

Quality Of Healthcare -Especially Patients' Waiting Time- In The Emergency Department At Al Husain Medical City

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Abstract

The objective of this paper is to investigate and clarify the actual time patients wait in the emergency departments before a physical check up is made. Some of the reasons might include overcrowding, limited staff, or the slowness and carelessness of the healthcare personnel.

In this paper, we aim to explore this issue in more depth using an actual and well-known hospital, Al Husain Medical Hospital. We investigated the existence of this quality issue in the Emergency Department at Al Husain Medical City hospital in Amman/Jordan. Data was collected using the official records of the Emergency Room of the actual time patients' spent there for two random days, and a questionnaire that was designed and distributed to a random sample of 50 patients with the help of the quality department at the hospital. Inferential statistical analyses with different tools were used to display the data. In this paper, it was found that the waiting time at the emergency department at Al Husain Medical City was not up to customers' expectations.

Key Words: *Quality, Health Care, Emergency Department, Overcrowd, Patients, Treatment.*

Introduction

Emergency Departments around the world face a serious problem when it comes to the completion of their tasks. The extended waiting time in the emergency department, before the correct treatment is provided, can be a disaster and might lead to a loss of life

Waiting is generally considered a pervasive and arduous element of most customer service situations (Taylor, 1994). For many customers, waiting for service is viewed as a negative experience (Scotland, 1991). Thus, improving the speed at which services are delivered is increasingly becoming critical to service organizations (Katz, Larson, and Larson, 1991).

Many of the challenges facing emergency departments today are the same challenges they had faced for years. These challenges include: overcrowding, limited staff, long waiting times, rushed interactions between patients and care providers. However, today it is recognized that patients' quality perceptions are equally important. Moreover, recent trends in health care competition, transparency, quality mandates, and changes in insurance all place more power in the hands of health care consumers (Rivers, P., & Trzeciak, S. 2003).

In addition, today's revolving healthcare world, Emergency Departments have to turn out to be a significant indicator of the state of the healthcare system in any country. As a result, they became overcrowded, and the time a patient has to spend in the waiting room until he or she receives the appropriate treatment is getting longer. This quality issue is examined in this paper using a real hospital scenario.

Objectives of the study

As the emergency department considered as the first door of access for urgent treatment, the expectations of patients' coming to the emergency department became high. Today's patients expect a high quality care at the time of receiving treatment. This type of quality cannot be achieved, when patients spend hours waiting to see a doctor or to receive a lab result due to the overcrowded emergency department. "Emergency department overcrowding has become an important issue and can be defined as a situation in which the demand for emergency services exceeds the ability of a department to provide quality care with acceptable time frames" (Rawe, B., Channan, P. Bullard, M. and Blitz, S. 2006).

As a result of the effects caused by long waiting time in emergency department, we chose to explore long patient waiting time in the emergency department as the objective of this paper.

Significance of the study

The quality of care is mainly the extended waiting time patients wait in the Emergency Department. This increase in waiting time has led to many negative effects. For example, physicians and nurses feel rushed and overextended, which increase the risk of medical errors. As a result, this will lead to insufficient and compromised patient care. Also, with increasing waiting times, pain relief and improvements in physical, emotional and mental health are delayed outside acceptable limits. According to the joint commission on

Accreditation of healthcare Organizations (JCAHO), “over one half of all cases of morbidity and mortality secondary to delays in treatment occur in hospital emergency departments.” (Rivers, 2003).

This in return, decreases nurse/physician satisfaction as they feel more accountable to provide patients with the best care. However, in the case of overcrowding, it is not possible (The Canadian Association of Emergency Physicians, 2000). As a result, “Overcrowding in the emergency department decreases health care quality and may lead to poor patient outcomes” (Miro.2003)

Hypothesis

In October 2016 a questionnaire was designed and conducted by the help of the quality department at Al Husain Medical Hospital to assess the level of satisfaction among the emergency department patients. 15 paragraphs were put to cover all aspects of the problem. So the hypothesis was, “Patients are not satisfied with the time they spent in the emergency room at Al Husain Medical Hospital.”

Al-Husain Medical City

Al –Husain Medical City is a medical compound of five hospitals situated in Amman, Jordan. The medical compound includes five hospitals and one reference center for laboratory studies on the regional level. The Medical City was established in 1973, and it is one of the busiest hospitals in Amman, Jordan with an annual admission rate of 25,000 patients. The medical city includes ***Royal Rehabilitation Center**: Established in 1983, capacity of 150 beds.***Queen Alia Heart Institute**: Established in 1983, has a capacity of 170 beds. ***Princess Iman Center for Research and Laboratory Sciences**: A reference center for the laboratory investigations, founded in 2001. It received the first place in the accuracy of test results for the diagnosis of thalassemia among 155 global laboratory quality control programs for the global laboratory testing in 2009. ***Prince Hussein Center for Urology and Organ Transplant**: Founded in 2000, has a capacity of 73 beds. ***Queen Rania Pediatric Hospital**: Newly established and treats all kinds of pediatric disorders including cancer of all kinds (Wikipedia).

Literature Review

The Emergency Department is defined as “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” (The Wikimedia Foundation, 2006). Emergency Department is addressed differently in different countries. For example, in the United Kingdom, it is referred to as the Accident and Emergency Department, while in the United States is known as the Emergency Room. Academically and among most professionals, the term Emergency Department is constantly used. (The Wikimedia Foundation, 2006).

Due to the vast development in healthcare systems during the 20th century, Emergency Departments have expanded considerably. This was a result of the increased necessitate for speedy assessment and effective management of serious health conditions. Worldwide, Emergency Department has become an essential division of any healthcare facility and core entrance point to medical care. Hence, many physicians now have specialized in emergency medicine. (The Wikimedia Foundation, 2006).

The Emergency Department requires different equipment and special approaches than the other departments. Patients visiting Emergency Department often have unstable conditions that must be treated immediately. Information such as medical history, allergies, and blood type might be difficult to obtain most of the time. Therefore, Emergency Department staffs are qualified to work fast and effectively with minimal information and under any situation. They function 24 hours a day and 7 days a week. (The Wikimedia Foundation, 2006).

Time is very crucial for the treatment of emergency cases. Therefore, most Emergency Departments have their own diagnostic facilities such as radiology facilities including CT scanners and ultra-monographic equipment. If the Emergency Department did not have its own "STAT Lab" for basic labs tests (blood counts, blood typing, toxicology screens, etc.), tests would be given the first priority to be handled by the hospital lab, and then returned as soon as possible. (The Wikimedia Foundation, 2006).

Emergency Department Typical Layout

Typically, Emergency Department is divided into a number of specialized areas each deals with the different degree of severities or type of complaint. **Appendix A** The most common areas are:

Triage area:

The main function of the triage nurse is to categorize patients according to the severity of their complaints. Patients could be assigned to one of the five triage levels, which are resuscitation, emergent, urgent, less urgent and non urgent. Each level comes with an anticipated response time representing the maximum waiting time. (The Canadian Association of Emergency Physicians, 2005)

Resuscitation area:

It is the most critical area in the Emergency Department. It usually has some individual adult resuscitation bays and sometimes with one pediatric resuscitation bay. Each bay must have a defibrillator, airway equipment, oxygen, Electrocardiogram (ECG) machines, intravenous fluids and lines, and emergency medications.

Majors or General Medical area:

It is the busiest area most of the time and occupied by a variety of medical and surgical cases. Many of the patients in this area will need additional investigation and might require admission.

Minors or Fast track area:

It is used by patients who do not require urgent treatment and have fast treatable cases.

Waiting time in Emergency Department

The waiting time in an Emergency Department involves the time a patient spends in the waiting room till seen by the Physician. For some patients, this time may exceed one hour if they were categorized as less urgent. It could be also, the time a patient spends after being seen by a doctor waiting for lab results or a procedure that need to be done for him. Another type of waiting time in the emergency department is the time a patient spends on an acute care stretcher in the emergency department waiting to be admitted. (The Canadian Association of Emergency Physicians, 2005). In this paper, we will refer to the Canadian Triage and Acuity Scale (CTAS) that was identified by Canadian Association of Emergency Physicians (CAEP) in 1998 to define the medically acceptable wait times in emergency departments. (The Canadian Association of Emergency Physicians, 2005)

Level	Level of Acuity/illness	Nursing Response Time	Physician Response Time	Sentinel Diagnosis	Fractial Response
Level 1	Resuscitation	Immediate	Immediate	Cardiac Arrest	98%
Level 2	Emergent	Immediate	< 15 mins	Chest Pain	95%
Level 3	Urgent	< 30 mins	< 30 mins	Moderate Asthma	90%
Level 4	Less Urgent	< 60 mins	< 60 mins	Minor Truma	85%
Level 5	Non Urgent	< 120 mins	< 120 mins	Common Cold	80%

Canadian Triage and Acuity Scale

Factors causing long waiting time in the Emergency Department

The issues of the prolonged waiting time in the Emergency Departments, in general, are an international continuous epidemic matter. Therefore, many studies were conducted to discover the contributing factors to this issue. The majority of these studies agreed on one root cause which is the Emergency Department overcrowding (Fatovich, D M., Nagree, Y., & Sprivilis, P, 2005). The most common causes for Emergency Department overcrowding found in the literature are *Lack of beds for admitted patients from the Emergency Department *Shortage of physician and nursing staff. *The number and quality of staff in the

Triage Room. *Increased complexity and acuity of patients coming to the Emergency Department. *a large number of patients with non-urgent conditions. *Lack of required diagnostic testing and facilities in the Emergency Department. *The quality of the technology system used in the admission process. *The process prioritizing patient cases to be seen first (Triage scale). (The Canadian Association of Emergency Physicians, 2000)

Satisfaction at Al Husain Medical Hospital

The emergency department aims to provide emergency care to those in need of it, following Ministry of Health policies and procedures. Nurses assigned to this department are 4 in total number. These nurses are assigned to different shift duties in a rotation form. Two general practitioners are assigned to see the attending patients per evening and afternoon shifts. Only one doctor is covering the morning shift due to decreased number of attending patients. The results of this study could be important in improving the patient-centered quality of care in the emergency department, assisting policy-making decisions, and developing staff and public education programs.

Sources of Information

The current study used two sources to get data, secondary and primary sources. In the secondary source, the data was collected from various available sources that include published articles, books, previous studies and website materials in order to form the theoretical framework of the study. The primary source was gathered from the official records of the hospital and the questionnaire that was designed and developed to reflect the study objectives and questions.

Tool of Study - its Reliability and Validity

The tools that were used for this study were the records of the hospital and the questionnaire. In order to check the content validity of the questionnaire an academic professors and professional bodies were asked to verify the content validity of the questionnaire and on receiving their comments the needed amendments were made, and the questionnaire was distributed to the study sample.

To check the questionnaire reliability, Cronbach's Alpha reliability coefficients was used to calculate the study variables.

Research methodology

The emergency department of the selected hospital maintains a folder of emergency care forms for all seen patients. This folder is sent on a weekly basis to the medical record department for permanent filing. The emergency form contains demographic information about the patient, time of arrival, assessment findings and treatment provided, and at the bottom of the form, the time of release is written by the treating physician. On a daily basis, an average of 200 clients attended the emergency department. The majority of those patients attend at the afternoon and evening time of the day.

The head of the department and the nurse in charge were contacted and permission obtained for data collection on patients' arrival time and release (discharge) time. A random sample of 50 patients was selected from a separate inconsecutive two days period. Ten observations were collected every two hours of each day. Some forms were escaped because of unrecorded discharge time. The total number of samples is twenty four making a total of hundred and twenty number of observations over the two days. Knowing the patients' addresses from the discharge forms, we visited 80 patients at their homes but only 25 responded to our questionnaire, and some of the responses were not filled up correctly.

The staff of the department has a rapid turnover with many resignations and arrival of new nurses on a bimonthly basis. However, nurses work under great pressure due to a shortage of staff during various shifts and increased demands by the patients and relatives (see **Appendix B** for the department's process flowchart).

Patients and relatives frequently complain to the administration officer about the delay in response by emergency nurses and physicians.

Limitation

The data for this study were gathered manually from handwritten patient charts and visitations to patients’ homes. Deficits in documentation prevented us from getting an accurate capture of data elements for several patients’ care records.

Convincing the hospital administration to allow me to do this study at their premises was the biggest challenge, and it was finally solved by the help of a Physician after giving a promise to the hospital to not mentioning the details of what we experienced there. Finding the discharged patients’ homes to distribute the questionnaire was another big issue and only 25% agreed to fill up the questionnaire. Therefore the good valid responses that were analyzed were 24.

Data Analysis

Data was collected from a random sample of patients attending Al Husain Medical Hospital’s emergency department. In order to reach a conclusion about the whole population served by this department, inferential Statistics with different tools were used to display the data and SPSS for the questionnaire.

• **Stem and Leaf:**

“This method used in the preliminary analysis to give the real values for the collected data,” (Keller & Warrick, 1999). It divides the observations into two parts stem and leaf. The table below shows the stem and leaf display for the data:

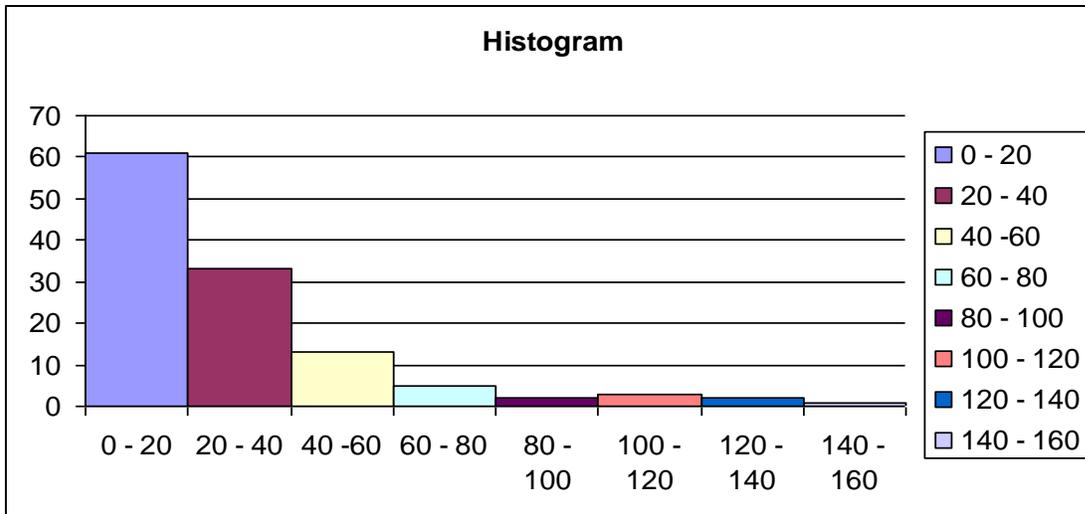
Table (1)

Stem	Leaf
0	66666667777888888999
1	000122223333344444445555566666788888999
2	001111222233d 3445788899
3	0001223356778
4	35556779
5	06678
6	355
7	56
8	27
9	-
10	59
11	1
12	1
13	9
14	-
15	4

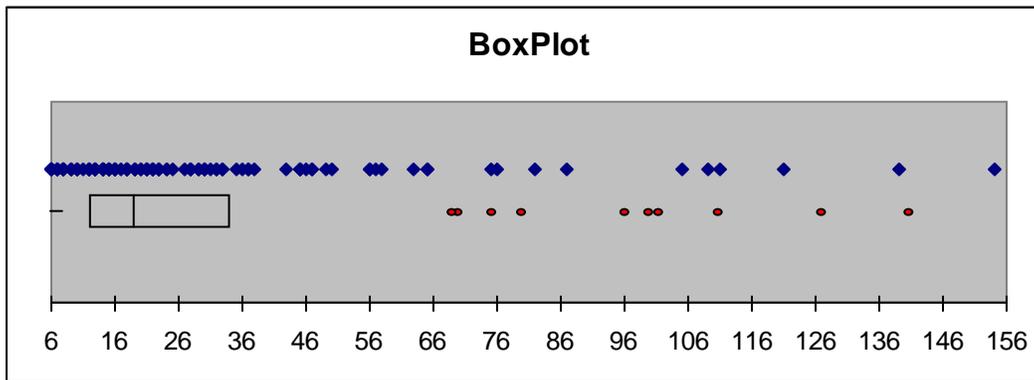
Table (1) above shows that the data is calculated from 6 to 29 minutes. While there is a big variation in the rest of the data.

The figure below shows **the histogram distribution** of the obtained data and the data is concentrated between 0-40 minutes and the shape is positively skewed. This means that the duration of the service is accepted.

(Figure 1)



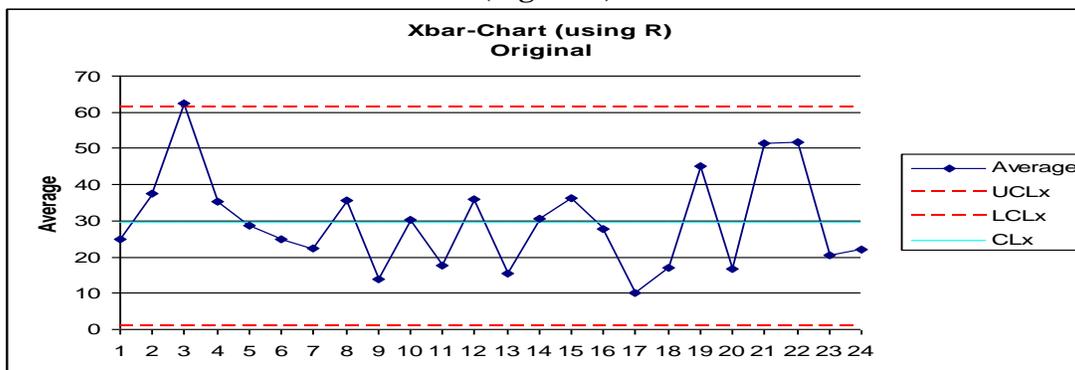
Using the Plot Box bellow (figure 2), we found the same results: **(Figure 2)**



X-R Chart method was used with the variable data to check whether the quality process is under control or out of control by using statistics (Keller & Warrick, 1999).

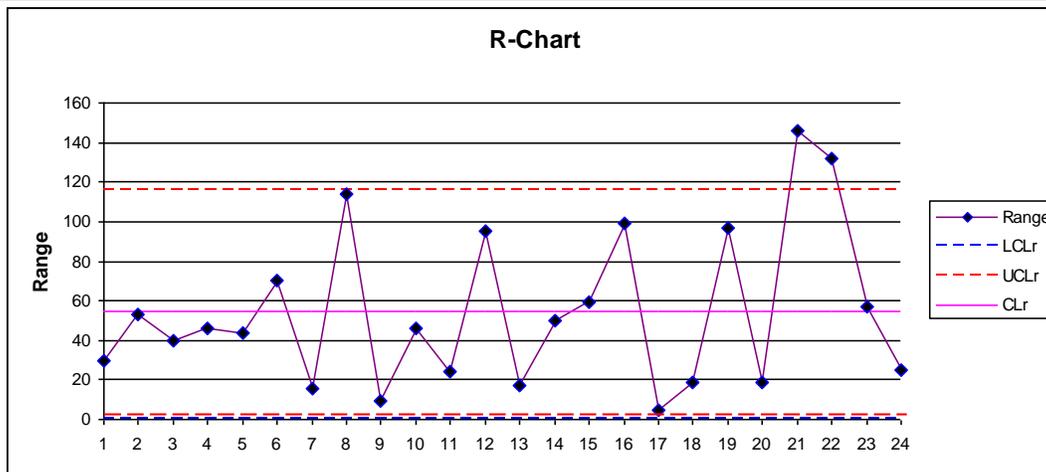
Figure 3 below showed that some observations are near the centre line (CL) = 29.74 and some away from the CL. It was noticed that one value was out of control more than the UCL = 61.24. This was due to special causes related to the hospital circumstances affecting the process at that time.

(Figure 3)



Using the R-chart (figure 4) to check the control limit of the data, depending on the range of the observations it shows the following process:

(Figure 4)



The above figure shows that there are two points out of control due to special causes affecting the process at that time.

• **Capability analyses:**

It is used to check if the measures meet the specification limit or not. In **Appendix D**, we made three tests to change the process to be under control for applying Capability analysis.

The following steps were done to make the process under control as shown in appendix D:

1. Test No 1: Elimination of samples no. 8, 21, and 22 due to the failure of these samples and getting out of control in R-chart, then the process still out of control.
2. Test no 2 was done in R-chart for the elimination of samples No. 11, 15, 18 and are also out of control.
3. Test No.3 was done to eliminate sample (3), and it was got out of control in X-chart.

But the process was under control with the following statistical values:

$$\bar{R} = 34.6471, \bar{X} = 23.7647, UCLx = 43.7561, LCLx = 3.7734, UCLr = 73.2785, LCLr = 0$$

Specifications showed:

- Upper Specification Limit (USL) = 30 minutes.
- Lower Specification Limit (LSL) = 10 minutes.

and from the Data analysis and calculation it was found:

Standard Deviation (s) = $N=5 \rightarrow d2 = 2.326, R \text{ Bar} = 34.6471 \rightarrow s = 14.896 \text{ minutes}$

Capability Index (PCR): compared the 6 standard deviations spread out of measurement to the difference between the upper specification limit and the lower specification limit, which is known as the tolerance (Keller & Warrick, 1999)

$$PCR = 6s / (USL - LSL) = 4.47$$

Capability index (Cp): measures if the process met the specifications or not. If the value of Cp is more than one, the process will be capable, and the larger value of PCR will be more capable

$$- Cp = (USL - LSL) / 6s = 0.2238 < 1$$

➔ **The process not Capable**

It means that the process is poor and it is not within the specification limits.

Conclusion

In this paper, it was found that the waiting time at the emergency department at Al Husain Medical City was not up to customers' expectations. Serious and even fatal medical complications take place, and that gave a negative image of the whole hospital. The questionnaire results prove that modifications are urgently needed to maintain a good reputation of the hospital in the current competitive health care organizations' in Amman, Jordan. Satisfaction rate was 25%, and that means 75% were reluctant to visit that hospital again. The quality

department in the above mentioned hospital has to support the recommendations of this study to better get the support of the hospital administration for actions of improvement.

A significant quality issue was examined in the domain of health care system and the problem of prolonged waiting time at the emergency department of a major governmental hospital in Amman was realized.

The application of statistical process control concepts and charts has facilitated our research of identifying the status of the quality application and provided us with insight into the fact of having a real quality problem.

The factors contributing to the prolonged waiting time have been explored, and appropriate strategies were set as a recommendation for process improvement.

Recommendations

Whenever patients are asked to recall a bad hospital experience, the first thing that jumps to their mind is an emergency room waiting times. So, in order to re-establish patients' confidence in the healthcare system and especially the emergency departments, we can use effective strategies such as:

- Frequent visits to the waiting area by the emergency staff will comfort and reassure patients that they were not forgotten.
- Increasing coordination between all the departments involved such as lab and x-ray departments.
- It was found that half of the patients arrive between 3 pm and 11 pm, so increasing the staff number in the afternoon and night shifts will reduce the waiting time.
- Providing the emergency waiting room with facilities that can reduce the patient stress while waiting. For example, providing television, video tapes that include health education programs, magazines, and newspapers that help patients' benefit from the time waiting.
- The triage staff should be able to prioritize the cases according to the urgency of the patient's case.
- Allocating a separate area with a play room for pediatric patient and their families.

Future Research

This paper indicates a need for further studies comparing the emergency department functions in Al Husain Medical Hospital with innovations such as emergency department observation units and rapid patient admission protocols. Future studies should specifically evaluate the observed changes in staff work- patterns to identify potential measures that may enhance the delivery of efficient care and determine whether safe and effective care is being compromised.

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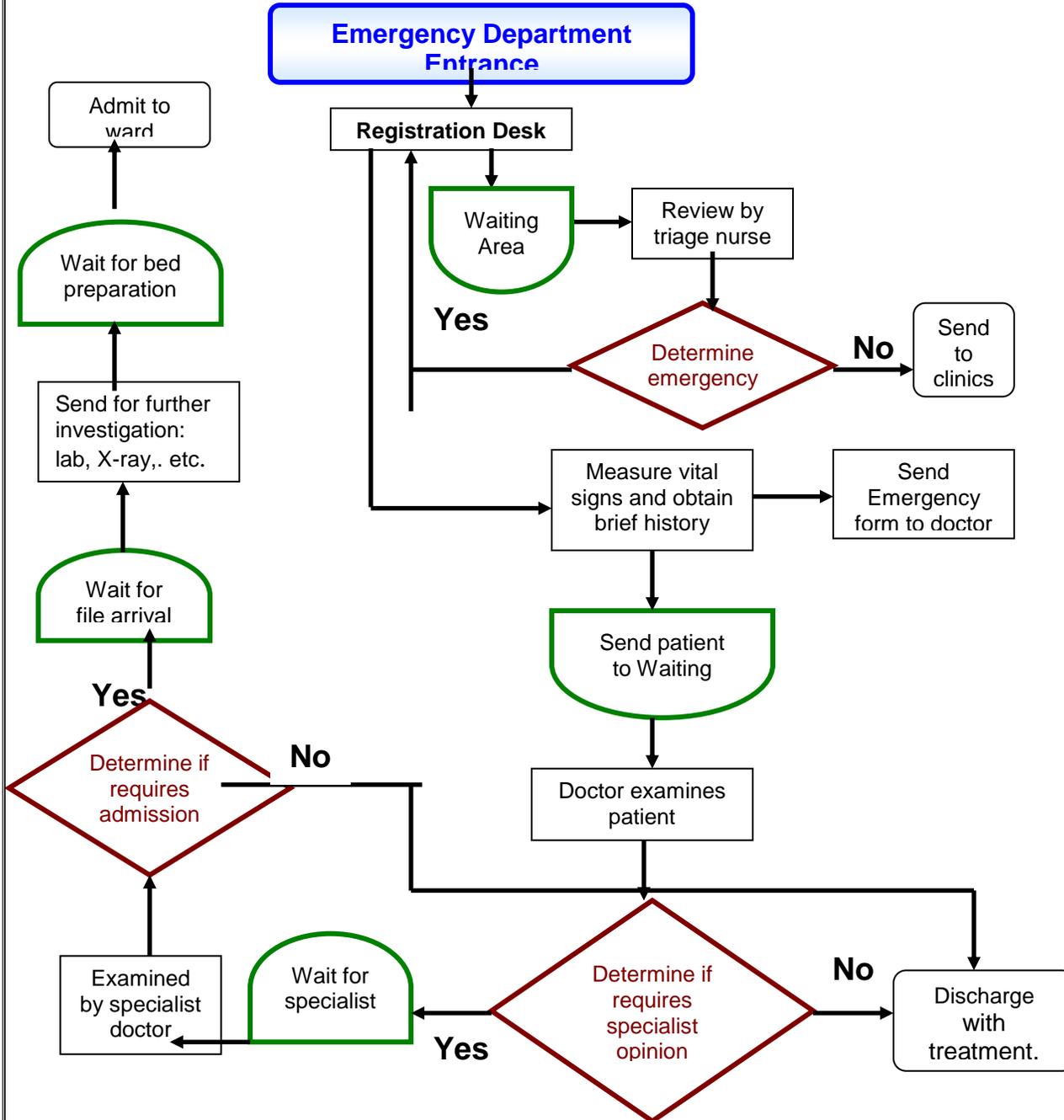
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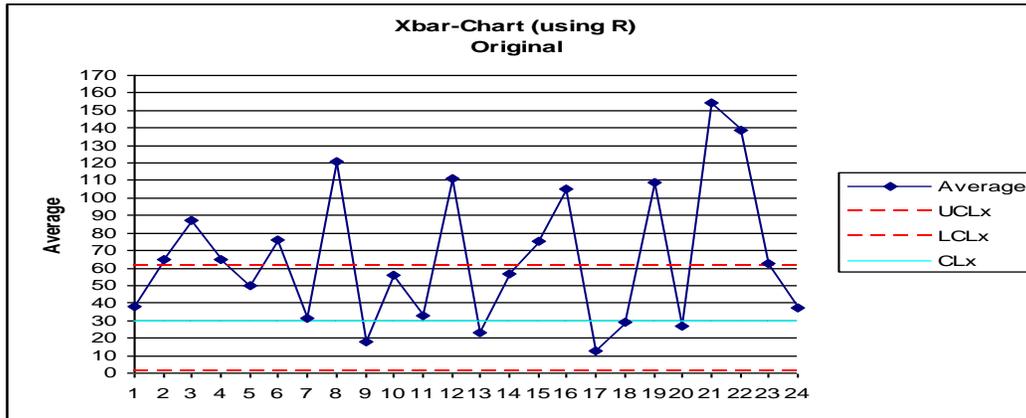
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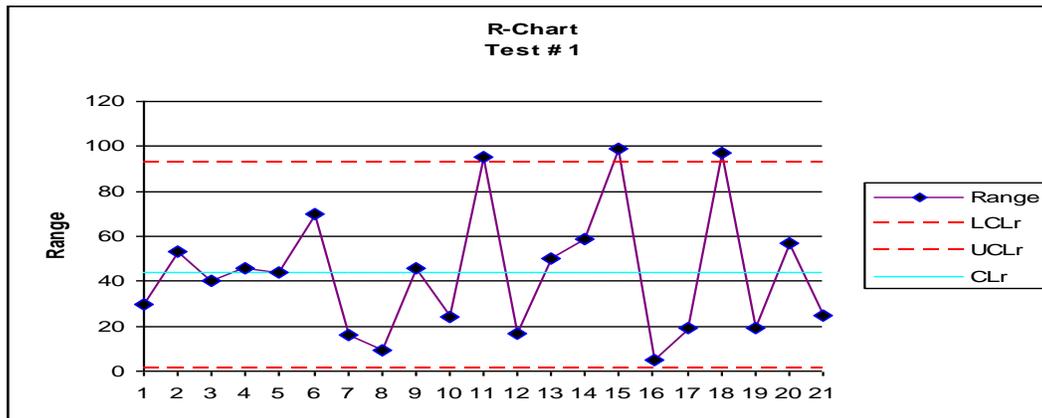
Appendix A
Al Husain hospital Emergency Department Flow Chart



Appendix B



Appendix C



Appendix D

