

## BRIEF COMMUNICATION

**Audit of waiting time to theatre for non-obstetric emergency and urgent cases in Livingstone General Hospital, Zambia**

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**INTRODUCTION**

In 1985 the UK Confidential Enquiry into Perioperative Deaths (CEPOD) published a set of definitions to help describe the urgency of surgical procedures (Table 1).<sup>1</sup>

**Table 1.** *The NCEPOD classification of surgical procedures<sup>1</sup>*

**Emergency**

Immediate life-saving operation, resuscitation, simultaneous with surgical treatment (e.g. trauma, ruptured aortic aneurysm).

*Operation usually within one hour.*

**Urgent**

Operation as soon as possible after resuscitation (e.g. irreducible hernia, intussusception, oesophageal atresia, intestinal obstruction, major fractures).

*Operation within 24 hours.*

**Scheduled**

An early operation but not immediately life-saving (e.g. malignancy).

*Operation usually within three weeks.*

**Elective**

Operation at a time to suit both the patient and surgeon (e.g. cholecystectomy, joint replacement).

Livingstone General Hospital is a 300-bed secondary level hospital in Zambia. Long waiting times for surgery in urgent and emergency cases were perceived to be major problem in the hospital, but there was no documented evidence for this. An audit was conducted over a 12-month period to gather data on the waiting time for surgery for cases fulfilling the NCEPOD classification for urgent or emergency operation. The aim of the audit was to identify potential areas for improvement in the theatre service and provision of patient care.

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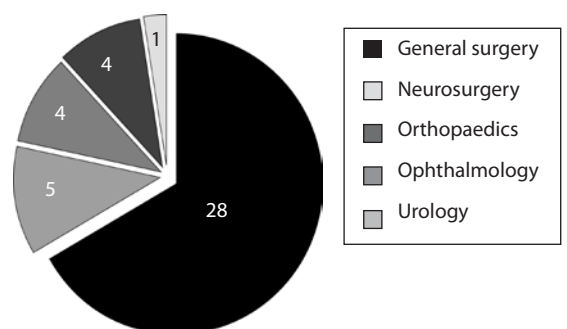
**MATERIALS AND METHODS**

A retrospective audit was performed of all non-obstetric urgent and emergency surgical cases at Livingstone General Hospital from March 2006 to February 2007. Using the patients' notes and the theatre operating book, data detailed age, sex, admitting medical specialty and diagnosis, date and time of admission, surgical diagnosis and operation performed. Outcome data were not collected. Cases were classified as urgent or emergency according to their surgical diagnosis. Waiting time was defined as the time from admission to hospital to the time of transfer to theatre. For urgent cases where the waiting time to theatre could not be determined precisely (ie. to the nearest hour), the time to theatre was estimated, rounded down to the nearest whole day.

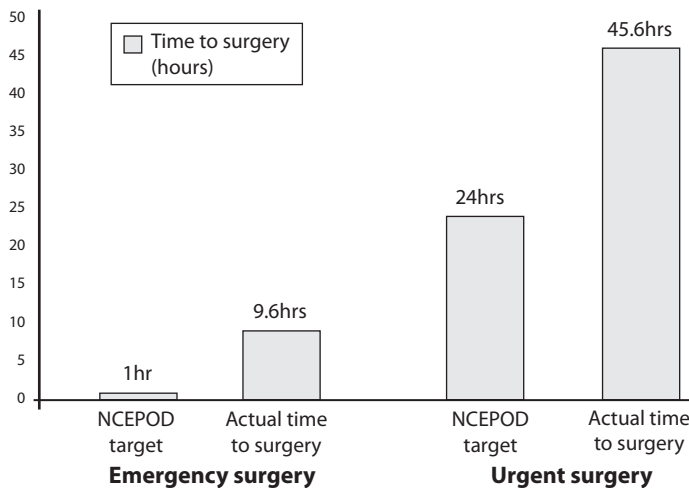
**RESULTS**

Incomplete or missing records were a major problem; only 42 out of a potential 78 cases provided sufficient data for analysis.

Of the 42 cases included in the audit the mean age was 28 years (range 3 – 75 years) and 70.5% were male. The most common diagnoses were intestinal obstruction (18%) and stab injury to the chest or abdomen (18%).



**Figure 1.** Breakdown of specialties of the 42 cases included in the audit



**Figure 2.** Median waiting time to theatre for patients requiring emergency and urgent surgery

The median waiting time for all cases was 1.3 days. Median waiting time for emergency surgery was 9.6 hours (range 1.8 - 17.8 hours) and for urgent cases was 1.9 days (46.6 hours) (range 6 hours - 38 days).

Of the 36 urgent cases, 15 (42%) had their surgery within the 24 hour target. The shortest waiting for urgent surgery was 6 hours (intestinal perforation), while the longest was 38 days (also intestinal obstruction).

Of the 6 emergency cases, none achieved the NCEPOD recommended waiting time for emergency surgery. The shortest time to surgery was 1.5 hours for three cases that were all stab wounds to the chest or abdomen. The longest wait for emergency surgery was 17.8 hours, also a stab wound.

Of note, five out of six patients with a diagnosis of simple appendicitis were subsequently found at operation to have a perforated appendix. These five patients had waiting times from admission to surgery of 6.5 hours, 24 hours, 24 hours, 40 hours and 31 days. There was only one patient with acute appendicitis who did not perforate; this patient waited 48 hours for surgery. Other cases of note are detailed in table 2.

## DISCUSSION

While accepting that the data collection was incomplete, this audit shows that patients booked for both urgent and emergency surgery at Livingstone General Hospital can expect

**Table 2.** Cases where surgery was delayed

Cases	Delay	Comments
11 year old female	31 days	Found to have a perforated appendix
37 year old male	30 days	Penetrating eye injury
31 year old male	18 days	Fractured femur
3 cases of intestinal obstruction	30 days	

a long delay before their surgery is performed. A minority of patients met the target waiting times set by the NCEPOD recommendations. The median waiting time for emergency cases exceeded the NCEPOD target by over ninefold and in the urgent group by almost twofold. The audit took no account of the time from onset of symptoms to the time to presentation at the hospital, but it is likely that this is significant for this poor rural community. Although outcome data was not collected, it is unlikely that prolonged waiting times for surgery after admission to hospital were of benefit to the patients. This is highlighted by the high proportion of patients with appendicitis who were found to have a perforation at laparotomy.

The poor quality of note-keeping hampered accurate estimation of times to surgery, and it was for this reason that time to surgery was estimated using the time from admission to hospital to arrival in theatre. Some patients may have had a delayed diagnosis and others, for example those with bowel obstruction, may have undergone a trial of non-surgical treatment prior to being listed for surgery. Reassuringly, only three patients of 42 had evidence that the surgical diagnosis was delayed after admission; these were three cases of intestinal obstruction where diagnosis was delayed by 14 hours, 4 days and 11 days respectively. Once the diagnosis had been made, each case only waited a further 1 hour 20 min, 5 hours and 5 hours respectively for their urgent surgery.

A major factor in surgical delays may be to be magnitude of the clinical workload combined with inadequate numbers of medical staff. Livingstone Hospital is a 300-bed hospital with 1 orthopaedic surgeon, 1 general surgeon, 1 obstetric and gynaecological surgeon and 3 house officers catering for the all the surgical specialties. An equivalent sized hospital in the United Kingdom would be expected to have far greater specialist and junior staffing levels to cater for the surgical workload.

It is well recognised that there are far fewer surgical procedures performed in developing world countries in comparison to wealthy countries, and that the majority of cases are obstetric or other emergency cases. This is likely to represent a gross under-provision of surgical services in these countries.<sup>2</sup> This audit demonstrates that even when surgery is available, there are significant delays for urgent and emergency cases that have an adverse effect on patient outcome. The next stage will be to analyse hospital processes to identify sources of delay. Surgical services need to be prioritised in this resource-limited environment to improve patient outcomes.

## REFERENCES

1. [www.ncepod.org.uk/pdf/NCEPODClassification.pdf](http://www.ncepod.org.uk/pdf/NCEPODClassification.pdf)
2. Weiser TG, Regenbogen SE, Thompson KD et al. An estimation of the global volume of surgery: a modelling strategy based on available data. *Lancet* 2008 June 24 (Epub ahead of print PMID: 18582931 Accessed 5th July 2008).