



INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION AND MANAGEMENT

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CONTRIBUTIONS TO BOOKS

- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

JOURNAL AND OTHER ARTICLES

- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

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A STUDY ON TIME MANAGEMENT IN EMERGENCY DEPARTMENT THROUGH NETWORK ANALYSIS IN A CORPORATE HOSPITAL

DR. L. KALYAN VISWANATH REDDY
ASST. PROFESSOR
DEPARTMENT OF HOSPITAL MANAGEMENT
HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY
PATAN

HENA CHOWKSI
PG STUDENT
DEPARTMENT OF HOSPITAL MANAGEMENT
HEMCHANDRACHARYA NORTH GUJARAT UNIVERSITY
PATAN

ABSTRACT

Emergency Medicine Department is an area where an emergency patient, who need immediate medical or surgical treatment to preserve life and maintain vital functions. As the demands on the emergency medicine (EM) system continue to increase, improvements in the organization of work and the access to timely clinical and system information will be required for providers to manage their workload in a safe and efficient manner. The aim of the paper is to find the critical pathway, expected completion time and variance of path in the emergency department. The method used is primary data by direct observation through stop watch. Network analysis is drawn as per the activity process flow in the department. This paper discusses and evaluates the performance of the Emergency department in terms of its responsiveness to an emergency as the efficiency of an emergency service is measured by its quickness to provide care with the help of PERT and critical pathway. The result of this study suggest the critical pathway, activity slack time, path duration, expected completion time, variance of path and concludes with the suggestions and importance of golden hour in the life of emergency patient.

KEYWORDS

Emergency department, Flow diagram, Hospital, Network analysis, Program Evaluation and Review Technique (PERT).

INTRODUCTION

The emergency department (ED), sometimes termed the emergency room (ER), emergency ward (EW), accident & emergency (A&E) department or casualty department is a hospital or primary care department that provides initial treatment to patients with a broad spectrum of illnesses and injuries, some of which may be life-threatening and requiring immediate attention. Emergency departments developed during the 20th century in response to an increased need for rapid assessment and management of critical illnesses. In some countries, emergency departments have become important entry points for those without other means of access to medical care. The abbreviation ER is generally used throughout the United States, while A&E is used in many Commonwealth nations. ED is preferred in Canada and Australia, and Casualty is common in Scotland.

REVIEW OF LITERATURE

An emergency is an illness or injury for which the patient requires or desires the immediate attention of a physician (James D. Mills, 1978). The planning of treatment of large number of casualties in a short period was started in ancient times during wars and which have subsequently formed a nucleus of casualty services. Till the turn of the present century, small or large hospitals used to look after acutely ill and injured. As the hospitals developed in quality and numbers, various types of emergency services started developing. A concept of having a separate emergency service can be attributed to increase of accident cases and medical emergencies and the need of providing prompt and efficient treatment to the emergency cases (Major Baldeo Singh, 1985).

The development of quality assurance was interrupted by World War I. Around 1830, the rescue service was mostly the responsibility of Red Cross and fire brigades but included the first actions of emergency physicians (Sefrin P, Weidringer J. W, 1991). After the First World War, significant advance took place in the quality of emergency services due to revolution in various treatment techniques. Since World War II there has been a continual increase in emergency room visits, making effective emergency department management more difficult. By 1960s, the accident room had become a walk-in medical clinic in many communities (Rowland, 1984). In U.S.A, full-time staffing of emergency departments by career emergency physicians began in the early 1960s. In an effort to keep up with the great increase in public demand for emergency department services, physicians have entered this field in great numbers. This kind of physician staffing began as a local phenomenon in response to local pressures. It was a means of providing 24-hour emergency medical service, of providing a safety valve for the physician shortage, and of providing entry into the medical system (James D. Mills, 1978). In 1968, the American College of Emergency Physicians (ACEP) was organized. The college sees the need for specialized training in this dynamic field. It publishes scientific articles in the "Journal of the American College of Emergency Physicians" and also publishes books on management techniques. There has been an increase of more than 600% in the number of emergency visits in some hospitals since World War II. The national average increases 10% each year in USA (Jenkins A.L, 1978).

Emergency department is an area where an emergency patient who needs immediate medical or surgical treatment, to preserve life and maintain vital functions is treated. (Putsep, 1984). Nowadays, an emergency is considered from the patient's perspective. The change in emphasis is profound and its realization is crucial to the understanding of the development of the specialty of emergency medicine. In many of the smaller hospitals (except by chance) there is no physician in the building after the last one makes his rounds in the evening. The concept of critical care round the clock as a 24-hours-a-day, 7-day-a-week service by well trained physicians, nursing specialists and technicians who were prepared to take incisive action to sustain the patient's vital functions is not likely to be disputed. The concept of separate emergency service in the hospital evolved as a result of increasingly large number of accident cases and medical emergencies that report to the hospitals. (Rao, 1976).

SIGNIFICANCE OF THE STUDY

The first 60 minutes of a medical emergency, known as the golden hour is the most crucial. The chances of survival of the wounded or critically ill are better if timely medical attention is paid. The concept of emergency medicine department with round the clock service by well trained staff to sustain the patient's vital functions is undisputed. While the concept of comprehensive emergency care is well established in developed countries, it is far neglected in India. This study has been conducted to evaluate the performance of the ER in terms of its responsiveness to an emergency as the efficiency of an emergency service is measured

by its quickness to provide care. The design of the emergency room, protocols followed play an important role in providing quality care and bringing down the time taken to deliver care. The design and protocols in the ER were studied to understand the areas where improvement is possible.

OBJECTIVES OF THE STUDY

1. To study the response time for each activity in emergency medical services.
2. To study the elements causing delay in providing emergency care.
3. To study issues pertaining to physical facilities, staffing pattern, and allied investigative and admission procedures.
4. To identify the drawbacks and suggest suitable solutions for better functioning of the department.
5. To optimize the time taken at emergency and accident department by applying PERT NETWORK DIAGRAM.

RESEARCH METHODOLOGY

According to Green and Tull, a research design is the specification of methods and procedures for acquiring the information needed. It is the over- all operational pattern or framework of the project that stipulates what information is to be collected from which sources by what procedures.

RESEARCH DESIGN: Exploratory and Descriptive study.

SAMPLE DESIGN:

SAMPLING UNIT: Emergency department.

SAMPLING METHOD: Random sampling.

POPULATION SIZE: 150

SAMPLING SIZE: 30

METHODS OF DATA COLLECTION: By Primary data by Direct Observation and measured the time consumed in the Emergency Department by stop watch.

DATA ANALYSIS TECHNIQUE: Statistical analysis and Operation Research Technique and Analysis by using method PERT and NETWORK DIAGRAM.

LIMITATIONS OF STUDY

1. The sample size for response time analysis varies from process to process, as each patient may not necessarily undergo each and every step of the emergency care delivery.
2. It was not possible to compare the observations with any present set standards, as no such standards are available in our country.
3. One limitation inherent to the method of observation is due to the effects of interactions between the observer and the observed. The presence of the observer tends to make the observed feel conscious and influence his normal behavior and observation may get distorted.
4. But during our study, as we practically observed, this did not occur as in the highly charged atmosphere of an emergency case the staff were more involved in providing care to the patient than feeling conscious of our presence. In fact, our continuous presence in the ER and during the emergency transport process led to uninhibited interactions with the staff when they were not attending to cases. These deliberations gave us an insight into various issues and problems being faced in emergency care delivery, which we would not have known during our limited period of study.

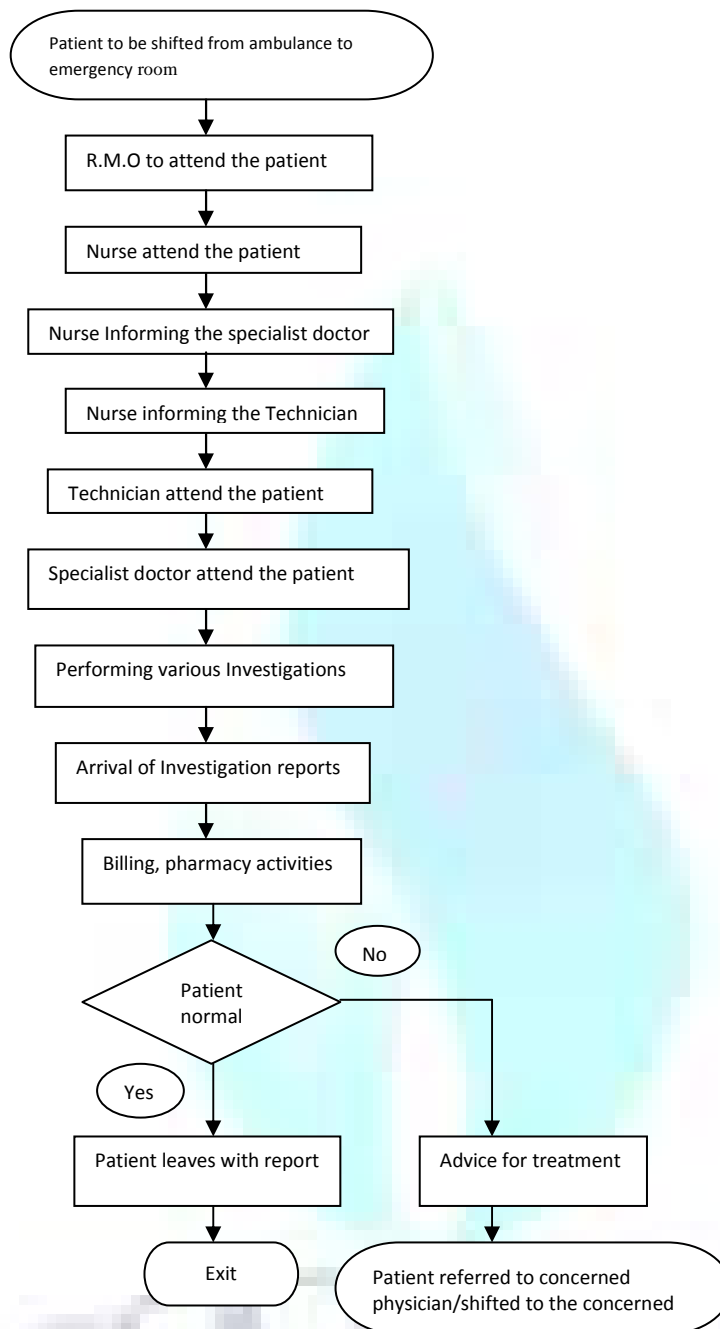
PERT (THE PROGRAM EVALUATION AND REVIEW TECHNIQUE)

Complex projects require a series of activities, some of which must be performed sequentially and others that can be performed in parallel with other activities. This collection of series and parallel tasks can be modeled as a network. In 1957 the Critical Path Method (CPM) was developed as a network model for project management. CPM is a deterministic method that uses a fixed time estimate for each activity. While CPM is easy to understand and use, it does not consider the time variations that can have a great impact on the completion time of a complex project. The Program Evaluation and Review Technique (PERT) is a network model that allows for randomness in activity completion times. PERT was developed in the late 1950's for the U.S. Navy's Polaris project having thousands of contractors. It has the potential to reduce both the time and cost required to complete a project.

THE NETWORK DIAGRAM

In a project, an activity is a task that must be performed and an event is a milestone marking the completion of one or more activities. Before an activity can begin, all of its predecessor activities must be completed. Project network models represent activities and milestones by arcs and nodes. PERT originally was an activity on arc network, in which the activities are represented on the lines and milestones on the nodes. Over time, some people began to use PERT as an activity on node network.

ACTIVITY FLOW DIAGRAM IN EMERGENCY DEPARTMENT ACTIVITY FLOW DIAGRAM IN EMERGENCY DEPARTMENT



PROCESS STUDY BY PERT
ACTIVITY IN EMERGENCY DEPARTMENT

SYMBOL	ACTIVITY
A	Time taken by the patient to be shifted from ambulance to emergency room
B	Time taken by R.M.O to attend the patient
C	Time taken by nurse to attend the patient
D	Time taken to inform the specialist
E	Time taken to call the Technician
F	Time taken by the Technician to attend the patient
G	Time taken by specialist to attend the patient
H	Time taken for performing ECG, x-ray, lab. Investigation. Minor procedure etc.
I	Time taken for report arrival from labs/diagnostics
J	Time taken for registration, billing, pharmacy
K	Time between getting the report & emergency exit.

EXPECTED ACTIVITY TIME & VARIANCE OF ACTIVITY TIME

$$t_e = \frac{t_o + 4 t_m + t_p}{6}$$

$$\sigma^2 = \left(\frac{t_p - t_o}{6} \right)^2$$

THE PERT EVENT TIMES AND OTHER DETAILS AS BELOW FOR EACH ACTIVITY IN MIN

ACTIVITY	PRECEDED BY	t _p (pessi. time)	t _m (most like)	t _o (opt. time)	t _e (expe. time)	S.d	Var.
A	-	2.97	1.431	0.36	1.50	0.435	0.18
B	A	2.5	0.80003	0.173	0.97	0.387	0.15
C	A	1.783	0.664	0.223	0.77	0.26	0.0676
D	B	5.05	2.264	1.05	2.53	0.66	0.44
E	B	3.66	1.218333	0.41	1.49	0.542	0.29
F	E	14.53	3.284667	1	4.87	2.255	5.08
G	D	41.5	12.20833	1.38	15.28	6.686	44.70
H	F,C	44.656	18.802	3.70	20.59	6.82	46.594
I	H	77.66	34.83821	8.34	37.55	11.55	133.47
J	G,H	23.69	15.57333	6.73	15.45	2.826	7.988
K	I,J	21.56	12.61357	5.34	12.89	2.70	7.29
TOTAL					113.89	33.121	246.25

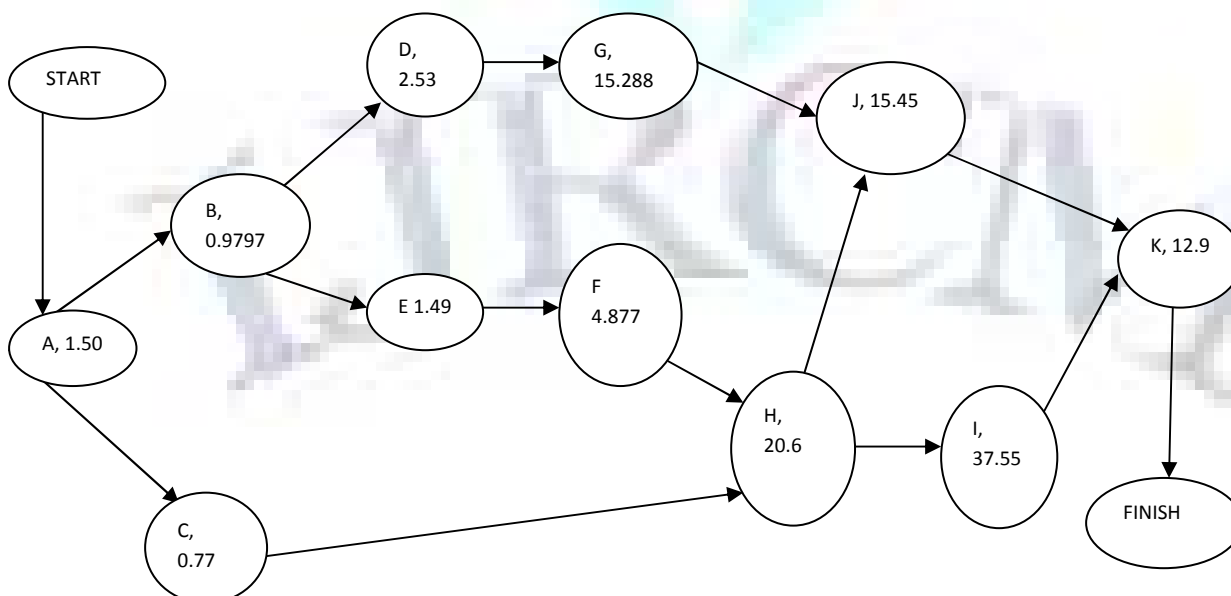
ACTIVITY WITH EXPECTED TIME

ACTIVITY	PRECEDED BY	EXPECTED TIME
A	-	1.50
B	A	0.97
C	A	0.77
D	B	2.53
E	B	1.49
F	E	4.87
G	D	15.28
H	F,C	20.59
I	H	37.55
J	G,H	15.45
K	I,J	12.89

INTERPRETATION

Average time per patient in the study sample is 99.335min.
 Expected time per patient in the study sample is 113.89min.
 Total Standard deviation in the study sample is 33.121min.
 Total variance in the study is 246.25min.

EXPECTED NETWORK DIAGRAM



CRITICAL PATH

A - B - E - F - H - I - K = 1.50 + 0.97 + 1.49 + 4.87 + 20.59 + 37.55 + 12.89 = 79.89 mins (Critical path)

A - B - D - G - J - K = 1.50 + 0.97 + 2.53 + 15.28 + 15.45 + 12.89 = 48.62 mins

A - C - H - I - K = 1.50 + 0.77 + 20.59 + 37.55 + 12.89 = 73.3 mins

A - B - E - F - H - J - K = 1.50 + 0.97 + 1.49 + 15.45 + 20.60 + 12.89 = 52.9 mins

A - C - H - J - K = 1.50 + 0.77 + 20.59 + 15.45 + 12.89 = 51.2 mins

[EARLY START TIME & FINISH TIME]: [T ES, T EF]

[LATEST START TIME & LATEST FINISH TIME]: (T LS, T LF).

SLACK

The slack of an event is a measure of the excess time and resources available in achieving this event. Positive slack would indicate ahead of schedule; negative slack would indicate behind schedule; and zero slack would indicate on schedule.

ACTIVITY SLACK TIME

T ES = EARLIEST START TIME FOR ACTIVITY

T LS = LATEST START TIME FOR ACTIVITY

T EF = EARLIEST FINISH TIME FOR ACTIVITY

T LF = LATEST FINISH TIME FOR ACTIVITY

ACTIVITY SLACK = T LS - T ES = T LF - T EF.

PATH SLACK

DURATION OF CRITICAL PATH = PATH DURATION/PATH SLACK.

ACTIVITY SLACK TIMES IN MIN

ACTIVITY	ES	EF	LS	LF	SLACK
A	0	1.50	0	1.50	0
B	1.50	2.47	1.50	2.47	0
C	1.50	2.27	8.06	8.83	6.56
D	2.47	5	33.72	36.25	31.25
E	2.47	3.96	2.47	3.96	0
F	3.96	8.83	3.96	8.83	0
G	5	20.28	36.25	51.53	31.25
H	8.83	29.43	8.83	29.43	0
I	29.43	66.98	29.43	66.98	0
J	29.43	44.88	51.53	66.98	22.1
K	66.98	79.87	66.98	79.87	0

EXPECTED COMPLETION TIME AND VARIANCE OF PATH - A - B - E - F - H - J - K

EXPECTED COMPLETION

TIME = A - B - E - F - H - J - K = 1.50 + 0.97 + 1.49 + 15.45 + 20.60 + 12.89 = 52.9 MINS

PATH VARIANCE = 0.18 + 0.15 + 0.29 + 5.08 + 46.594 + 7.988 + 7.29 = 67.57 MINS

DISCUSSION AND CONCLUSION

Emergency Room is one of the most critical areas of a hospital when seen in terms of availability of facilities and immediate service. The solutions we propose here are in the light of the fact that services present in the ER may not be utilized on a day to day basis but even so deserve merit because when it comes to dealing with emergencies a hospital cannot bear to lose a patient with an excuse of not having adequate services available. One of the most important factors affecting a patient's survival and the degree of disability is the treatment available immediately after the injury. Genuine emergency patients have to be treated without delay with adequate expertise. The organization and delivery of emergency services as emergency departments have been found to be unsatisfactory and have long been neglected. There has been lot of improvement in provision of emergency care in developed countries, where separate emergency departments have been created at considerable costs. The emergency medicine department provides a unique service, it is neither inpatient nor outpatient in terms of scope or manner and type of operation. While planning and organizing emergency medical services, it is crucial to recognize the complex and volatile nature of the services. The EMD service is expensive and the cost of provision of this service far exceeds cost of general patient care.

FINDINGS

1. Patients should receive immediate response from nursing and medical staff.
2. Specialist doctor taking excess time to attend emergency patient.
3. More time is consumed in shifting patient by attendant when patient arrives at emergency.
4. When ambulance arrives with a patient at emergency, many times attendants and nursing staff are not prepared as security guards delay in informing them by blowing the whistle. So, the Emergency department staff is unaware of patient arrival.
5. Attendants are inadequately trained.
6. Inadequate number of attendants.
7. Delay in the issue of investigation reports.

SUGGESTIONS

1. The major time delay is because of specialist doctor attending the patient. This needs to be minimized by appointing 24 x 7 emergency doctors in Emergency department.
2. Priority given for emergency department patients for investigation report generation.
3. Adequate number of attendants should be provided in the department.

CONCLUSIONS

1. The organization can improve its efficiency and quality care by effective utilization of time in emergency department.
2. Proper allocation of activity in accordance with prompt service timing can save numerous lives and prevent threat of danger to the criticality which will improve the quality and standardization of care of the hospital.
3. All the employees working in the emergency department must be aware of Standard Operating Procedure (SOP) of the department.
4. Prompt and accurate medical care facility increase patient satisfaction which leads to high patient turnover and it indicates the quality of patient care.

REFERENCES

1. Agarwal A.K., (1999), "Planning and Organization of Emergency Services", National Institute of Family Welfare, New Delhi.
2. Baldeo Singh Major, (1985) "A Study Of utilization of Operation Theaters of Accident And Emergency Services", AIIMS, New Delhi, 1985.
3. Beri G.C, (2000) "Marketing Research", 3rd Edition, Tata McGraw Hills Publishing Company Limited, New Delhi.
4. Bernard Y. Tons., (1991) "Design for Health", IHF, Hospital Management International, Edmonton, Canada.
5. Boyle M.F. Eilers., M.A., Hunt R.L., Khromer J and Hamilton G.C., (1990) "Objectives to Direct the Training of Emergency Medicine Residents on off Service Rotations: Emergency Medical Services", Journal of Emergency Medicine, Vol 2, PP 53-54.
6. Dharamraju P., (2002) "Guidelines for Disaster Contingency Plan For Hospital Services, Hospital Administrator" Himalaya publications, Mumbai.
7. Fair, Martin L., (1994) "A Comparative Study of Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), and Graphic Evaluation and Review Technique (GERT)." Master's thesis, Indiana University of Pennsylvania.
8. Francis C.M., Mario C. DeSouza and Roy A.K., (1991) "Hospital Administration", Jaypee Brothers Medical Publishers Pvt. Ltd., New Delhi.
9. James D. Mills., (1978) "Introduction, Emergency Department Organisation and Management", The C.V Mosby Company, Saint Louis.
10. Jeelani Quaridiri C.H. and Anand T.R., (2001) "Study of Accident and Emergency (casualty) in a Teaching General Hospital, Hospital Administration", Vol.17 No. 1, PP 48-52.
11. Jenkins Astor L., (2000) "Emergency Department Organisation and Management", 2nd Edition The C.V Mosby Company, Saint Louis.
12. Mark Antony., (1972) "Layout in the Accident and Emergency Department", An Interim Research Report, Stencil, Medical Architecture Research Unit, The Polytechnic of North London,.
13. Mac Eachern M.T., (1997) "Hospital Organisation and Management", Physicians Record Co., Chicago, Illinois,.
14. Marguerite R. Maancini and Alice T.Gale., (1981) "Emergency Care and the Law", Aspen Systems Corporation.
15. Moder, Joseph J., (1983) "Project Management with CPM, PERT, and Precedence Diagramming". 3rd Ed. New York.
16. NetMBA.com., Internet Center for Management and Business Administration, Inc. Assessed on 7th August, 2011.
17. Putsep Ervin., (1981) "Emergency Department", Modern Hospital, International Planning Practices, LLOYD-LUKE, London.
18. Rao BNB., (1976) "Organisation and Management of Emergency Services", Background documents, NIHA, New Delhi.
19. Rowland Harward S. and Beatrice L. Rowland., (1984) "Hospital Management", Guide to Departments, An Aspen Publication.
20. Seffrin P. Weidringer J.W., (1984) "History of Emergency Medicine in Germany", Journal of Clinical Anesthesia PP. 245-248.
21. Thomas Reddy K., (1993) "Study Of The Emergency Medicine Department At The Nizams Institute Of Medical Sciences With Special Reference To Utilization Pattern And Managerial Issues", Hyderabad.
22. Vohra N. D., (2001) "Quantitative Techniques in Management" – III Edition, Tata McGraw Hill Publishing Company Private Limited, New Delhi.
23. Worthylake Ralph D. and Branch C.H. Hardin., (1972) "The Psychiatric Patient In Emergency Department", Springfield III, PP-277.

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