



# Neurosurgical Care in the Elderly: Increasing Demands Necessitate Future Healthcare Planning

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■ **OBJECTIVES:** The worldwide elderly population is steadily increasing. It has been recommended that age-appropriate information should be available for older patients, but little exists in neurosurgery. We aim to better understand the clinical characteristics, bed occupancy and outcomes of elderly patients admitted to a UK neurosurgical unit.

■ **METHODS:** Retrospective review of medical records of all patients aged 75 years and older admitted for at least 1 night to the Southwest Neurosurgery Centre from 2007 to 2010. Mortality data up to 31 December 2012 were obtained from a national registry.

■ **RESULTS:** Eight hundred and eighty-six elderly patients were admitted, for whom 877 records were available. Three hundred and eighty-nine patients were admitted electively; 488 were emergency or urgent; 48.8% had cranial pathology and 50.7% had spinal disease. Emergency cases were significantly older and more likely to be male than elective patients. The median length of stay for emergency patients was significantly longer than that of elective patients ( $P < 0.0001$ , 3 vs. 8 days). One elective patient died as an inpatient, compared with 46 emergency patients. Of emergency and elective patients, 25.6% and 3.6%, respectively, had died by 6 months after discharge. Age and length of stay were not associated with early death.

■ **CONCLUSIONS:** The demographics and outcomes of the elderly admitted to a UK neurosurgical center are discussed. Differences between elective and emergency groups are attributable to both the pathologic processes

and case selection. Neurosurgical treatment should not be denied based on age, however the high risks of emergency surgery in this age group should be acknowledged.

## INTRODUCTION

It is predicted that the number of people greater than 60 years of age will increase to 1.96 billion worldwide in 2050, from 0.6 billion in 2000.<sup>1,2</sup> The average life expectancy for those born in 2008–2010 in the United Kingdom is 78.1 years (males) and 82.1 years (females), with those aged 65 years old in 2008–2010 expected to live another 17.8 years (males) and 20.4 years (females).<sup>3</sup> The 2011 census showed that 1 in 6 (16%, 9.2 million) of the population is aged 65 and older. The population aged greater than 90 years has increased from 0.7% (336,000) in 2001 to 0.8% (429,000). These percentages are predicted to increase further as the baby boom age group approach retirement (Figure 1).<sup>4</sup>

The optimal management of elderly patients is an increasing concern in the neurosurgical community. The Congress of Neurological Surgeons in America dedicated the Summer Edition of their magazine to the topic,<sup>5</sup> and in 2012 the Royal College of Surgeons of England published “Access all ages: assessing the impact of age on access to surgical treatment.”<sup>6</sup> Recommendations include that age-appropriate information should be made available for older patients, and that surgical specialties should publish outcome data to show the benefits of treatment for older patients.

Evidence is needed to demonstrate whether neurosurgical intervention is worthwhile for elderly patients who may have a higher risk of postoperative morbidity and mortality, less

## Key words

- Aged
- Elderly
- Neurosurgery

## Abbreviation and Acronyms

**ASA:** American Society of Anesthesiologists  
**GCS:** Glasgow Coma Score  
**ITU:** Intensive treatment unit  
**LOS:** Length of stay  
**TBI:** Traumatic brain injury

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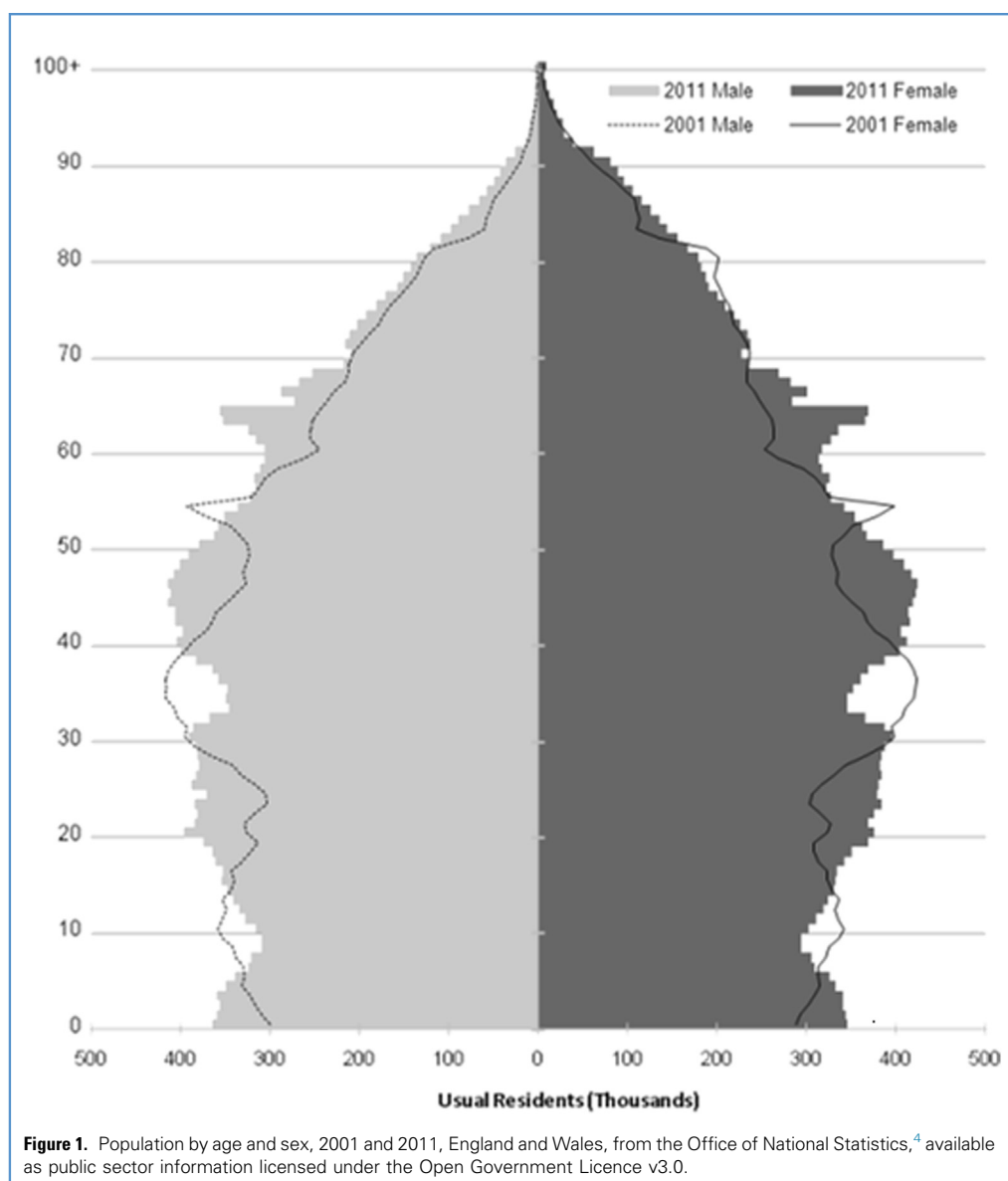
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physiologic reserve to recover, and a relatively shorter life expectancy that may not be best spent in hospital or receiving painful or even futile treatments. In addition, the economics of health care provision in this age group warrants scrutiny.

#### The Elderly in the South West of England

There are 1,035,000 people over 65 years in the south west of England, representing 19.6% of the local population, the highest percentage in the United Kingdom.<sup>7</sup>

The South West Neurosurgery Centre in Derriford Hospital, Plymouth, provides neurosurgical care for a population of approximately 340,000 people aged 75 years or older.<sup>7</sup> There has been an overall increased volume of admissions to the center over the past 13 years, but this has been disproportionately high

in the elderly. In 2000, of 1264 admissions, 13.26% were aged 75 years or older. In 2013, the number of admissions had nearly doubled to 2336, with 16.45% aged 75 years or older, an increase of 24% in this age group (Figure 2), representing a mean increase of 2.31% per year.

We retrospectively analyzed the demographic, clinical, and outcome data of patients aged 75 years and older admitted as elective or emergency patients to the South West Neurosurgery Centre. Our objectives were to evaluate the characteristics of the patients admitted, review the procedures undertaken, measure the length of hospital stay and use of intensive care resources, assess discharge destination, and patient outcomes. The assessment of the epidemiologic and management data, coupled with resource use and patient discharge destinations, will inform decision

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