

# General surgery in Tonga: an audit

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## Introduction

Numerical definition of the work done by general surgeons in Tonga and other small islands of the Pacific has been scant. Much effort has been made to provide surgical training for this region and also short term specialty services, in particular through the Fiji School of Medicine and the Royal Australasian College of Surgeons. However, surgical services have tended to be interrupted by movement of doctors overseas and by retirement. In many cases operations are performed out of necessity by doctors who have no formal surgical training, and at times patients do not present because they know that resources are limited. Consequently, the surgical manpower requirements for small under-funded island nations can be very difficult to estimate. This paper endeavours to fill part of the information gap.

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## Patients and methods

This is a retrospective audit for the period mid-January to mid-October, 1998, with data taken from the operating theatre records and from a file kept for complications and deaths. Only major in-hospital complications affecting the authors' patients were recorded. Operations were all done at the Vaiola National Hospital, with the majority of cases being done by the authors. The data reflects virtually all the major surgery for the population of 100 000 but does not

include operations performed on outer islands, such as appendicectomy, fracture manipulation, and minor surgery for trauma and infection. Also, the areas of ophthalmology, obstetrics / gynaecology, and ENT are not included in the figures.

## Results

Over a nine month period in 1998, 770 general surgical operations were performed at the Vaiola National Hospital, Tonga. A breakdown of the types of operations performed is presented along with comments regarding morbidity and mortality. This paper provides some data relevant to the surgical needs of the Tongan population of 100 000 people and may be of use in health care planning. See Table 1.

**Morbidity.** Two patients had an unplanned return to the operating theatre. One was to drain a subphrenic abscess which complicated an extended right hemicolectomy, and the other was to control re-bleeding after partial gastrectomy for a giant penetrating duodenal ulcer. Both recovered well. One patient developed a deep venous thrombosis following closed reduction of a dislocated hip. Deformity and poor function following treatment of osteomyelitis and fractures, due to late presentation rather than inadequate treatment, were not uncommon.

**Mortality.** There were 6 post-operative deaths and 4 deaths in patients who did not have surgery.

### Adults

1. 52 years old (yo) male. Multiple medical problems. Laparotomy for perforated gastric ulcer. Post-operative respiratory and renal dysfunction. Refused further treatment.
2. 34 yo female. Laparotomy for diffuse intra-abdominal haemorrhage from widespread undifferentiated malignancy.
3. 68 yo diabetic female. Myocardial infarct after below-knee amputation.

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Table 1. Audit of operations at Vaiola National Hospital, Tonga. Jan - Oct 1998

Operations	Including	Totals
<b>General - Major</b>		
Abdominal	Gastrectomy, colectomy, splenectomy, cholecystectomy, other various laparotomies	32
Other	Incl. Mastectomy, thyroidectomy, other	11
		<b>43</b>
<b>Urology</b>		
Kidney	Nephrectomy, pyelolithotomy, abscess	4
Bladder	Partial cystectomy, fistula	2
Prostate	Prostatectomy, stricture	5
Minor	Cystoscopy, prostate biopsy, varicocele, vasectomy	8
		<b>19</b>
<b>Paediatric* surgery</b>		
Abdominal emergency	Perf'd appendix / Meckel's exomphalos, colostomy, pyloroplasty, intussusception, other	11
Inguino-scrotal		18
Other	Cystic hygroma, soft tissue tumour, skin graft	3
		<b>32</b>
<b>Major orthopaedic</b>		
Major amputation		13
Major nerve repair		6
Internal fixation of fracture	Plate/nail	4
Extensive compound scrub		17
Other	Hand surgery, explore joint, other	6
		<b>46</b>
<b>Endoscopy</b>		
Upper endoscopy		48
Colonoscopy		4
Laparoscopy		4
		<b>56</b>
<b>Intermediate</b>	Appendicectomy, herniae, hydrocele, breast lump, etc	<b>111</b>
<b>Minor operations</b>	Manipulation of fracture, minor amputation/debridement, suture laceration, remove foreign body, excise lump/lesion, skin graft, drain abscess, wedge resection of toenail, etc	<b>463</b>
<b>TOTAL</b>		<b>770</b>
<b>Visiting teams</b>		
Urology	Prostatectomy, open/endoscopic, other	10
Orthopaedic	20 club feet, other major	23

\* Does not include orthopaedics, lacerations, etc. Ages from 1 day to 9 years old (median 3 years).

### Paediatric

1. 1 day old. Laparotomy for exomphalos. Hypovolaemic arrest at 12 hours post-operation due to inadequate fluid replacement. Surgeon informed too late.
2. 5 month old. Laparotomy to reduce ileocolorectal intussusception. Hyperkalaemic cardiac arrest at 12 hours due to inappropriate supplementation.
3. 7 month old. Colostomy for Hirschprung's disease with megacolon. Malnutrition and recurrent enterocolitis. Died of unexplained sepsis (negative laparotomy).

### Non-operative

1. 60 yo diabetic male. Refused amputation of gangrenous leg.
2. 23 yo male. Family refused to allow surgery for extensive ischiorectal abscess.
- 3 & 4. Advanced breast cancer.

### Discussion

**Workload.** Over 20 procedures per week were performed and this number would be higher if it included operations done on outer islands and patients who are currently treated by traditional medicine but in future may present to the hospital. A substantial number of paediatric, urological and orthopaedic problems are seen. A surgeon working in this region needs to have some subspecialty interest in these areas and also should have endoscopic skills.

**Morbidity and Mortality.** The main concern relates to the deaths which may well have been preventable. Two of the paediatric deaths were due to fluid and electrolyte problems, with the third largely due to delayed surgical treatment. Pre- and post-operative input from an experienced paediatric physician may have resulted in a different outcome. Another area of concern relates to patients who

decline surgical treatment as in the first two non-operative deaths mentioned. As public awareness and understanding of modern medicine improves this should happen less.

Routine prophylaxis against thrombo-embolic complications was not used on the grounds that pulmonary embolus and deep venous thrombosis have been extremely unusual in Tongans post-operatively. The authors only used prophylaxis for high risk patients. In fact, other chest complications such as atelectasis and pneumonia were also clinically insignificant. This has been attributed to the high pain threshold of most Tongans, resulting in minimal narcotic requirements and early post-operative mobilization.

Overall, morbidity and mortality are not excessive, and this demonstrates that reasonable standards are able to be achieved in this setting.

### Conclusion

For a population of 100 000 people in the Pacific region, a surgical team can expect to perform well over 20 operations per week. The team should consist of at least two trained surgeons who between them have subspecialty

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interest in paediatric, orthopaedic and urological surgery. They should preferably be supported by two other doctors, one of whom can be a junior doctor perhaps on rotation and the other could be a GP (non-specialist) surgeon who can perform less complex procedures and participate in on-call activities.

Forward planning and "reserve capacity" is advised to allow for retirement, leave and unexpected loss of staff through emigration or sickness.

### References

*Available from author on request.*

The greatest triumph of surgery today ... lies in finding ways for avoiding surgery.

R.T. Morris in *Doctors vs Folks*