hospital will be asked to identify all patients that underwent a surgical procedure and died within 30 days between 1<sup>st</sup> May 2008 – 30<sup>th</sup> June 2008 and input that data into the spreadsheet provided by NCEPOD.

Once patients who have died following surgery have been identified, a questionnaire will be sent to the surgeon and anaesthetist involved in the case. Casenote extracts will also be requested. The questionnaires and associated casenote extracts will then be

reviewed by a multidisciplinary group of clinicians and aggregated data analysed quantitatively.

### ***Data Collection***

Three questionnaires will be used in this study:

- Organisational Questionnaire

For the purpose of this study, 'organisation' will be defined as a hospital/centre not a Trust. This will give a clearer picture of the facilities and care received by the patient at that particular site rather than by the Trust as a whole. An organisational questionnaire will be sent to the NCEPOD Local Reporter/study contact for each site. The questionnaire is designed to collect data on topics such as hospital/site facilities, staff numbers and clinical protocols.

- Surgical Questionnaire

A questionnaire will be sent to the surgeon responsible for the patient at the time of death.

- Anaesthetic Questionnaire

A questionnaire will be sent to the anaesthetist responsible for the patient at the time of death.

- Casenote extracts

Copied extracts of the casenotes will be requested to be returned alongside the questionnaires. These will include;

- Pre-assessment clinic notes
- 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

An assessment form will be developed. NCEPOD staff will complete data fields based on the patients casenotes. The notes will be made anonymous and sections of the

assessment form left blank for a panel of advisors to complete. They will be asked to give their expert opinion on the care the patient received during that admission.

***Pilot Study – case identification***

Questionnaires will also be piloted in a number of sites, through NCEPOD clinical coordinators and the Expert Group. They will be asked to disseminate questionnaires to their colleagues, who will be asked to return the completed questionnaires to NCEPOD with any comments they have with regards to ease of completion.

**Analysis and Review of Data**

***Advisors***

A multidisciplinary advisory group will review the data collected and provide expert opinion on the process of care and management of elderly patients undergoing emergency and elective surgery. Advisors will be both surgical and anaesthetic and come from across all specialties.

All identifiable information will be removed prior to review by the advisors, i.e. all data will be anonymised (see below).

***Confidentiality and Data Protection***

Once the data have been extracted by the NCEPOD researchers, the questionnaires and case notes will be anonymised to remove patient, clinician and hospital identifiers prior to review by the Advisory Group.

All electronic data are held in password protected files and all paper documents in locked filing cabinets. As soon as possible after receipt of data NCEPOD will encrypt electronic identifiers and anonymise paper documents. Section 60 approval has been obtained to perform this study without obtaining patient consent.

Approval for the study methods of all NCEPOD studies is granted by the Patient Information Advisory Group (PIAG) during an annual review.

***Dissemination***

On completion of the study a report will be published and widely disseminated.

## Timescale

<b>Main Event</b>	<b>Date</b>
<i>Pilot</i>	<i>September 2008</i>
<i>Data collection</i>	<i>January 2009</i>
<i>Advisory Groups</i>	<i>May 2009</i>
<i>Data Analysis</i>	<i>February 2010</i>
<i>Publish Report</i>	<i>Autumn 2010</i>

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