

# A profile of resuscitations at the Kalafong hospital emergency unit

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## ABSTRACT

**Background:** All serious emergency cases arriving at the Kalafong Hospital emergency department are first resuscitated by doctors from the Family Medicine Department. The aim of this study was to construct a profile of the patients that the emergency unit doctors consider necessary to admit to the resuscitation unit and to describe the procedures carried out on them.

**Method:** All data from the records of resuscitated patients from 1 July 2000 until 31 December 2000 were included in the study.

**Results:** During the period of the study, 309 patients were resuscitated. Two hundred and three patient records could be traced, of which five files were excluded due to insufficient data. Medical complications were the most common reasons for resuscitation. These patients presented with complications due to chronic diseases such as heart failure, myocardial infarction, diabetic complications, hypertensive crisis and stroke. Suicide attempts were also common, with organophosphates often being used in the attempted suicide.

Men between the ages of 18 and 40 under the influence of alcohol were the most frequent type of patients resuscitated for trauma injuries. Gunshot wounds and car accidents were the major causes of serious injuries.

**Conclusions:** The disease profile of the resuscitation patients reflects the medical and social problems of our society. A holistic, bio-psychosocial approach to health care in the primary health care setting could prevent resultant mortality and morbidity.

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## Introduction

Kalafong Hospital is situated west of Pretoria, bordering Atteridgeville. It is a secondary hospital with most disciplines at its disposal, except for cardiothoracic and neurosurgery. The Department of Family Medicine runs the emergency unit. The emergency unit has a resuscitation area with one registered nurse per patient and is equipped with oxymeters, cardiac monitors, a blood gas machine, a hematokrit machine and ventilators.

Kalafong Hospital treats patients from Centurion, Tembisa, Laudium,

Atteridgeville and Pretoria West. The patients' socioeconomic backgrounds range from low to middle income. The question that was asked was which patients the doctors consider necessary to admit to the resuscitation unit and which procedures were carried out on these patients.

This study aimed to create a profile of the patients resuscitated at Kalafong's emergency unit, with the purpose of augmenting the training of medical personnel accordingly. It also highlights the common, serious problems that may be encountered

by the general practitioner in South Africa.

## Background

In developing countries, most trauma-related deaths occur in the pre-hospital environment. However, a large number of severely injured patients do reach emergency units and must be managed efficiently to prevent further morbidity and mortality. Research on emergency care helps to broaden knowledge of the management of emergencies and improve the quality of medical students' training.

### The role of alcohol in trauma

The impression of our emergency unit staff is that the presence of alcohol is often a contributing factor to sustaining injuries. Alcohol decreases patients' intellectual and physical abilities, leading to deadly road accidents. According to the literature, trauma patients commonly fit the following profile:

- male;
- between 21 and 50 years old;
- recent loss of income;
- recent arrests;
- previous hospital admission with counselling;
- previous drug abuse; and
- previous trauma and frequently under the influence of alcohol when injured.

### Gunshot wounds

Gunshot wounds are common at Kalafong. Gunshot wounds are potentially lethal and those to the face pose specific management problems. According to Demeriades et al, a common problem encountered in the management of these wounds is failure to identify a potentially endangered airway early enough, as swelling and haematoma in the region can quickly lead to airway obstruction. Another common mistake made is the use of muscle relaxants when intubating a patient with facial injury.

### Assessing the severity of trauma

The Revised Trauma Score (RTS) and the Injury Severity Score (ISS) can be used to determine the severity of injuries. The RTS uses respiratory rate, systolic blood pressure and Glasgow coma scale (GCS) to assess the degree of injury and the prognosis of the trauma patient. Patients with a score of 11 out of 12 are seen as priority one patients (P1). Patients with a score of 10 out of 12 must be admitted to an intensive care unit and have a mortality of approximately 30%.

Lower scores have an even higher predicted mortality.

The ISS divides the body into nine regions. Each region is given a score out of five for the injuries in that region, with zero equalling no injury and five equalling maximum injury. After squaring the individual scores of each region, the three highest scores are added to determine the ISS. A high score predicts a high mortality rate. A score of 75 is considered to be fatal.

### Non-traumatic emergencies

A considerable number of emergency patients seen in the unit suffer from chronic diseases. It is also our impression that the incidence of myocardial infarction treated in the Kalafong resuscitation room is on the increase. Other common emergencies are various diabetic complications. A study done at Hillbrow Hospital in Johannesburg showed that most black patients with hyperglycaemia present with diabetic ketoacidosis. Most of these are caused by infection. Hypoglycaemic comas are also common. Patients with a high risk of hypoglycaemia fit the following profile:

- Insulin or sulfonylurea therapy;
- Older than 80 years;
- African race;
- Treatment with five or more medications; and
- Release from hospital within a 30-day period preceding current admission.

### Research procedure

This study aimed to describe patients whose illness or injury severity warranted admission to the resuscitation room of the emergency unit. Procedures carried out on these patients were described.

The study included all adult patients managed in the resuscitation room of Kalafong from 1 July 2000 to 31 December 2000. Paediatric emergencies are not resuscitated in the resuscitation unit and could therefore

not be included. The notes made by the emergency doctors and nurses in the patient records were used to complete the data capture sheet.

The data capture sheet was used to collect the demographic data, vitals, outcome, techniques used, medication given plus the mechanism of injury. The Injury Severity Score (ISS), Glasgow coma scale (GCS) and Revised Trauma Score (RTS) were compiled and the presence of alcohol in trauma patients was noted. The ICPC (International Classification of Primary Care) was used to classify illnesses.

### Results

During the study period, 309 patients were managed in the resuscitation unit. The files of 203 of these patients could be traced, 198 of which were used. Five files were excluded due to incomplete data.

### Comparison of demographics of trauma and non-trauma patients

Of the resuscitated patients, 65 were admitted due to trauma and 133 were admitted due to non-trauma-related conditions.

Of the non-trauma patients, 46.6% were male and 53.4% were female. Of the trauma patients, 86.2% were male and 13.8% were female. The difference between non-trauma and trauma patients in terms of sex is statistically meaningful, with  $X^2=26.718$  and  $p<0.05$ . (As most of the attempted suicide patients used non-traumatic means, they were classified as non-trauma.)

The age profiles of trauma and non-trauma patients also differ. Trauma patients were generally younger than non-trauma patients.

### Procedures

As illustrated in Table I, the most frequently performed procedure was blood gas estimation, while the placing of a central venous line was rarely performed.

**Table I: Procedures**

Occurrence	Procedures	Total
Common	Blood gas	34
	Intubation	29
	EKG	26
	Gastric lavage	21
Less common	Blood glucose	12
	Intercostal drain	10
Rare	CPR	7
	Central venous line	4

**Table II: Mechanisms of injury**

Mechanism	Frequency	Percentage
Gunshot	23	34.8%
Car accident	15	22.7%
Others	11	16.7%
Knife	10	15.2%
General assault	7	10.6%
Total	66	100%

**Table III: Severity of injury according to mechanism of injury**

Mechanism	ISS: 2-30	ISS: 33-75	RTS: 0 - 10	RTS: 11-12
Shooting	17	4	6	15
Car accident	7	4	5	9
Knife	8	1	3	7
Others	4	4	3	4
Assault	6	1	2	4
Total no. of patients graded	42	14	19	39

**Table IV: Severity of injury vs. outcome**

Outcome	ISS: 2-30	ISS: 33-75	RTS: 0 - 10	RTS: 11-12
Alive	41	10	15	39
Deceased	0	4	4	0
Total scored	ISS: 41	55	RTS: 19	58

### Trauma patients

Car accidents and shooting incidents were the most common causes of injuries. The mechanisms of injuries are illustrated in Table II.

Gunshot wounds and car accidents were not only the most common cause of injury, but also caused most of the serious injuries, as can be seen in Table III.

The outcome of the resuscitation compared to the seriousness of injury is illustrated by using the RTS and ISS. As can be seen in Table IV, there was no statistical significance in the difference between the out-

comes of trauma and non-trauma patients, as 122 non-trauma patients (91.7%) and 61 trauma patients (93.8%) left the unit alive ( $p > 0.05$ ).

Alcohol was deemed present by clinical observation in three out of 121 non-trauma patients (2%) and in 24 out of 58 of trauma patients (41%). The difference in alcohol presence in non-trauma cases versus trauma cases is statistically meaningful, as  $X^2 = 87.065$  and  $p < 0.05$ .

Patients with a GCS of eight or less were intubated and those with a GCS of nine or more were

correctly intubated according to their diagnosis.

### Non-trauma patients

Attempted suicide was the most frequent reason for presentation in non-trauma cases (25 cases). Suicides were classified as non-trauma, as most cases (22) used non-traumatic methods. Heart failure, convulsions and myocardial infarction followed with 13, 12 and 11 cases respectively. Pneumonia, diabetic ketogenic-acidosis, complications of HIV, cerebro-vascular incident, infective diarrhoea, medication overdose and asthma also presented, but less commonly.

Twenty-five suicide attempts were documented during this period. Organophosphate was used in 12 attempts and an overdose of other medication was used in six attempts. Other methods used in suicide attempts were hanging, gunshot to the head and jumping in front of a train.

### Discussion

#### Problems in the execution of the study

Patient information was often incorrectly documented on the daily statistics list. This led to 106 patient records that could not be traced. Clinical notes were often incomplete. This impeded some of the data processing, as the RTS and ISS could not be done on all trauma patients due to a lack of information. This is a cause for concern, as incomplete records not only have medico-legal implications, but may also reflect a lack of insight into the important aspects that need to be addressed during resuscitation.

#### Trauma resuscitations

The high incidence of assault within the trauma group reflects the high level of violence in society. At least 40% of trauma cases resuscitated were related to assault, with or without weapons. This is quite significant

if it is taken into account that most of assault patients seen in the emergency unit do not need resuscitation. From a medical point of view, the high incidence of gunshot wounds is worrying, as patients with gunshot wounds often have more severe injuries and a worse prognosis, as illustrated by six of the patients with an RTS of ten or less.

The high incidence of motor vehicle accident (MVA) injuries was expected, as the road accident figures for South Africa are high. These patients often present with serious injury, as illustrated in this study, with five of the 15 patients involved in MVA having an RTS of ten or less, four of which had an ISS of 33 or more.

Alcohol was an obvious contributory factor in incidents of trauma, being present in 41% of cases. In this study it was particularly men between the ages of 18 and 40 who experienced alcohol-related trauma, which is a slightly younger age group than that found in the study by Ankney *et al.*<sup>4</sup>

From a service point of view it was heartening to find that the personnel followed the guidelines for intubation and that all trauma patients with a Glasgow score of eight or lower were intubated. Patients with a Glasgow score of higher than eight who were intubated were patients with bad facial fractures or inhalation burns with endangered airways. The grades of injuries and outcome also correlated, as expected, as all patients who died in the unit had an RTS of ten or less and an ISS of 50 or more.

## Non-trauma resuscitations

### Suicide attempts

Organophosphate (specifically carbamate rat poison) was used in 12

of the 25 attempted suicide cases. Research shows that taking organophosphate is the most common method of suicide in developing countries.

This probably reflects the ease with which these poisons can be obtained.

The high incidence of suicide attempts and the misuse of alcohol, shooting incidents and assaults discussed before indicate serious psychopathological problems in society. These should be dealt with and the serious consequences prevented at the primary level. Improving the bio-psychosocial management of patients could prevent many of these serious sequelae, the loss of productivity and expensive hospital care.

### Chronic illnesses

Most of the cases of chronic illnesses reflected longstanding cardiovascular disease resulting in complications, such as myocardial infarctions (11), heart failure (13), cerebrovascular incidents (8) and hypertensive crisis (1). Complications of diabetes mellitus were contributing factors in 12 of the resuscitations.

### Procedures and techniques

As expected, the setting up of intravenous lines played an important role during resuscitation. Reading an ECG, operating a defibrillator, taking and interpreting blood gases, performing CPR and intubation are other important techniques at which doctors working in an emergency unit must be proficient.

## Conclusion

The disease profile of the resuscitation patients reflects the medical and social problems of our society. A holistic, bio-psychosocial approach to health care in the primary health

care setting should address the psychosocial problems of patients before they manifest in disease or injury. This approach can potentially play a major role in preventing the resultant mortality and morbidity.✉

## Competing interests

None declared.

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