



Pre-operative categorization (triaging) of emergency surgical cases

A tool for improving patient care and emergency
operating room efficiency

Introduction

- No national or provincial guidelines exist for the categorization or triaging of emergency surgical cases.
- In the current climate of shrinking elective operating time and increasing surgical waiting times, the present focus of health planners is to decrease elective waiting times by establishing initiatives aimed at improving overall theatre efficiency.
- Emergency surgical case loads form a significant and increasing percentage (average 5-7% annually) of all patients utilizing theatre facilities.

Why is elective surgery different from emergency surgery?

- Planned (patient, hospital, surgical/anaesthetic team). Length of surgery, hospital stay and morbidity and mortality can be predicted or inferred
- One surgical team has exclusive access to a pre-determined number of operating hours
- Occurs during “in hours” when infrastructural support is at maximum
- Inefficiencies on any one slate are relatively static and thus (potentially) easily addressed

Definition of an emergency surgical case



Unplanned and
unscheduled manner.

Acute surgical
conditions

Prompt and focused

Minimize morbidity and
mortality

A bit of history.....

Prior to 1992 only after hours emergency theatre

Emergency cases

“crashed” elective lists

After 1992: With increasing burden of emergency cases, each surgical discipline gives up session to man 24 hour emergency theatre

Increasing attrition of elective lists (66% decrease in elective slates since 1992)

“loading” emergency lists with many non-urgent (but not purely elective) cases



Something has to give.....



Do something!!!



Emergency Theatre Utilization Audit

- Carried out over 91 days from the second week of May 2006
- Only cases booked on the emergency board audited
- 915 cases booked on emergency board during audit period
- 57 cases removed from the board and not re-booked
- A total of **858** cases booked on the emergency list were done during the audit period, but only **657** questionnaires were filled in giving a return rate of **77%**

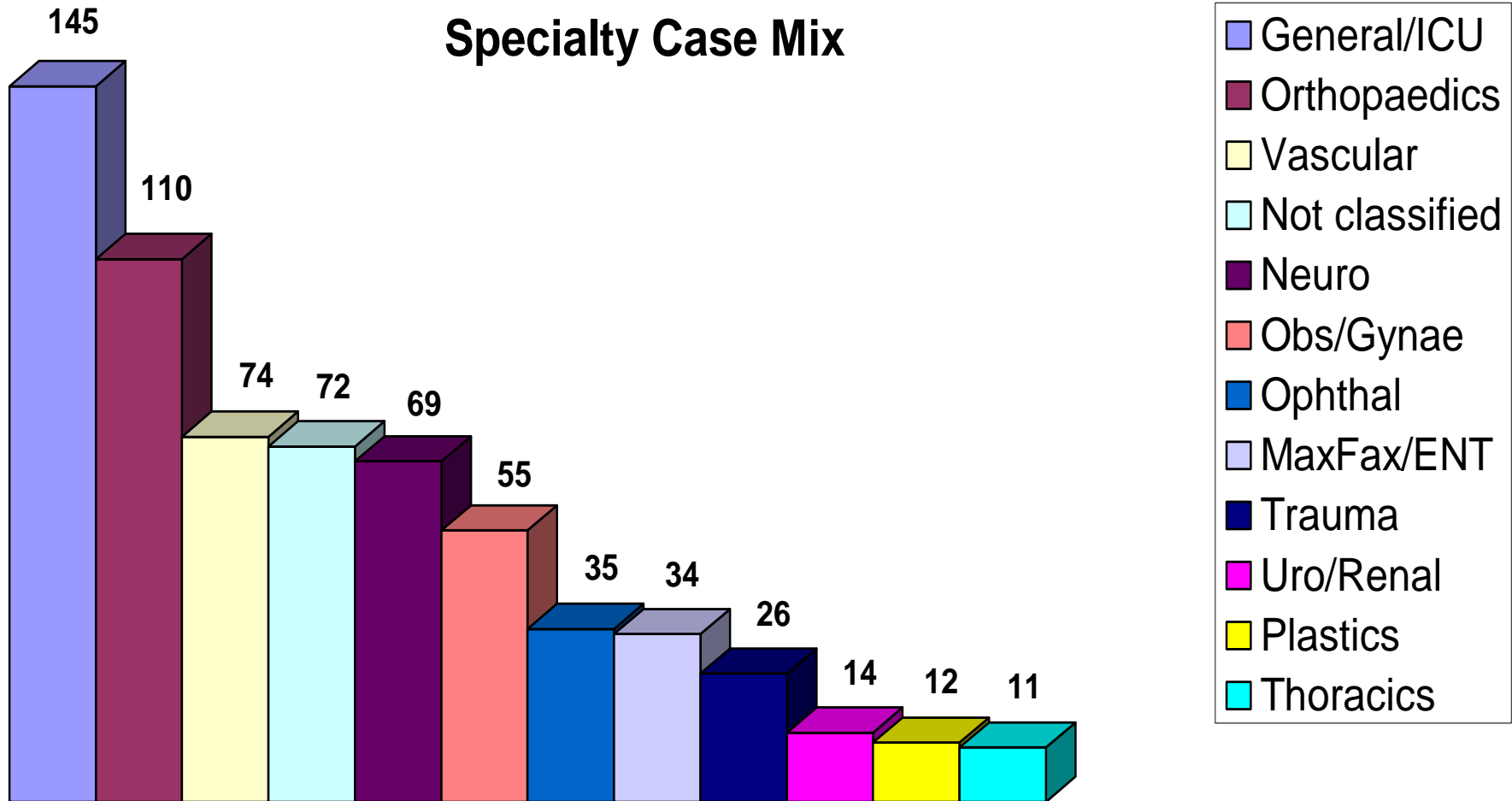
Emergency Theatre Case Audit Form

Patient Sticker

Theatre:
D:

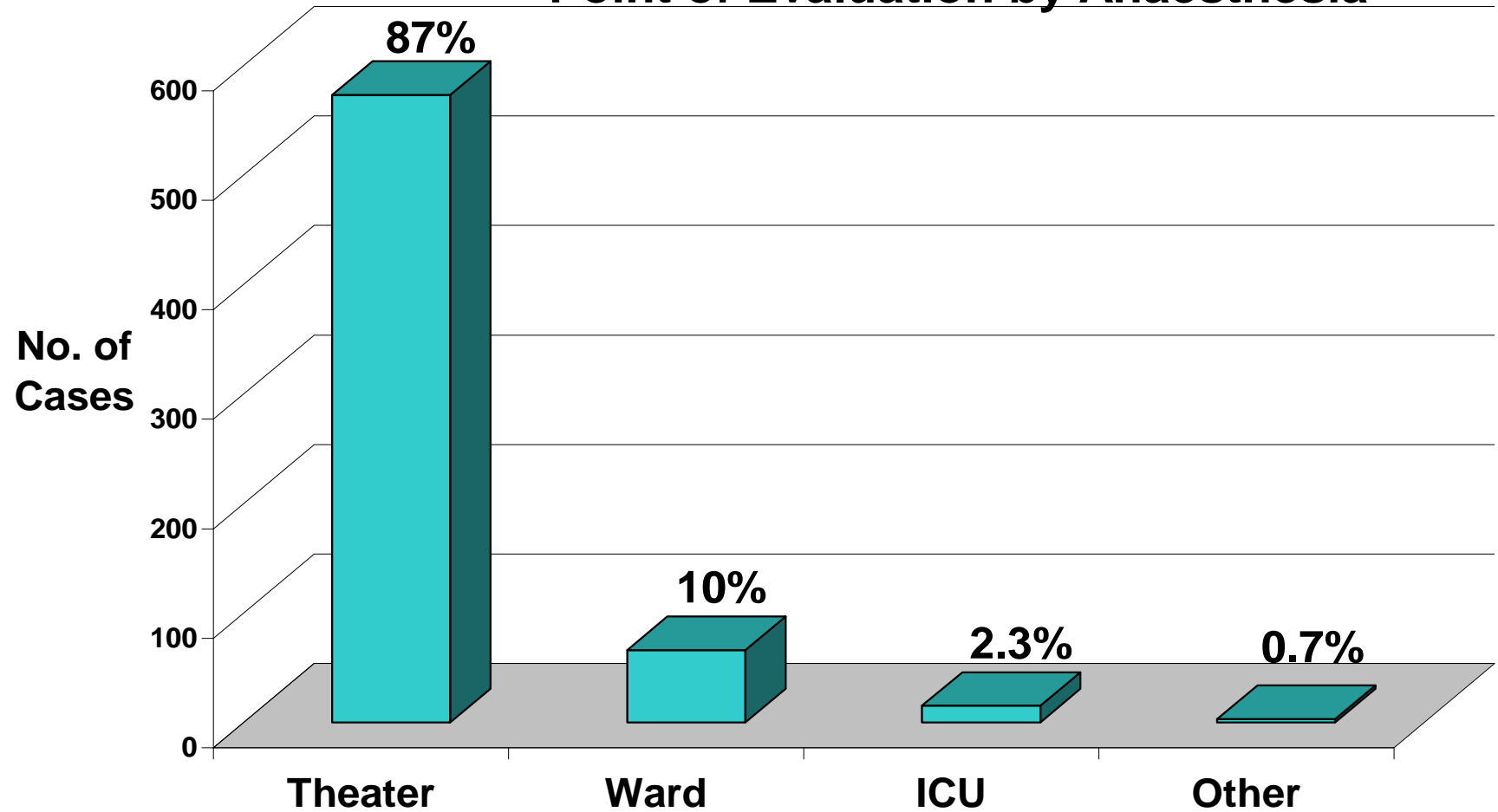
1. Procedure booked:
2. Date and time case booked:
3. Patient evaluation by anaesthetist: on arrival in theatre in ward
4. Was patient ready for theatre when evaluated? YES NO
5. If not, state why:
6. Patient's ASA grade: I II III IV V
7. Date and time Patient sent for:
8. Time patient arrived in induction room:
9. Was surgeon available when required: YES NO
10. If not, state why:
11. Anaesthesia time: From: To: ; GA regional both
12. Surgical time: From: To:
13. Grade of surgeon performing operation: registrar consultant
14. Grade of anaesthetist responsible: jun. reg. sen. reg. consult.
15. Procedure: performed postponed cancelled abandoned
16. If case not performed state reason/s:

Specialty Case Mix

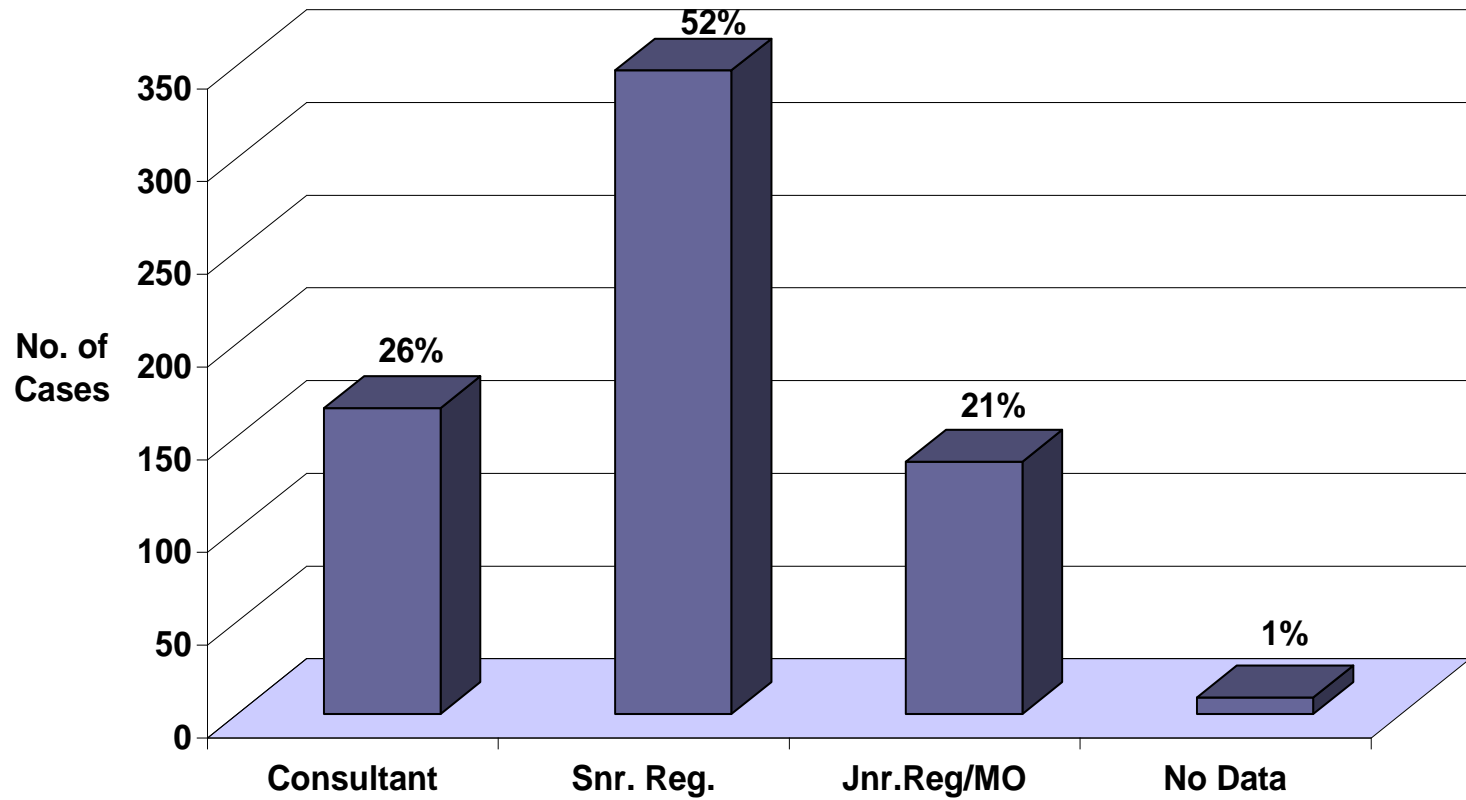


Emergency theatre audit 2006

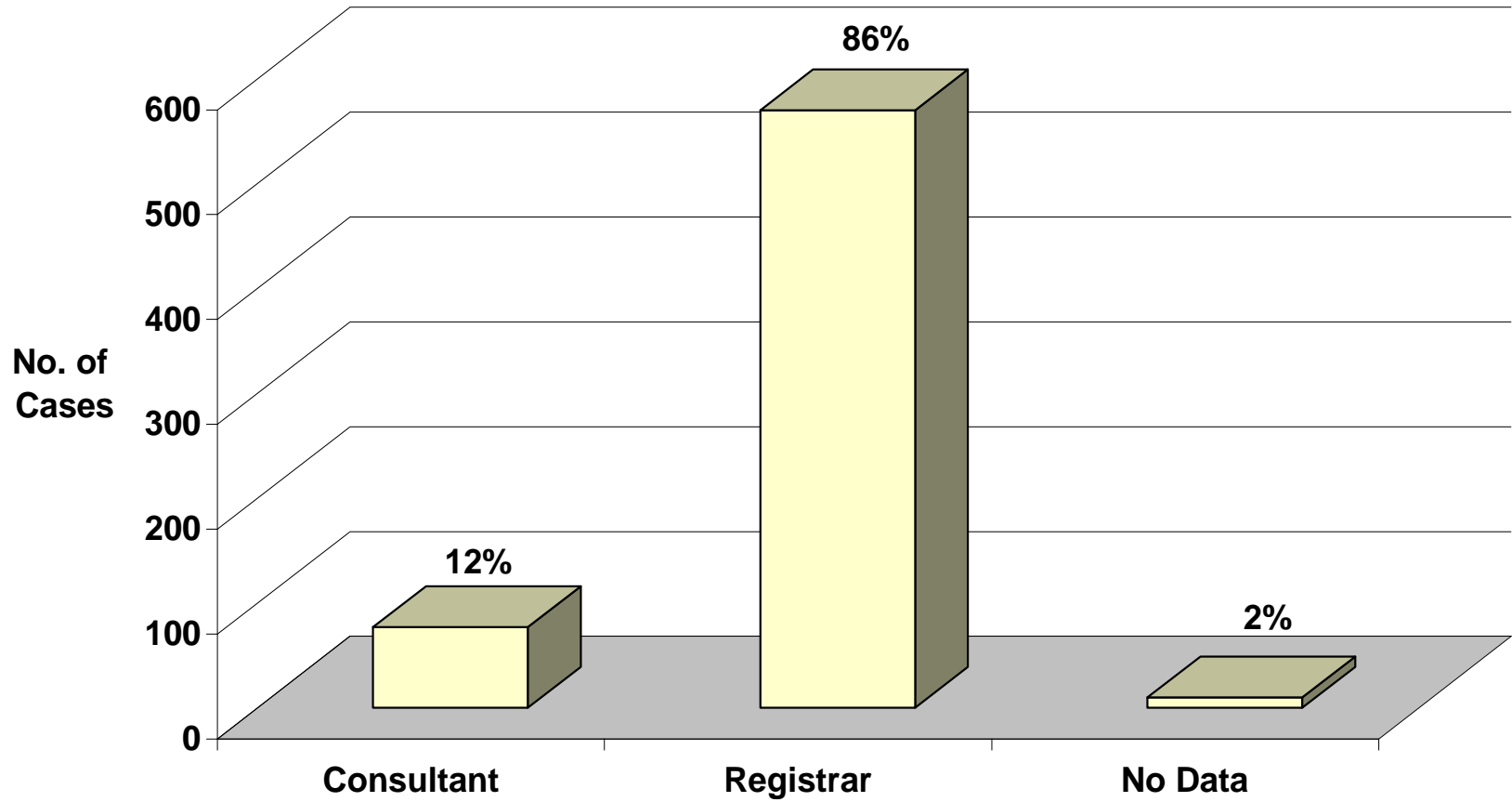
Point of Evaluation by Anaesthesia



Grade of Anaesthesia Staff



Grade of Surgical Staff Operating



Audit recommendations

- Dedicated, protected nursing team for emergency theatre
- Establishment of urgent theatre to deal with increasing number of less urgent cases
- Establishment of a Post Anaesthesia High Care Unit
- *More active participation of on call team in the pre-operative assessment of cases booked on the emergency slate*

Who will be responsible for assessment?



Triage registrar



- Senior registrar in cardiac rotation
- Evaluates ALL cases booked on the emergency board and consults with surgical team regarding optimisation strategy, if required.
- Link between emergency anaesthetic team and surgical team
- Dedicated to triage only, Monday to Friday

Emergency Case Evaluation Form

Patient sticker

Admission date: _____ Time: _____
 Ward: _____ Surgical specialty/Firm: _____
 Date and time of booking: _____
 Initial categorization: R O Y G B (circle one)
 Date and time of surgery: _____

Surgical procedure:

Medical/surgical history:

Risk assessment: ASA: _____ NYHA: _____ METS: _____

Previous anaesthetic complications:

Drug therapy:

Drug allergy:

General examination:

Wt: _____

BMI: _____

Cardiovascular:

Pulses: _____

BP: _____

JVP: _____

H S: _____

Murmurs:

Respiratory/airway:

Mallampati: _____

AO-ROM: _____

good

restricted

ThMD: _____

adequate

inadequate

Other systems:

Investigations

Hb : _____ Na⁺: _____ pH: _____
 Plts : _____ K⁺: _____ pCO₂: _____
 INR: _____ Urea: _____ pO₂: _____
 Glucose: _____ Creat: _____ HCO₃: _____
 Albumin: _____ GFR: _____ BE: _____

CXR

ECG

Other:

Recommendations:

Additional investigations:

Group &Screen: _____

X-match: _____

Units

Please refer patient to _____ for consultation prior to planned procedure.

Evaluated by: _____ Time: _____ Date: _____ Speed dial: _____ Bleep: _____

- Carbonated pad
- Hard copy remains in patient's folder

What about the surgeons?



Why triage emergency surgical cases?



Decreases waiting times for sickest patients

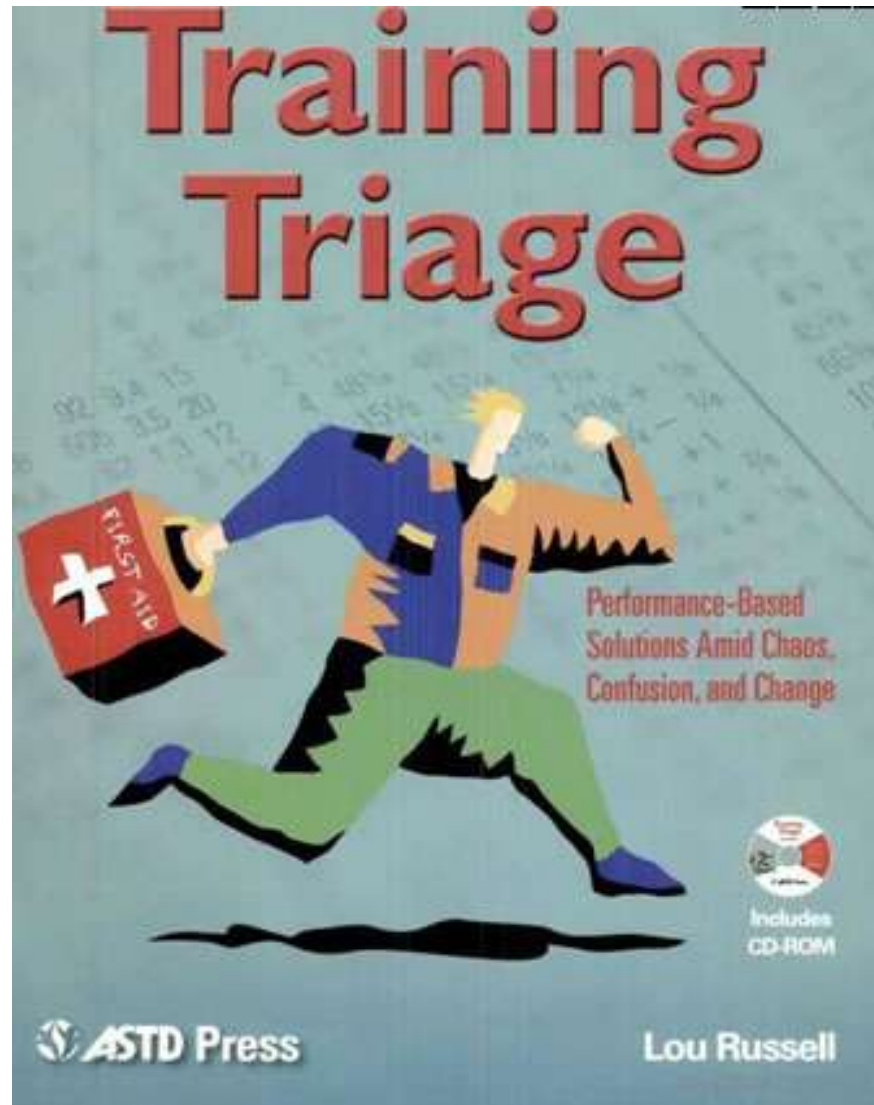
Improves management of clinical risk

Decreases morbidity and mortality

Promotes appropriate use of scarce resources

Audit

Which triage tool....?



Principles are to identify...

- The walking wounded
- Patients that need immediate help/evacuation and have good chance of survival/recovery
- Patients that are likely to die despite treatment
- The dead

... by using scoring systems based on physical/physiological parameters, and prioritise actions and resources towards those most likely to benefit.



The Cape Triage Score – a triage system for South Africa

L A Wallis, S B Gottschalk, D Wood, S Braijns, S de Vries, C Balfour, on behalf of the Cape Triage Group

The Cape Triage Score (CTS) has been derived by the Cape Triage Group (CTG) for use in emergency units throughout South Africa. It can also be used in the pre-hospital setting, although it is not designed for mass casualty situations. The CTS comprises a physiologically based scoring system and a list of discriminators, designed to triage patients into one of

five priority groups for medical attention. Three versions have been developed, for adults, children and infants. As part of the ongoing assessment process the CTG would value feedback from the readers of this *Journal*.

S Afr Med J 2006; 96: 53-56.

The need to prioritise the care of South African patients in both the pre-hospital and emergency unit (EU) setting is obvious. Such prioritisation is termed triage – the process of sorting patients according to medical need. As there is no nationally accepted triage system in South Africa, the need to design and implement such a system was identified.

Many international triage systems exist, but none of these systems are appropriate for use in South Africa. In-hospital triage systems include the Manchester Triage,¹ the Canadian Triage Assessment Scale (CTAS)² and the Australian Triage Score (ATS).³ Implementation of each of these triage tools requires extensive training, making their widespread adoption in South Africa problematic. Furthermore, the time taken to triage each patient exceeds requirements for the South African

The Cape Triage Group (CTG) was convened in April 2004 by the Joint Emergency Medicine Division, Universities of Cape Town and Stellenbosch, in order to design a triage system suitable for local use. The CTG is multidisciplinary and comprises doctors, nurses and paramedics representing the state and private sectors. The CTG set goals that included defining vital sign parameters, while ensuring that the triage system remained user-friendly in order to enable rapid and accurate sorting of emergency patients.

Current triage systems in South Africa

In-hospital (i.e. EU/trauma unit) triage is practised by a minority of units, although this is inconsistent as no national triage system is in place. The pre-hospital use of triage in South

- The Cape Triaging Score (CTS) was developed by the Cape Triage Group¹
- Introduced for use in emergency units throughout the country as well as in the pre-hospital setting.
- Has three versions: Adult, children, infant
- Uses a physiologically based scoring system (Triage Early Warning Score- TEWS) and certain discriminators (mechanism of injury, presentation, pain and discretion of senior health care professional responsible) that categorizes patients into one of five priority groups for medical attention.

Colour

Status



Red

Immediate priority (resuscitation cases)

Orange

Very urgent priority- potentially life/limb threatening pathology

Yellow

Urgent priority- significant pathology

Green

Delayed priority – minor injury/illness

Blue

Dead

Why not extend categorization beyond the ER?



Emergency case categorization chart

- The emergency surgical case categorization chart (ESCCC) is based on similar principles to the CTS. It has identical colour coded categories which define different levels of surgical acuity and gravity and suggests timing and urgency for operative intervention.

Icon	Case Category	Parameters
Red	Immediate	Immediate life saving operation, resuscitation simultaneous with surgical treatment e.g. resuscitative laparotomy, ruptured aortic aneurysm, threatened airway, cord prolapse, foetal bradycardia
Orange	Hot emergency	Operation as soon as possible after resuscitation (within 1 to 2 hours) - e.g. ruptured ectopic pregnancy, leaking aortic aneurysm, cranial decompression, positive DPL in multiple trauma, threatened limb
Yellow	Cold emergency	Operation within 6 hours of booking e.g. compound fractures, appendicitis, incarcerated hernia/intestinal obstruction, EUA for non-accidental injuries
Green	Urgent	Operation not immediately life or limb saving but to be done within 24 hours of booking e.g. ORIF of simple fractures, bleeding haemorrhoids, I&D abscess
Blue	Scheduled	Semi-urgent cases, to be done within 72 hours. Operation during in-hours on next available slate if possible

Management of system

- Blue cases become Green after 72 hours
- Green cases become yellow after 24 hours
- Yellow cases become orange after 6 hours
- Orange cases become red after 2 hours
- Booked cases must be assessed on an ongoing basis and re-categorized as required
- The surgical team admitting a patient is responsible for the initial categorization of the case
- The anaesthetic team should be intimately involved in the triaging/categorization of cases with their surgical colleagues
- Arbitration between surgeons with similarly categorized patients regarding priority on emergency list to be decided by institution

What are the expected outcomes?

- Better communication and cohesion between emergency team
- Improved patient care (lower morbidity and mortality)
- Better use of scarce emergency theatre time
- Appropriate use of resources
- Patient satisfaction

Status 2009

- Urgent theatre one day per week (October 2008)
- Introduction of “triage” anaesthetic registrar (June 2009)
- Obligatory categorization of emergency cases by surgeon utilizing emergency case categorization chart (July 2009)

- Triage registrar a great success
- Categorization by surgeons patchy
- Manual color coding by theatre staff inconsistent

Where to from here?

- Computerize display of booking board to include automatic color coding of patients
- Computerize all input of data from emergency theatre currently entered in theatre registers etc



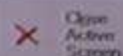
NO.	NAME	STATUS	ROOM	ADMIT	CHARGE
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Prof...

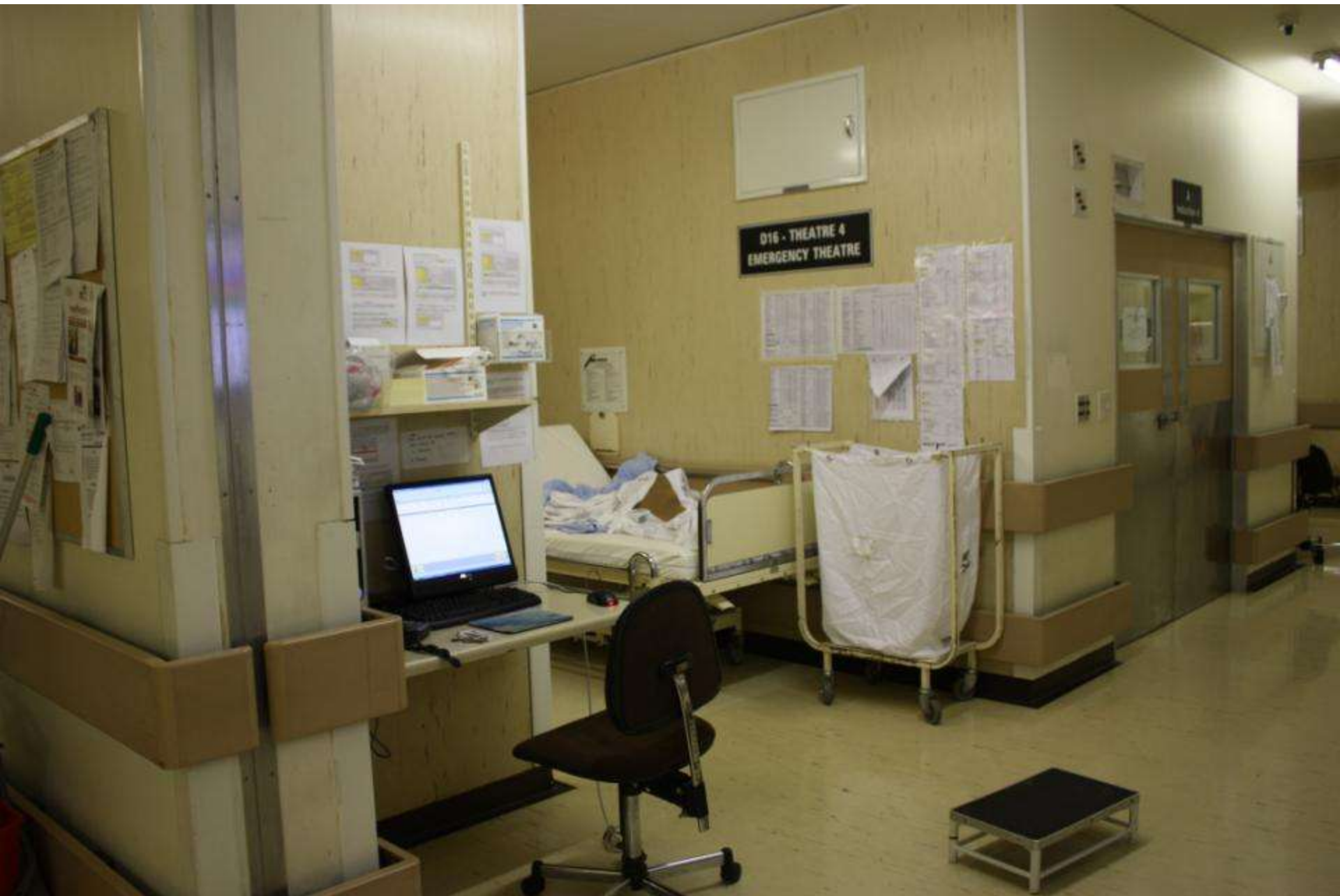
Falanga 76402

SR: ERNST 76467

Req 2: ABASS 76429



On	Date	Time	Folder No	Name	Procedure Booked	Ward	Surgeon	Speciality
	19/07	8:48	63298640	J Pringle	Closure Of Sheath	G8	Falayiye 76601	Surgery
	19/07	10:41	113588420	M. Sam	Exp. Right Wrist And Tendon And Nerve	F22	Vd Horst 76716	Hands
	19/07	13:27	111245882	T Jonas	Right Fem Pop Bypass	F16	Hampton 76636	Vascular
	19/07	14:36	59557488	G Jaffer	Laparotomy For Appendix	F25	Falayiye 76601	Surgery
DONE	20/07	7:24	2832304	Thomas Carter	Exploration Right Neck	F8	Dalela 76725	ENT
IIIb	20/07	7:58	67985440	M Sylvester	Relook Lap	F17	Murughan 76948	Surgery
	20/07	8:05	113192827	N Sondlono	Relook Right Ankle +/-SSG	F22	Flemming 77164	Ortho
III4	20/07	8:07	16910085	M Zandberg	RI Groin Exploration/On Table Angio/Er	F16	Natha 76076	Vascular
	20/07	9:18	104430017	D Stokes	Formalin Installation Of Bladder	F4	Vd Heever 76534	Urology
	20/07	9:22	68649458	M Hoorn	Relook+Closure Fasciotomy Lt Tib+Fib	F22	White 76183	Ortho
	20/07	9:25	37216967	T Ntshweza	Lt Dhs	C14	Dachs 76730	Ortho
	20/07	10:45	61577656	M JACOBS	Lt Moores Prosthesis	F23	White 76183	Ortho



Person Logged In:

Admin

Record Entered By:

Theate

N Sondlano

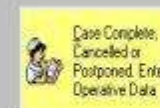
Update Screen



Patient Number	On	First Name	Surname	Gender	Age	Ward	Folder Number	Surgeon	Procedure Booked	Case Status
1.255		N	Sondlano	Not Known	0	F22	113133327	McCullum 76077	W/D Vac R Ankle	
1.254		Emergency	April	Not Known	0	D4	113430334	Khunalo 76618	Left Evicercation	
1.253		A	Ahmed	Male	0	C14	113420426	Dilela 76725	Tracheostomy	
1.252	SF5	G	Majjala	Male	0	C14	82182429	Dilela 76725	Tracheostomy	
1.251		Trevor	Tatani	Male	0	C27	79440954	Dilela 76725	Trache	
1.250		Mr	Moko	Male	0	C14	47683875	Koller	Washout Of Right Hand	
1.249	SF4	N	Nyeki	Female	0	F12	113303606	Kennedy 76964	Expl. Lap 4 PID	
1.248		E	Gordon	Female	0	C5	62351309	Slabbert 76627	Change Of Vac Dressing	
1.247		S	Simons	Not Known	0	C14	89118202	Koller	Tendon Repair RightHand	
1.246	BREAKFA/R		Murphy	Male	55	F16	83524546	Wicht 76983	Debridement Septic Groin	
1.245	DONE4	A	Quonini	Male	0	Pacu-F16	112158423	Wicht 76983	Left Aka	Completed
1.244	DONE4	B	Arnolds	Female	0	F16	84912849	Sweat 76819	Facial Abcess,Submental	Completed
1.243	HEMOPH	W	Pensar	Male	0	F22	81198608	McCullum 76077	Mus Grit Tibia	
1.242		H	Emerg July 08	Male	0	C14	113420707	McCullum 76077	DRIF Ultra K Wires Right Hand	
1.241		Ms	Mpinda	Female	0	F12	46571535	Musa 77008	Evac	Cancelled
1.240		B	Fredricks	Not Known	0	C12	113156301	Held 77086	Right Humeral Nail	Cancelled
1.239	DN4	N	Letsika		26	G17	20580314	Koshy 76546	Pericardial Window	Completed
1.238	DONE4	K	Dauids		0	F17	55702963	Nande 76695	Eua.Sphinterotomy	Completed
1.237	DN10	C	Campher		0	F22	75247494	White 76183	Dif Rt Ankle	Completed
1.236		V	Hayens		0	F17	41694712	Nande 76695	Laparoscopy,Loop Colostomy,Rectal Biopsy	
1.235	DONE	N	Mpayiphele		0	D24	13518535	Koshy 76546	Bobdl+Biopsy	Completed
1.234	SF9	Mrs	Patu	Female	0	F22	67751745	McCullum 76077	Washout Rt Tibia+_ Skingalt	
1.233	5TH	Mrs	Fortun		0	F23	112874938	McCullum 76077	Reblock Lt Tibia	
1.232	DONE9	U	Allies		0	F23	4008865	Du Plessis JP 76591	Rt Femoral Nail	Completed
1.231	DONE5	S	Palmer	Male	0	F26	66772476	Moodley 76760	Secondary Closure Of Chin Wound	Completed
1.230	DN5	G	Rhoda	Male	0	F26	33464025	Moodley 76760	H Mandible	Completed
1.229	DN9	M	Mbokobwana	Male	63	F22	113041313	McCullum 76077	Dif Rt Tibial Plateau-Peolock Set	
1.228		L	Mienzana	Male	31	F22	56740442	McCullum 76077	Reblock+Skimgalt U Arm	
1.227	DONE	A	Kamfer	Female	17	F23	77878742	Stander 77018	Dif Rt Radius	Completed
1.226	D16 TH4	S	Khunalo	Not Known	0	F8	20669842	Nyanasebru 76723	Incision And Drainage +Sinus Washout	Completed
1.225		M	Mochekete	Female	0	F23	63811685	Held 77086	Dif Rt Foream	Cancelled
1.224		M	Mochekete	Female	0	F23	63811685	McCullum 76077	Dif R Foream	
1.223		A	Petersen	Female	0	C15-F25	43441930	Knowles 76584	Appendix	Completed



Book New Case



Case Complete, Cancelled or Postponed, Enter Operative Data



Procedures and Surgical Notes



Delete Highlighted Patient



View Active Screen

Booking and Categorisation Information


First Name:
 Surname:
 Folder Number:
 Ward:
 Gender: ▾
 Age:
 Hospital Name:

Surgeon / Contact No: ▾
 Speciality: ▾
 Procedure Booked:

Categorisation and ReCategorisation Info


Categorisation	Booked Date	Booked Time	Date Due	Due Time	Highlighted Categorisation Complete?
Green	9/07/2010	12:47	10/07/2010	12:47	

 Delete Incorrect Categorisation

 Reason For Recategorising
 (Complete Before Recategorising)

 Insert a New Categorisation or
 Recategorise

Theatre Location:

 Save
 Patient Info

 Cancel

Times and Surgical Team (Nurses)Case status: (Postponed, Cancelled or Completed will remove record from Large Active Screen)Date Postponed, Cancelled or Completed: Time Postponed, Cancelled or Completed: (24Hr)Reason Postponed or Cancelled: **Anaesthetic Type**General Regional Local Sedation Anaesthetic Start Time: (24Hr)Anaesthetic End Time: (24Hr)

Duration Of Anaesthetic (hh:mm): 1:20

Operation Start Time: (24Hr)Operation End Time: (24Hr)

Duration Of Operation (hh:mm): 1:05

SURGICAL TEAMScrub Nurse: Surgeon: Anaesthetist: Assistant Surgeon: Assistant Anaesthetist:  Accept Cancel

Procedures and Surgical Notes (Surgeons)

PROCEDURES PERFORMED

Classification	Sub Classification	Surgical Procedure	Code
Digestive System	Abdominal region, other procedure	other repair of peritoneum	54.73
Digestive System	Abdominal region, other procedure	laparotomy	54.1

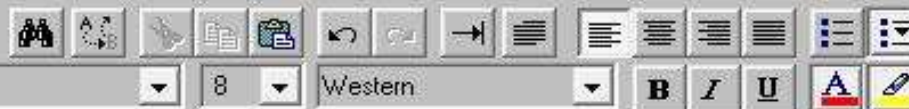


Remove This Procedure



Add Procedures

SURGICAL NOTES



MS Sans Serif

8

Western

B*I*U

Midline incision bruising of caecum noted. Closed in two layers.

Select if Case Entry is Complete. Will be removed and archived.



Accept



Cancel

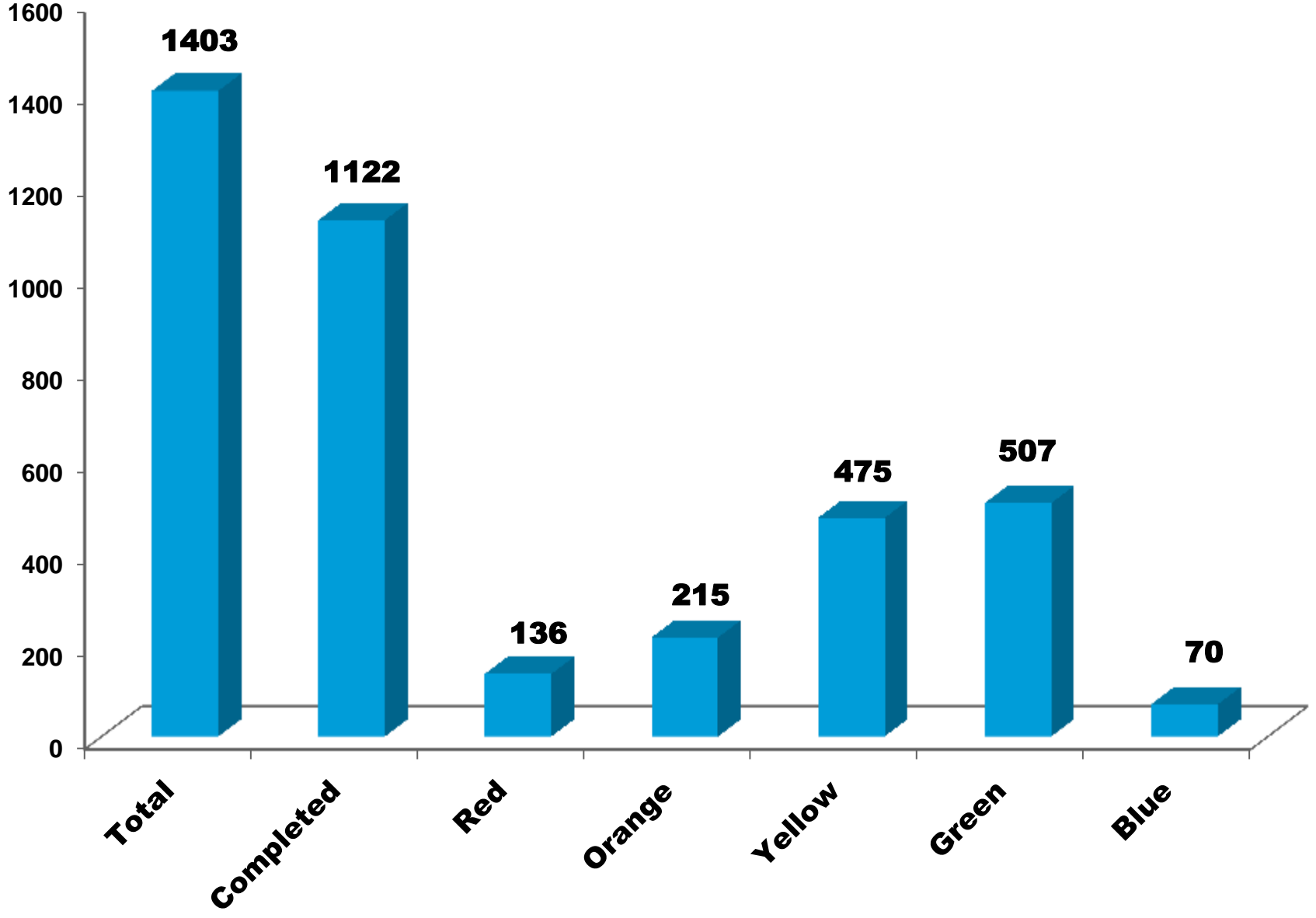
- The electronic triage system (SurgiBank) has been enthusiastically embraced by nursing staff and anaesthetists despite early problems with program gremlins.

So far our surgical colleagues.....

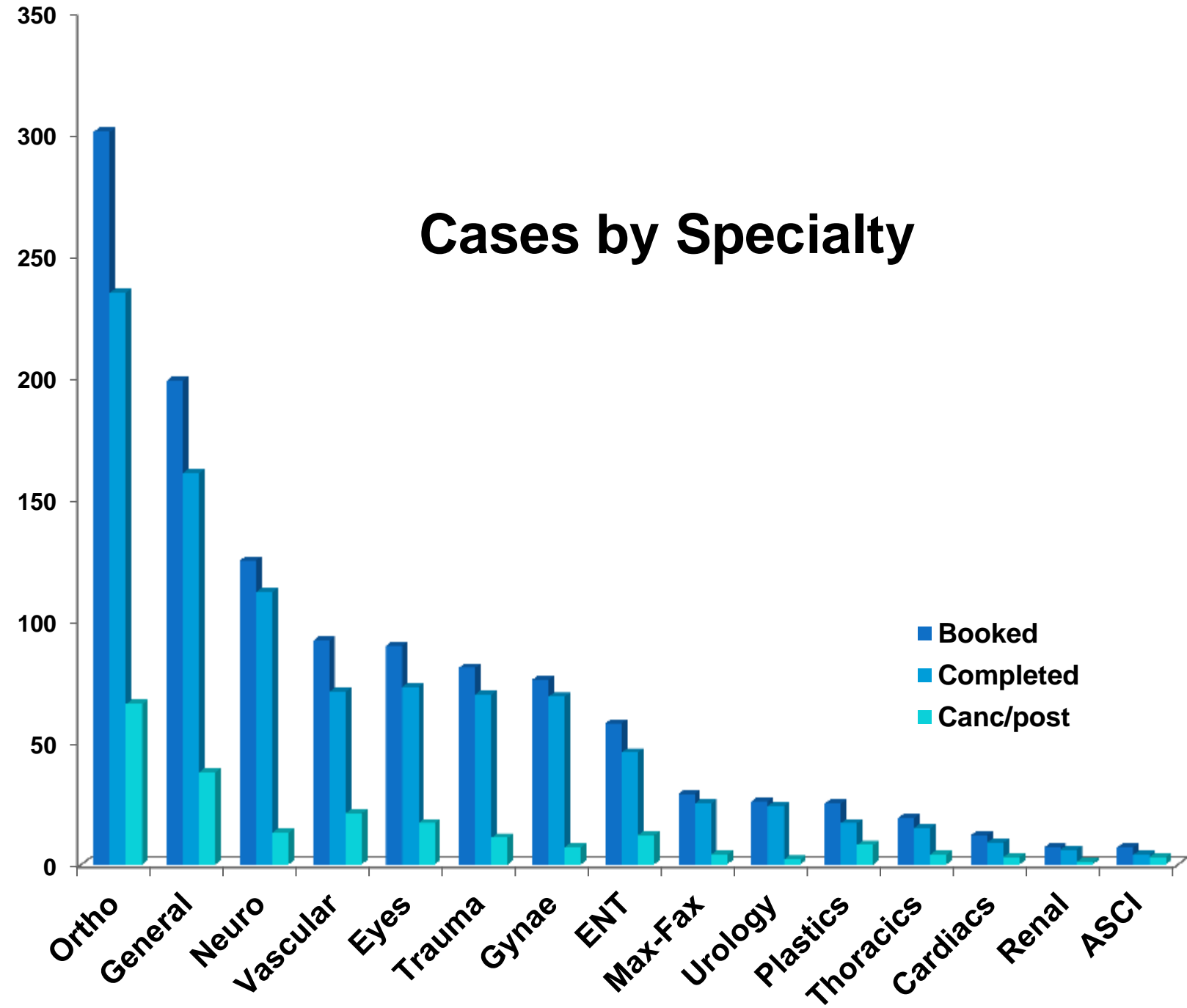


..... have generally been very positive, but there remain issues with compliance, particularly as regards the appropriate colour coding of patients and the entering of surgery specific data.

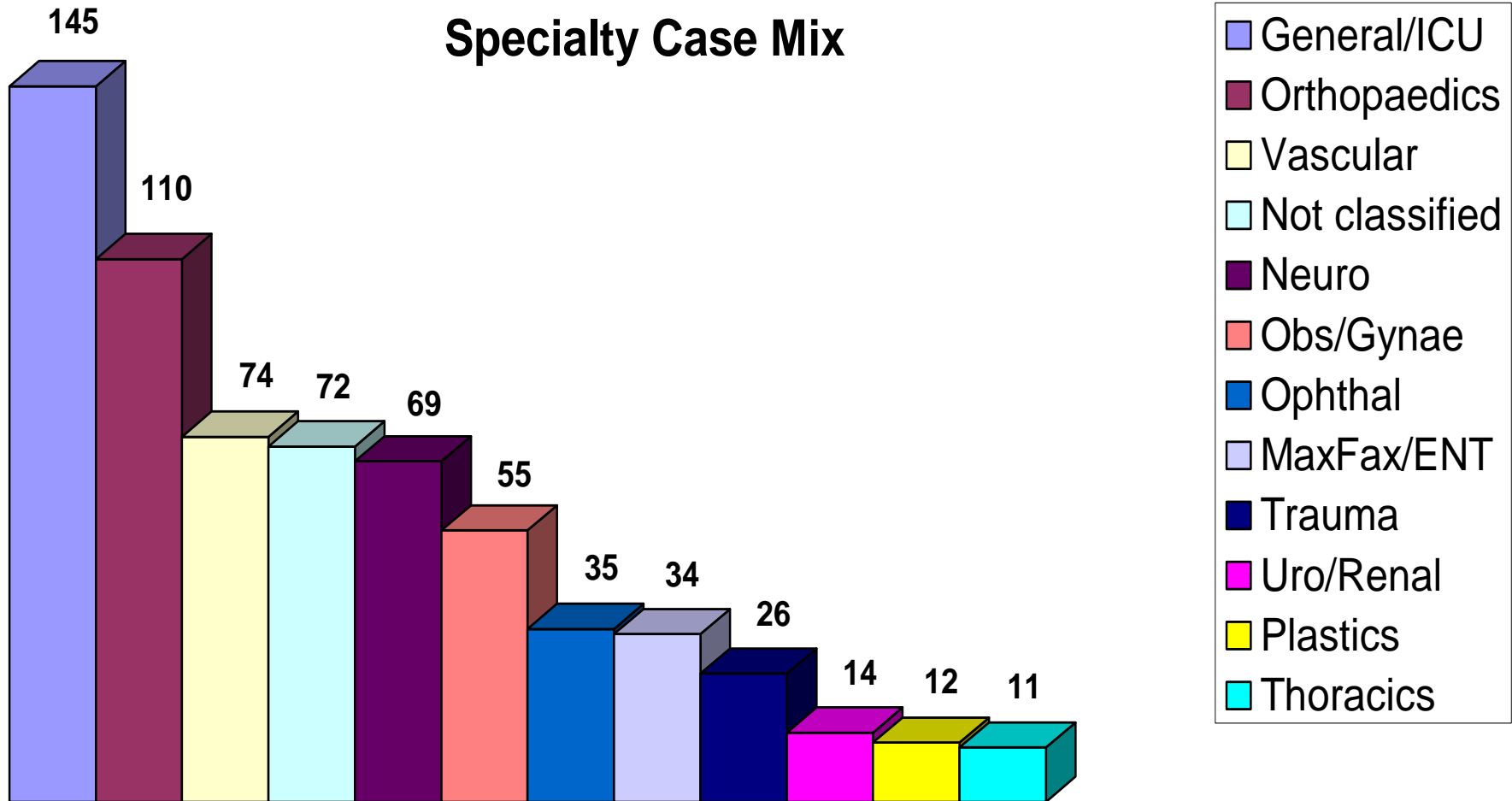
And now for some data.....



Cases by Specialty

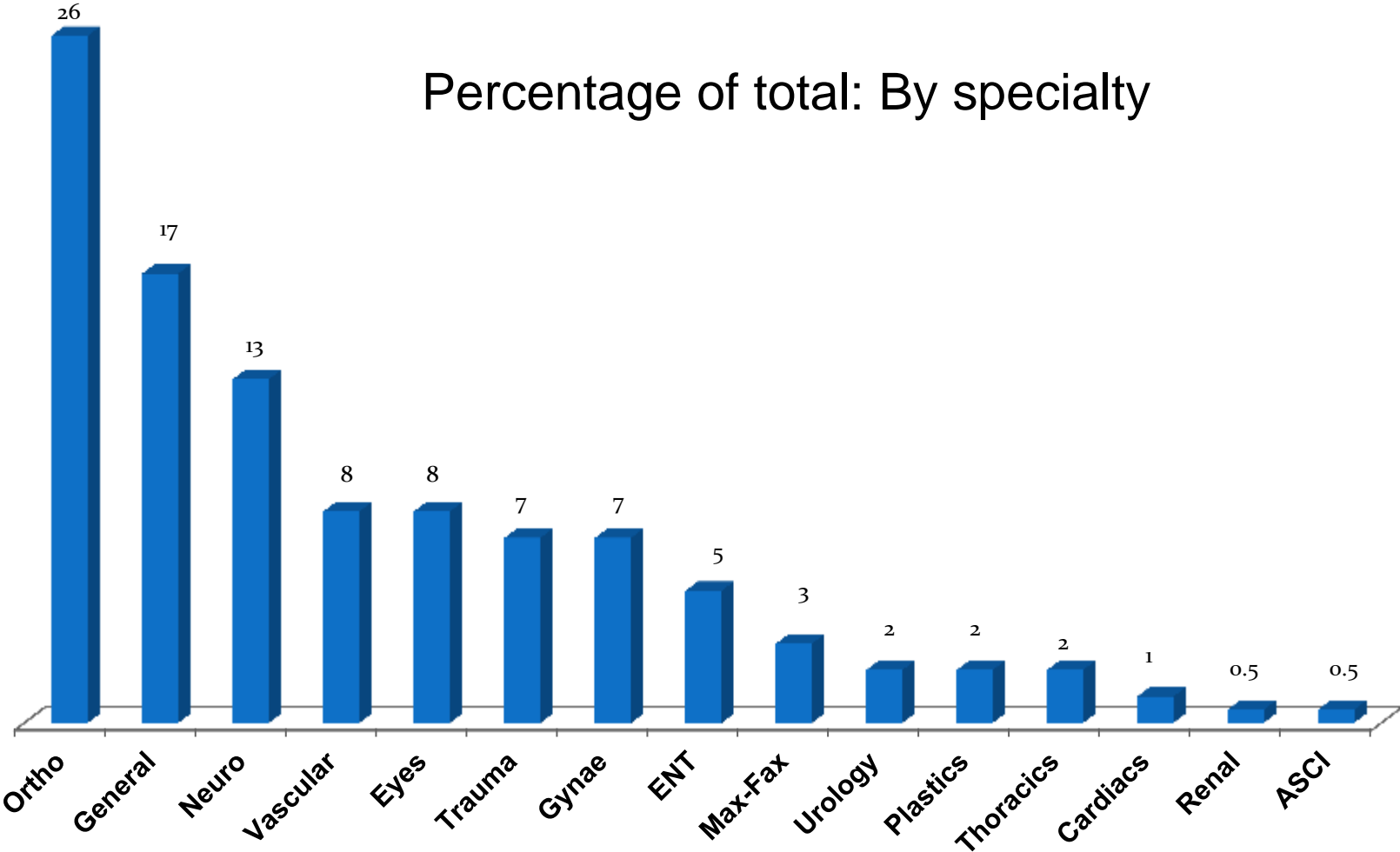


Specialty Case Mix



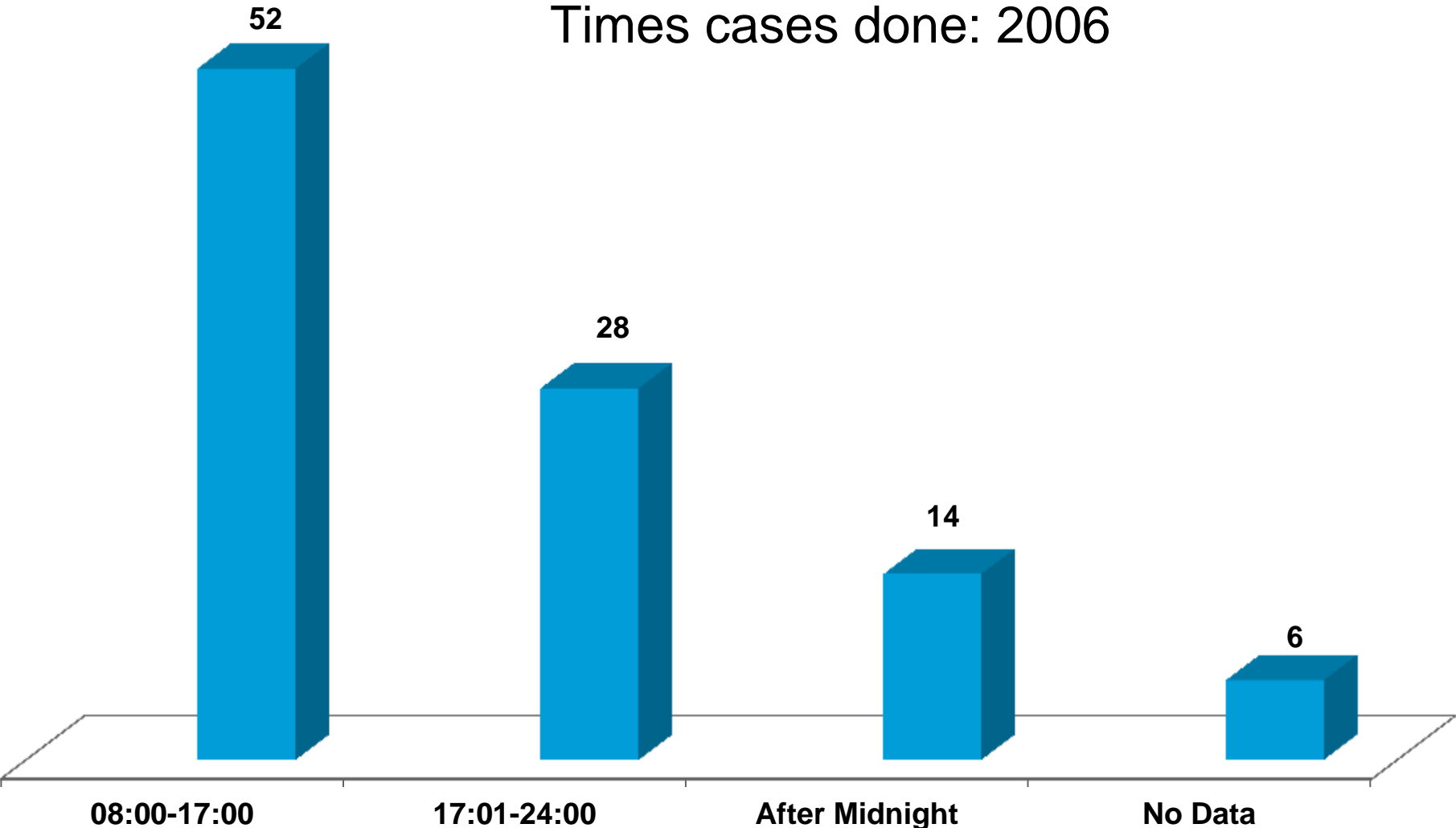
Emergency theatre audit 2006

Percentage of total: By specialty

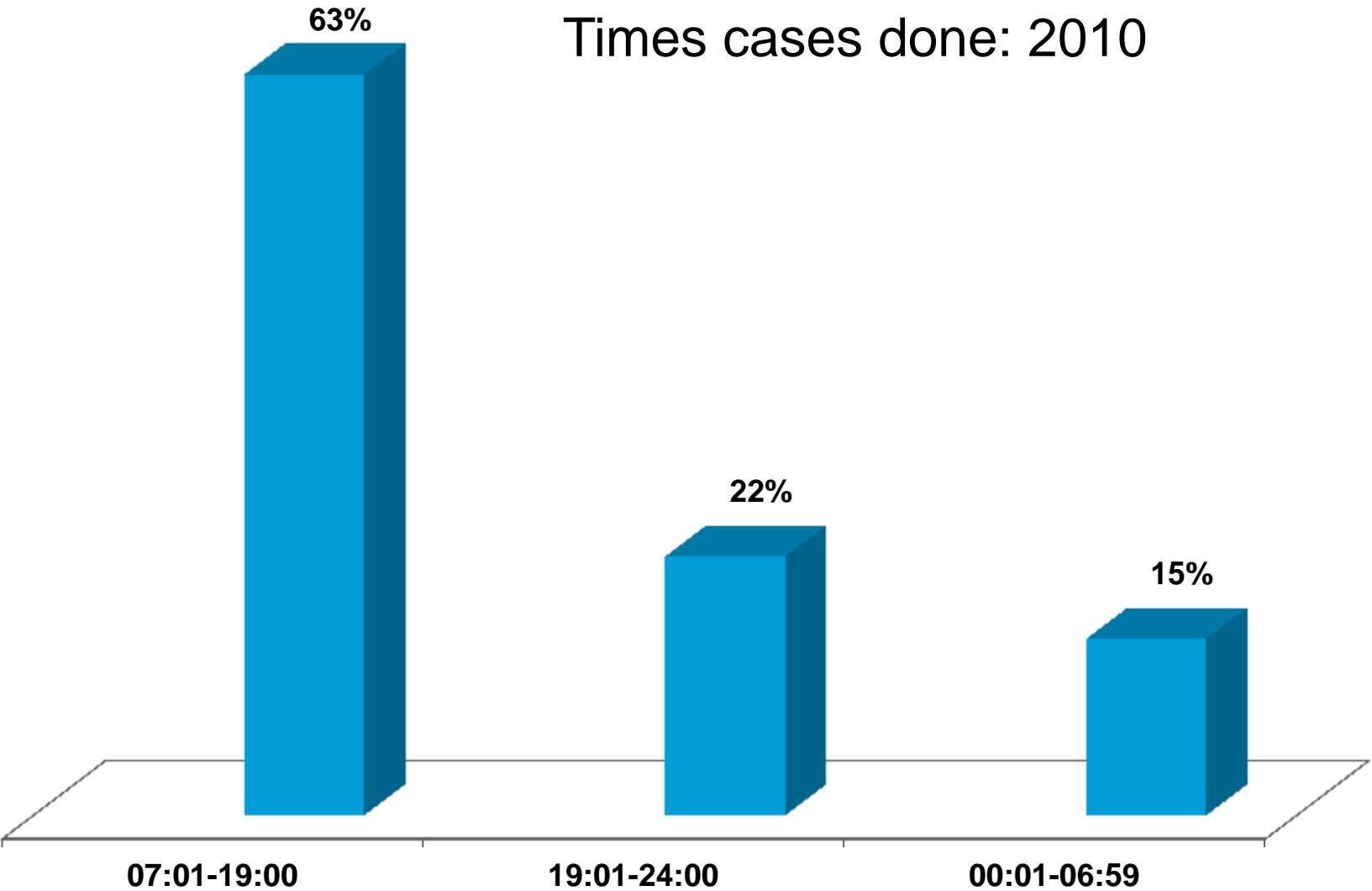


	Booked	Completed	Cancelled/Post.
	136	129	7
	215	197	18
	475	391	84
	507	364	143
	70	46	24
Totals	1403	1127	276

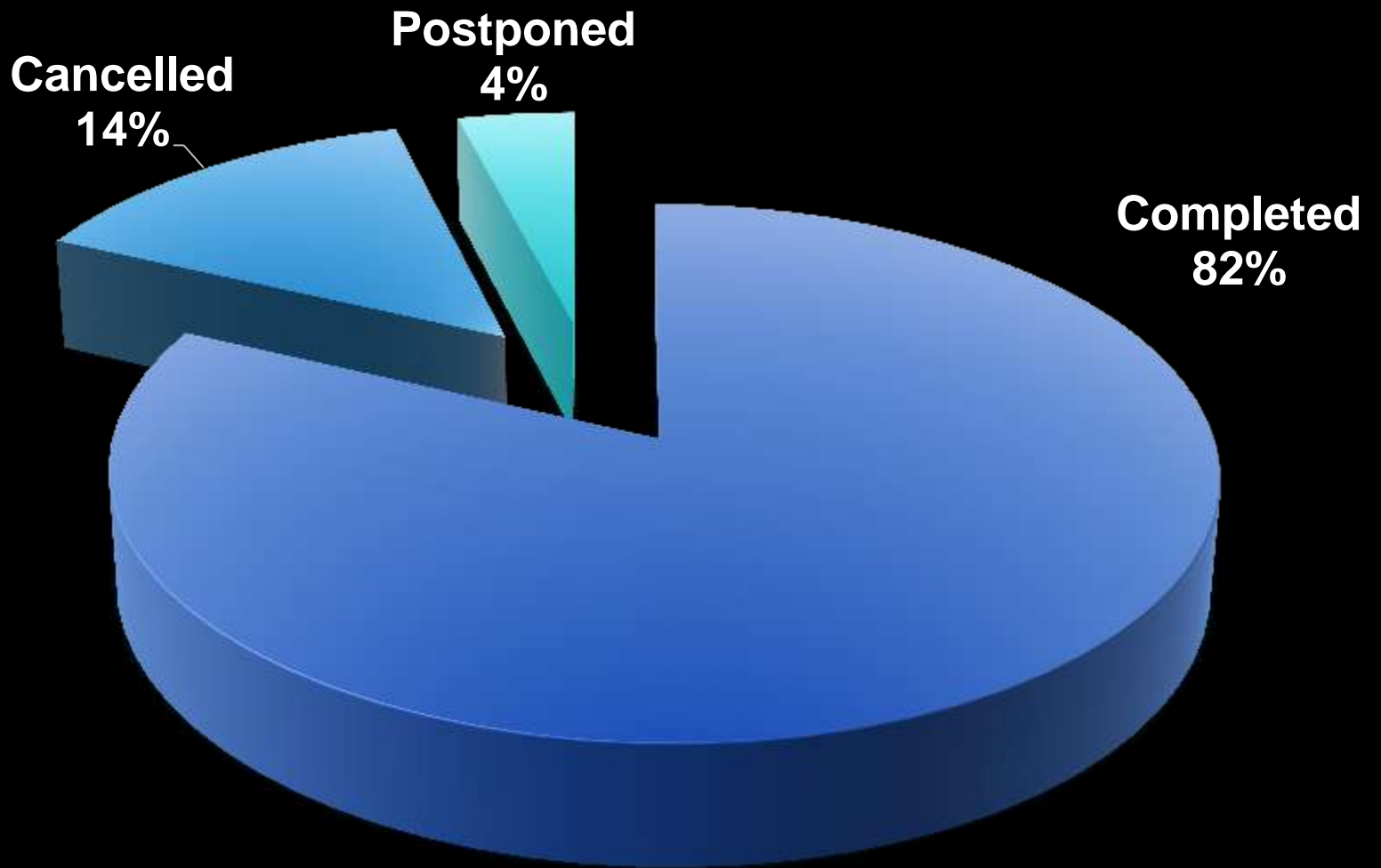
Times cases done: 2006



Times cases done: 2010

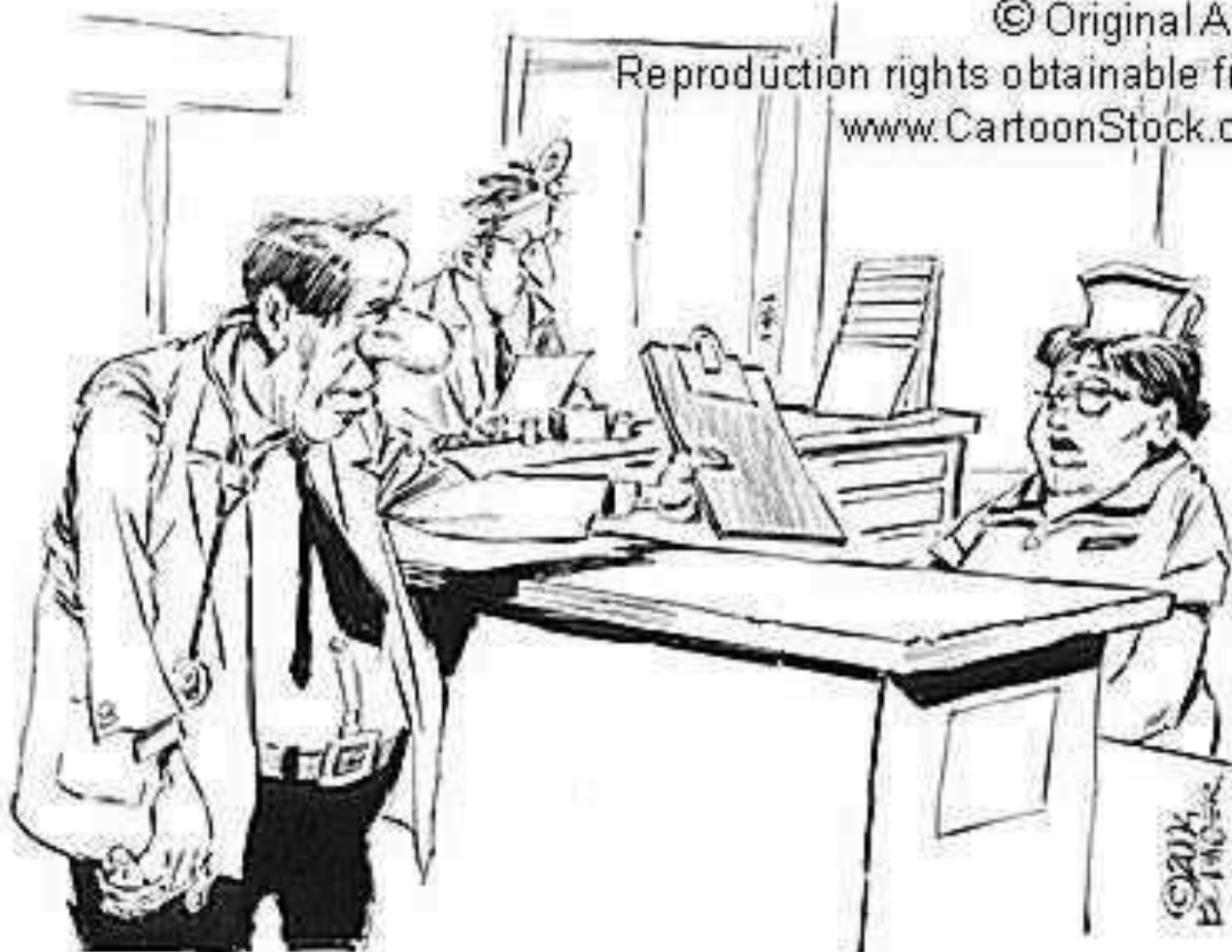


No. Cases (2524)



	No. of Cases	Completed	Cancelled	Postponed	% Re-categorized	% on time
	232 (9%)	216 (93%)	16 (7%)	0	8	92
	370 (15%)	341 (92%)	24 (7%)	5 (1%)	6	94
	856 (34%)	735 (86%)	94 (11%)	31 (3%)	29	71
	918 (36%)	692 (75%)	170 (19%)	56 (6%)	27	73
	166 (6%)	103 (62%)	52 (31%)	11 (7%)	13	87

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search ID: bbon56

"Here's a copy of our new triage plan...the order is now walking wounded first, the dying and dead second, lawyers last..."

