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Impact of free national emergency trauma service in Irrua Specialist Teaching Hospital, Nigeria

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Abstract

Introduction: The management of patients with traumatic injuries has evolved over the years. Many countries have developed protocols aimed at improving the care and outcome with trauma patients. The government of Nigeria in an attempt to improve on the outcome of trauma care and management established an intervention program known as the National Emergency Medical Service and Ambulance System (NEMSAS). Methods: This study was a prospective study of patients who were managed under the NEMSAS system from July to October 2025.They were admitted through the Accident and Emergency unit, Children emergency or Special care baby units of the Irrua Specialist Teaching Hospital Irrua, Nigeria. Demographic information of recruited subjects was recorded and analyzed. Results: A total of 603 patients managed under the NEMSAS system were seen between July to October 2025. These included adult and pediatric cases. Road traffic accidents made up 30.5% of the total number of patients recorded for the period of study, ranking second after paediatric emergencies. Discussion: 164(89.1%) patients presented less than 6 hours from the time of the injury.150(97.8%) patients had intervention in less than 15 minutes of arrival at the emergency unit while 4(2.2%) had intervention after 15 minutes of presentation at the emergency unit. Conclusion: The impact of the NEMSAS program on the care and management of road traffic accident victims is largely satisfactory.

Keyword: *Trauma, NEMSAS, emergencies, injuries, accidents*

Introduction

Patients with varying severity of trauma are a common presentation in our hospital and they account for many morbidity and mortality recorded in many tertiary hospitals in Nigeria. Traumatic injuries are a global health problem. Most First World countries have developed comprehensive trauma systems to provide optimal care for injured patients[1]. Management of traumatic injuries remains a global health challenge especially in low- and medium-income countries (LMICS). Globally traumatic injuries affect nearly 5.8 million people annually and are the leading cause of lost years of life, estimated to result in 500 years of lost productivity annually per 100,000 population[1,2.] LMICs account for 90% of the global trauma morbidity and mortality rates, with more than 50% of all injuries occurring in Sub-Saharan Africa (SSA). Trauma kills 68 people per 100,000 in SSA, compared to 6.4 people per 100,000 in higher-income European countries [3].

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The management of patients with traumatic injuries has evolved over the years with improvement in

outcomes even with very severe injuries. Several factors are responsible for the outcome of patients with traumatic injuries. Many different trauma systems have been developed in various countries by the slow adaptation of existing hospital systems; the trauma system is structured around the initial pre-hospital management and triage, in-hospital care, and rehabilitation (associated with teaching and research) of trauma victims within a defined geographic area and integrated into a regional public health system [4].A trauma system is a coordinated effort in a defined geographic area that attempts to deliver trauma care to all injured patients and is usually integrated with the local public health system.

Nigeria is an LMIC with approximately 55% of the population in urban centers and 45% in rural areas with poor access roads, inadequate telephone coverage and non-existent resuscitation facilities [5]. With over 200 million people, it is the most populous African country and is the seventh most populous nation globally with GDP per capital ranging from $1,026 to $3,986 [6].

The government of Nigeria in an attempt to improve on the outcome of trauma care and management established an intervention program known as the National Emergency Medical Service and Ambulance System (NEMSAS). It intervenes in trauma cases by providing a coordinated, nation-wide system for rapid pre-hospital response, transportation, and initial in-hospital care in Nigeria. The system aims to significantly reduce mortality rates from accidents and injuries through timely, high-quality interventions. NEMSAS specifically addresses the "golden hour" of trauma care, the critical time interval between injury and definitive treatment, to improve patient outcomes. A key part of the system involves utilizing a network of equipped ambulances to ensure swift responses to road traffic accidents. Ambulance-based emergency medical systems are expensive and remain rare in low- and middle-income countries, where trauma victims are usually transported to hospital by passing vehicles. The program provides free emergency treatment for the first 48 hours at designated and accredited emergency treatment centers and tertiary hospitals. This covers consultations, medications, and even surgical interventions, removing financial barriers to immediate care. Proper documentation and data collection are integral to monitoring the program's effectiveness, such as the impact on waiting times before treatment is initiated at trauma centers.

Critical variables for assessment of outcomes in this program include timing of injury, waiting time in Emergency units and level of satisfaction of patients. Waiting time plays an important role in the assessment of the quality of care in trauma centers and is affected by various factors, including patient turnover, the type and severity of injury or disease condition, and the nature of the hospital setting. Increased waiting time adds to the morbidity and mortality of cases admitted in Trauma centre [5]. This study attempts to study the interaction of these variables as it affects the outcome of patients care.

Materials and Method

Irrua Specialist Teaching Hospital was on-boarded to commence the NEMSAS program in May 2025 and started NEMSAS activities in July 2025.

This study is a prospective study of patients who were managed under the NEMSAS system from July to October 2025, admitted through the Accident and Emergency unit, Children emergency or Special care baby units of the hospital. The spectrum of cases covered by NEMSAS program include Road traffic accidents, Snake bites, Gunshot injuries, Paediatric (including neonatal and under 5 emergencies) . In addition to the free medical service, the patients were conveyed by dedicated ambulances, from the scenes of injuries or the referring centres to the Accident and Emergency Units. Demographic information such as age and sex, information on the duration of trauma, mechanism of injury, injury type, time of admission, interval between admission time and intervention/resuscitation and outcome of patient treatment were noted.

The injury duration was set at less than 6 hours or more than 6 hours before admission into the Accident and Emergency, while the interval between admission and initiation of resuscitation/treatment was recorded at either less than 15 minutes or greater than 15 minutes[7]. The outcome was either satisfactory or unsatisfactory and included those who were either managed non-operatively or operatively.

Satisfactory outcomes include any patient who was clinically stable and was either discharged home or remained in the ward in a stable condition. Unsatisfactory outcomes include deceased patients following the commencement of treatment, patients in critical condition despite days of treatment and those discharged or referred elsewhere due to an incapacitating condition because of initial injury[7] this

is similar to the criteria used by Altine Aliyu Nuradeen et al.

The data analysis was by SPSS version 23.0. The level of significance was set at P<0.05.

Results

A total of 603 patients were managed under the NEMSAS system between July to October 2025.These included adult and paediatric cases that were admitted into the hospital through Emergency points that included the Accident and Emergency Unit, Children Emergency and Special Care baby Unit.

Table 1 Number of cases per month

Month	Frequency	Percentage
July	73	12.1
August	218	31.6
September	178	29.5
October	134	22.2
TOTAL	603	100

The highest number of patients were seen in the month of August with 31.6% and the lowest in the month of July with 12.1%.

The spectrum of patients seen and covered by NEMSAS include Road traffic Injuries, gunshot injuries, snake bites and paediatric emergencies.

Table 2: Breakdown of cases

CASES	July	August	September	October	Total
RTA	22	61	63	38	184
Gunshot	1	2	0	2	5
Snake bites	0	1	0	1	2
Paediatric emergencies	51	154	115	90	412

Road traffic accidents accounted for 184(30.5%) of the patients over the period under study, males accounted for 132 and females 56 with a M:F ratio of 2.4:1. Paediatric emergencies accounted for 412(68.3%) of the total patients. Snake bites accounted for the least number of cases seen2(0.03%).

Table 3 Analysis of Paediatric cases (Under 5 year and Neonatal cases)

CASES	FREQUENCY	PERCENTAGE
Acute watery diarrhoea	73	17.7
Severe malaria	16	3.9
URTI	21	5.1
Meningitis	18	4.4
UTI	11	2.7
Neonatal sepsis	101	24.5
Neonatal jaundice	49	11.9
Pneumonia	22	5.3
Asphyxia	16	3.9
Heart failure	16	3.9

Acute watery diarrhoea {with severe dehydration or shock) accounted for the highest cause of presentation in the under-5 accounting for 17.3% while Severe sepsis from Urinary tract infection (UTI) accounted for the least cause of presentation in this program accounting for 2.6%. The commonest neonatal presentation was neonatal sepsis accounting for 24.5%.

Only patients involved in road traffic crashes (184) in this study were further analyzed.

Table 4: Analysis of Road Traffic Accident Injuries

Regions	Frequency	Percentages
Head and neck	66	35.9%
Chest	23	12.5
Abdomen	23	12.5
Extremities and spine	68	36.9
Perineum	4	2.2

Fractures to long bones and spine were the commonest presentation in patients with road traffic crashes with 68(36.9%) cases recorded while Head injuries accounted for the second commonest cause of presentation accounting for 66(35.9%).

DURATION OF INJURY

Table 5: Duration of Injury of Road traffic accidents patients before presentation

Duration of Injury	Frequency (%)
< 6 hours	164(89.1%)
>6 hours	20(10.9%)

Of the 184 road traffic crashes patients 164(89.1%) presented less than 6hours from the time of injury to arrival at the Accident and Emergency unit while 20(11.9%) arrived at the Accident and Emergency unit after 6hours.

INTERVAL TIME TO INTERVENTION (WAITING TIME)

Table 6 Waiting Time for Road Traffic Accidents patients.

Waiting Time	Frequency (%)
<15minutes	180(97. %)
>15 minutes	4(2.2%)

180(97.8%) Road traffic accidents patients had a waiting time of less than 15 minutes at the Accident and Emergency unit while only 4 (2.2%) had a waiting time of more than 15minutes.

Outcome

The outcome is considered satisfactory or unsatisfactory. Any patient who was clinically stable and was either discharged home or remained in the ward in a stable condition was considered satisfactory while unsatisfactory outcome was used for deceased patients following the commencement of treatment, patients in critical condition despite days of treatment and those discharged or referred elsewhere due to an incapacitating condition because of initial injury.

Table 7: Outcome Table

Variable	Frequency (%)	Outcome		p-value	OR
Duration of injury		Satisfactory	Un satisfactory		
<6hours	164 (89.1%)	152 (92.7%)	12(7.3 %)	0.0001	4.8
>6hours	20 (10.9%)	11 (55%)	9 (45 %)		
Waiting time					
<15 minutes	180 (97.8%)	141 (78.3%)	39(21.7%)	0.0001	3.2
>15 minutes	4(2.2%)	3 (75%)	1(25%)		

Discussion

Trauma (with other emergencies) is a major global public health concern. It accounts for a considerable percentage of deaths, particularly among young adults, and its impact is disproportionately higher in low- and middle-income countries where resources for trauma care are often limited. Trauma-related injuries include road traffic accidents, falls, violence, and workplace injuries, all of which can result in a wide spectrum of outcomes, from minor injuries to life-threatening conditions [8,9,10,11,12].National trauma response systems are organized, multi-layered approaches to coordinate care for severely injured patients, encompassing prevention, pre-hospital , hospital (ER, surgery, ICU), rehabilitation, and data-driven performance improvement.

In Nigeria the National Emergency Medical Services and Ambulance System (NEMSAS) intervenes in trauma cases by providing a coordinated, national system for free, rapid emergency response and medical treatment within the crucial first 48 hours.

Irrua Specialist Teaching Hospital Irrua is one of the tertiary hospitals in Nigeria offering the NEMSAS system by providing free emergency care and treatment to trauma patients. The catchment areas of the hospital include the Edo Central Senatorial District of Edo State and surrounding states like Kogi, Delta and Ondo States.

In this prospective study 603 patients were managed in the NEMSAS program from July to October 2025 (Table 1). Most of the patients were seen in the month of August 2025 accounting for 218(31.5%). This increase over the month of July :73(12.1%) may be from increased awareness of the free services for the first 48 hours.

The spectrum of cases covered by the NEMSAS intervention include cases of Road traffic accidents ,gunshot injuries, Snake bites and paediatric emergencies (under 5 and neonatal emergencies) as shown in Table 2.Paediatric emergencies accounted for the highest number seen making up 68.3% .In the under -5 age group acute watery diarrhea(AWD) with either severe dehydration or shock make up the highest cause of presentation while neonatal sepsis was more commonly seen 101(24.5%) amongst the neonatal age group. Many of these neonatal patients come to the hospital from referring centres and private delivery centres where conditions of delivery are suboptimal.

Road traffic accidents make up 30.5% of the total number of patients recorded for the period of study, ranking second after Paediatric emergencies largely because of the wide spectrum of conditions captured under Paediatric emergencies.

Duration of injury and the waiting time (interval time to intervention) were variables used to determine the effectiveness and impact of this intervention on road traffic accident patients. The injury duration was set at less than 6 hours or more than 6 hours before admission into the trauma Centre. This was aided by the ambulance services and distance of injury scene to hospital. The waiting time was either less than 15 minutes or greater than 15 minutes, this is the time between arrival at the accident and emergency to when treatment or intervention commenced

164(89.1%) patients presented less than 6 hours from the time of the injury. The availability and early deployment of the ambulances to evacuate the accident victims largely contributed to the early presentation of most of the patients. 20(10.9%) patients arrived at the hospital more than 6 hours from the time of injury. Accessibility to remote accident scenes and the deplorable nature of roads are also contributory factors to duration of injury.

150(97.8%) patients had intervention in less than 15 minutes at arrival at the emergency unit while 4(2.2%) had intervention after 15 minutes of presentation at the emergency it. The first free 48 hours treatment nature of the NEMSAS programme allows the patient to access care almost immediately without having to pay for anything, thus reducing the waiting time.

152(%) of patients that had duration of injury time of less than 6 hours had satisfactory outcome while 12(%) had unsatisfactory outcome. 11(%) of patients who had a duration time of greater than 6 hours has a satisfactory outcome while 9 (%) of same group of patients had an unsatisfactory outcome with a p-value of 0.0001 and an OR of 4.8.

141(%) of patients with less than 15 minutes waiting time had satisfactory outcome while 39(%) of patients in this same group had unsatisfactory outcome.3(%) of patients with a waiting time of more than 15 minutes had satisfactory outcome while 1(%) patient in this same group had unsatisfactory outcome with p-value of 0.0001 and an OR of 3.21.

Largely satisfactory outcomes were observed in all the groups of road traffic accidents victims recruited in this study. Compounding factors were observed to be responsible for most of the unsatisfactory cases recorded.

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