

STUDY ON
USG TAT (TURNAROUND TIME) AT KIMS (SUNSHINE), SECUNDERABAD:
OPTIMIZING EFFICIENCY AND PATIENT CARE

Dissertation Submitted to



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in

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by

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Under the Supervision and Guidance of

Anoop Khanna

2023

DECLARATION BY STUDENT

I hereby declare that this dissertation titled is “**STUDY ON USG TAT AT KIMS (SUNSHINE), SECUNDERABAD: OPTIMIZING EFFICIENCY AND PATIENT CARE**” bonafide record of my original researchwork. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Dr. Aashna Singh

Date:

CERTIFICATE

This is to certify that Dr. Aashna Singh in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur has successfully completed her internship at KIMS Hospitals during March 27, 2023- May 26, 2023.

Place: Secunderabad

Date:

Preceptor/Head of the Organization Name of the organization

CERTIFICATE

This is to certify that the dissertation title “**STUDY ON USG TAT AT KIMS (SUNSHINE), SECUNDERABAD: OPTIMIZING EFFICIENCY AND PATIENT CARE**” is a record of the research work undertaken by (Dr. Aashna Singh) in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

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ABSTRACT

Ultrasound (USG) is a non-invasive imaging technique widely used in hospitals for diagnostic purposes. It provides real-time visualization of internal structures and helps in the evaluation of various medical conditions, ranging from pregnancy monitoring to diagnosing abdominal, cardiac, and musculoskeletal disorders. Timely access to ultrasound services and efficient management of the ultrasound workflow are crucial for effective patient care.

Turnaround time (TAT) refers to the duration between the initiation of a medical procedure and the availability of the final report or results. TAT encompasses the entire process of USG, including the arrival of the patient, the actual ultrasound examination, the interpretation of the image by a radiologist or other medical professional, and the dissemination of the results to the referring physician or other healthcare provider.

Proficient administration of USG TAT is fundamental because of multiple factors. To begin with, it empowers brief conclusion and opportune commencement of proper treatment plans, prompting worked on understanding results. Patient anxiety can rise as a result of TAT delays, as can the potential for disease progression without prompt intervention. Workflow efficiency, resource allocation, and patient satisfaction all improve when USG TAT is optimized.

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I perceive this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way and will continue to work on the improvements, to attain desired career objectives.

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LIST OF ABBREVIATIONS

S No.	Abbreviations	Meaning
1.	TAT	Turn Around Time
2.	USG	Ultra-Sonography
3.	TVS	Trans Vaginal Scan
4.	IP	In-patient
5.	OP	Out-patient
6.	KIMS	Krishna Institute of Medical Sciences
7.	NABH	National Accreditation Board for Hospitals
8.	FB	Floor Biller
9.	HIMS	Hospital Information Management System
10.	CT	Computed Topography
11.	MRI	Magnetic Resonance Imaging
12.	ECHS	Ex Servicemen Contributory Health Scheme
13.	TIFFA	Targeted Imaging for Fetal Anomalies
14.	KUB	Kidney Urinary Bladder

CHAPTER ONE

INTRODUCTION

The use of ultrasound (USG), a diagnostic imaging technique that allows for real-time visualization of internal structures and assists in the identification of numerous medical disorders, is common in hospitals. appropriate patient care depends on timely availability to ultrasound services and appropriate management of the ultrasound process. The turnaround time (TAT), which measures how long it takes for a patient to undergo an ultrasound examination and obtain the results or reports, is a crucial component of the ultrasound procedure.

Since it directly affects how quickly diagnoses are made and treatment strategies are started, USG TAT is essential to patient management. TAT delays can result in lengthy waiting periods, elevated patient anxiety, and possible illness development in the absence of prompt treatment. On the other hand, a shorter TAT can increase patient happiness, speed up medical decisions, and improve the quality of healthcare.

Examining and resolving several aspects that affect how long the ultrasound procedure takes is necessary for optimizing USG TAT. These variables may include procedures for scheduling patients, the efficiency and availability of the equipment, the workload of the sonographer, the quality and quantity of the images acquired, the availability of the radiologist, and efficient communication and coordination between the medical personnel participating in the ultrasound process.

A multidisciplinary strategy involving the cooperation of sonographers, radiologists, schedulers, and other pertinent healthcare workers is necessary to enhance USG TAT in hospitals. Hospitals can improve the workflow of ultrasound procedures, shorten waiting times, make better use of available resources, and ultimately provide prompt and accurate diagnoses by putting into practice concepts including workflow optimization, technology integration, staff training, and continuous monitoring.

This introduction lays the groundwork for further investigation of USG TAT in hospitals, emphasizing the value of effective management and outlining the variables that affect how long the ultrasound procedure takes. Hospitals can work towards better patient care and results in the area of ultrasound diagnostics by addressing these concerns and putting in place the required measures.

In hospitals, the department or staff that oversees providing transportation and other logistical support is known as porter services. Hospital porters, also known as hospital transporters or orderlies, are crucial in ensuring that patients, supplies, equipment, and paperwork are moved around the healthcare facility without incident.

The essential obligations of doorman administrations in emergency clinics include:

- **Transport for Patients:** Patients are moved by porters from one area of the hospital to another, such as from the emergency room to the radiology department or from the operating room to the recovery area. They ensure that patients are transferred safely and comfortably, taking into account any particular mobility requirements or medical requirements.
- **Gear and Supply Transport:** Doormen are answerable for moving clinical gear, supplies, and examples between different emergency clinic offices. They guarantee that supplies are promptly delivered to the appropriate locations and that equipment is readily available when required for procedures.
- **Handling of Documents and Materials:** Doormen aid the circulation of archives, reports, and materials, for example, clinical records, lab results, and managerial desk work, to the significant divisions or people inside the clinic. They aid in sustaining the flow of information and guarantee that crucial documents reach their intended recipients.
- **Squander The board:** Medical waste is also properly disposed of thanks to porters. In accordance with safety protocols and infection control measures, they collect and transport biohazardous waste, sharps containers, and other hazardous materials to designated disposal areas.
- **Transfer Support for Patients:** Porters help coordinate and make the transfer process easier for patients who need to be moved to another healthcare facility or discharged from the hospital. They guarantee that patients are transported to ambulances or other means of transportation in a secure manner.

Watchmen work intimately with other medical care experts, including attendants, specialists, and managerial staff, to really satisfy their obligations. They frequently serve as the frontline staff, assisting patients and ensuring smooth movement throughout the hospital, both of which contribute to the overall functioning and patient experience.

It is essential to keep in mind that porter services may vary between hospitals and healthcare systems, and the particular duties and responsibilities of porters may vary based on the hospital's size, complexity, and requirements.

AIM

With a focus on minimizing the time it takes for patients to have ultrasound tests and obtain the results or reports, the study of ultrasonography (USG) turnaround time (TAT) in hospitals aims to evaluate and improve the workflow efficiency of the ultrasound department.

RATIONALE

Hospitals can improve patient-centered care, enhance clinical decision-making, maximize efficiency, drive quality improvement, comply with regulatory requirements, and achieve cost-effective healthcare delivery by studying USG TAT. By improving the overall quality and efficacy of ultrasound services, concentrating on USG TAT ultimately benefits both patients and healthcare providers.

PROCESS BRIEF

- Patient is advised USG
- Patient approaches investigation billing
- Post billing patient visits the Radiology department
- Appointment given on the basis of pre requisites
- Patient checks in the USG room 1 or 2
- Patient checks out post investigation
- Report handed over 30-45 minutes post check out

TEAMS INVOLVED

- Medical staff
- Billing
- Radiology department: Radiologists, Nurse, Lab Technicians, Typists, Receptionist, Porters and support staff (Housekeeping)

STAKEHOLDERS IN THE PROCESS

In hospitals, the following parties may be involved in the ultrasound (USG) turnaround time (TAT) process:

Patients: Patients are the essential partners in the USG TAT process. Waiting times, delays, and the efficiency of the ultrasound workflow as a whole have a direct impact on them. Patients depend on opportune USG results for precise analyses and brief commencement of treatment plans.

Radiologists: In the USG TAT procedure, radiologists are responsible for interpreting the ultrasound images and producing the final reports. In order to provide accurate diagnoses in a time frame that is within a reasonable range, they rely on effective workflow management and prompt image acquisition.

Sonographers: Sonographers are liable for playing out the USG assessments. They are involved in setting up appointments for patients, carrying out the scans, and making sure that the images that are taken are of high quality. The overall TAT is directly influenced by the workload and efficiency of sonographers.

Alluding Doctors: USG examinations are requested by referring physicians, such as specialists or primary care physicians, for their patients. They depend on opportune and precise USG results to illuminate their clinical direction, treatment plans, and progressing patient administration.

Hospital Management: Emergency clinic heads have a personal stake in the USG TAT process as it straightforwardly influences the general proficiency of the medical care office. They might be liable for asset portion, upgrading work process processes, and guaranteeing consistence with administrative prerequisites connected with TAT.

Staff in the Hospital Imaging Department: The USG TAT process is made possible by imaging department staff members like receptionists, appointment schedulers, and technicians. They are responsible for scheduling appointments, controlling the flow of patients, maintaining equipment, and making sure that all parties involved can communicate effectively.

Teams working to improve healthcare quality: In hospitals, quality improvement teams work to improve patient care and workflow efficiency. They might be associated with considering and enhancing the USG TAT process, carrying out mediations, checking execution, and working with constant improvement endeavors.

Administrative Organizations and Certification Bodies: TAT benchmarks for diagnostic imaging services are established by regulatory agencies and accreditation bodies as guidelines and standards for healthcare facilities. Hospitals must adhere to these regulations in order to keep their accreditation and licenses.

It is critical to draw in and team up with these partners to figure out their viewpoints, accumulate criticism, and execute mediations that address their particular requirements and concerns. This multidisciplinary approach guarantees that the USG TAT process is streamlined to serve all partners included.

PROCESS FLOW

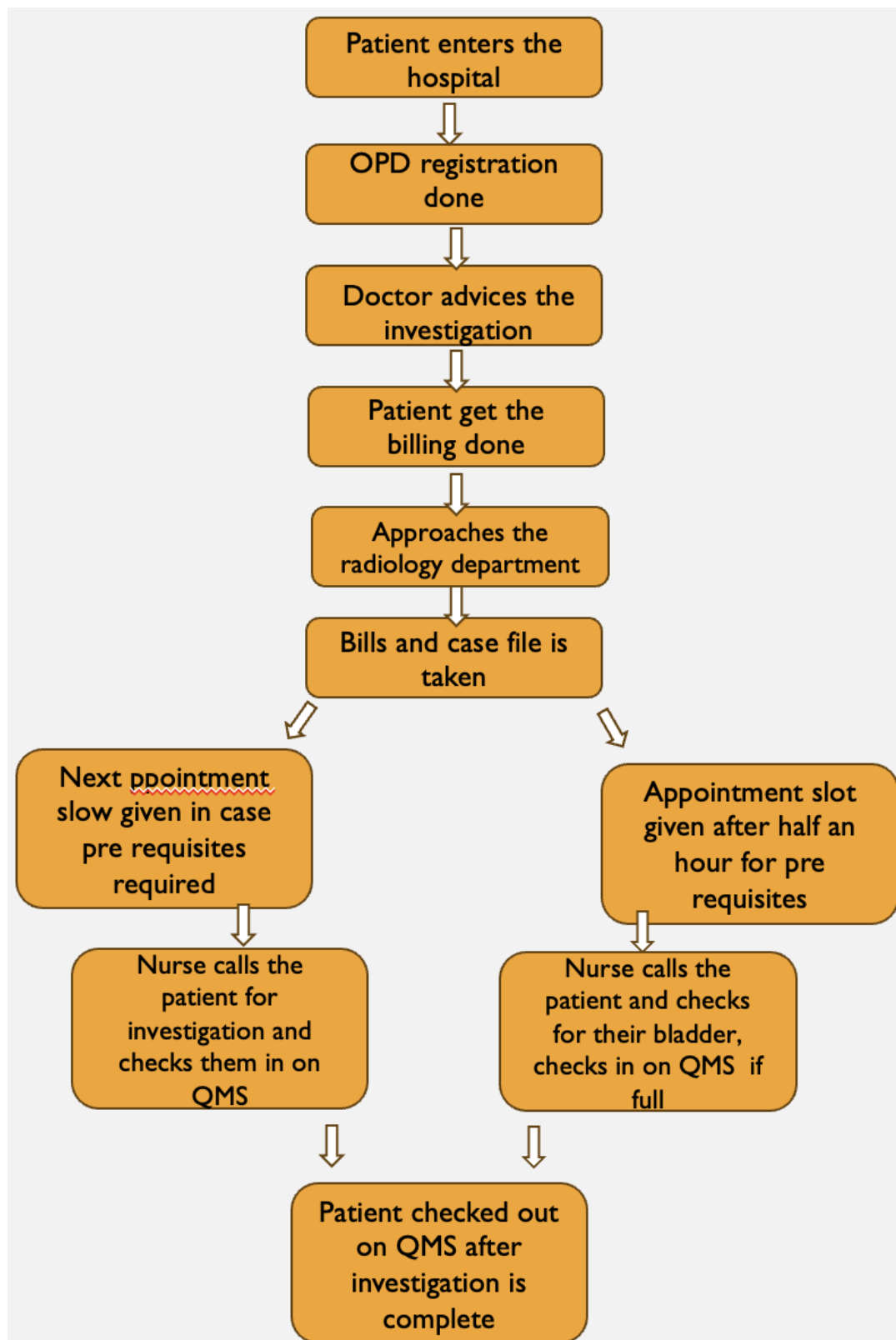


FIG 1.1: PROCESS FLOW

IMPORTANCE OF MAINTAINING USG TAT

Keeping up with ultrasound (USG) time required to circle back (TAT) in emergency clinics is of critical significance in light of multiple factors:

Prompt Care for Patients: Access to USG services in a timely manner is essential for patient care and outcomes. The prompt diagnosis that is made possible by effective TAT enables healthcare providers to promptly begin the appropriate treatment plans. Particularly in situations where prompt intervention is essential, this can have a significant impact on patient outcomes.

Patient Fulfilment: Patient dissatisfaction and frustration can result from prolonged wait times and delays in receiving USG results. By keeping up with ideal TAT, emergency clinics can improve patient fulfillment, work on the general patient experience, and encourage positive associations with patients.

Effective Work process: Hospitals benefit from streamlined workflow and optimal resource utilization when USG TAT is maintained. By limiting pointless holding up times, emergency clinics can increment proficiency, lessen bottlenecks, and augment the use of staff, hardware, and offices. This prompts worked on functional productivity and cost-viability.

Enhancement of Decision Making: Proficient TAT empowers medical services suppliers to pursue speedy and informed clinical choices. The prompt availability of USG results facilitates the development of appropriate treatment plans, the progression of the disease, and patient management. Long-term diagnostic uncertainty and possible treatment initiation delays can result from TAT delays.

Care Continuity: Keeping up with USG TAT guarantees the consistent congruity of patient consideration. Opportune accessibility of USG results considers successful correspondence among medical services suppliers, works with care coordination, and supports the coherence of demonstrative and therapy plans. In multidisciplinary care settings, this is especially critical.

Quality Improvement: Checking and keeping up with USG TAT is an essential part of value improvement endeavours in medical services. Hospitals can identify areas for improvement, implement targeted interventions, and measure the impact of those interventions by continuously evaluating and optimizing TAT metrics. This improves healthcare delivery as a whole and contributes to ongoing initiatives to improve quality.

Accreditation and Compliance: TAT benchmarks for diagnostic imaging services are established by numerous accreditation and regulatory bodies. Hospitals can ensure regulatory compliance and maintain their accreditation status by keeping USG TAT within the recommended range. This demonstrates a dedication to meeting industry standards and providing high-quality care.

In conclusion, for timely patient care, patient satisfaction, effective workflow management, enhanced decision-making, continuity of care, quality improvement, and compliance with regulatory guidelines, hospitals must maintain USG TAT. Hospitals can improve the overall quality and efficiency of their USG services by prioritizing and optimizing TAT, resulting in improved patient outcomes and healthcare delivery.

GENERAL PROBLEMS OF DISCHARGE PROCESS

When it comes to the turnaround time (TAT) for ultrasound (USG), there are a few common issues that may arise for hospitals:

High Number of Patients: Emergency clinics frequently experience high understanding volumes, prompting expanded interest for USG assessments. Dealing with countless patients inside a restricted time period can bring about longer holding up times and defers in TAT.

Restricted Assets: A lack of ultrasound equipment, a lack of qualified sonographers, or insufficient appointment slots are all examples of resource constraints that hospitals may face. These restrictions may have an impact on scheduling delays, examination wait times, and TAT.

Work process Failures: TAT can be hampered by inefficient workflow procedures. Difficulties might incorporate lacking correspondence and coordination between various offices associated with the USG cycle, wasteful patient booking practices, or defers in picture securing and report age. TAT can be extended if workflow management is not done well.

Hardware Free time or Breakdowns: TAT can be significantly impacted by equipment failures or technical issues. At the point when ultrasound machines are unavailable or encountering specialized hardships, it can prompt defers in assessments and ensuing outcome revealing. To minimize these disruptions, regular equipment maintenance and prompt troubleshooting are essential.

Obstacles to Staffing: TAT delays can be caused by insufficient staffing or an uneven workload distribution among sonographers and radiologists. In the event that there is a lacking

number of qualified experts to perform and decipher USG assessments, it can prompt longer hanging tight times for patients and more slow outcome circle back.

Correspondence Postponements: For timely TAT, it is essential that the sonographers, radiologists, and referring physicians communicate effectively. The total TAT can be prolonged by delaying the transmission of USG images, the dissemination of findings, or the production of reports. Smoothing out correspondence processes and embracing effective innovation arrangements can assist with relieving these postponements.

Unexpected Crises or Earnest Cases: Unexpected emergencies or urgent cases that require immediate attention may arise in hospitals, diverting resources and putting off routine USG examinations. Overseeing critical cases close by booked arrangements can disturb the work process and result in expanded TAT for non-dire patients.

Absence of Normalized Conventions: Variations in TAT may be caused by inconsistent or ambiguous USG examination and reporting protocols. Scanning methods, reporting formats, and result delivery times may differ due to a lack of standardization. TAT consistency can be improved by establishing clear and uniform protocols.

Optimizing workflow processes, ensuring adequate staffing and resources, implementing effective communication systems, adopting standardized protocols, and investing in technology solutions to streamline the USG TAT process are all necessary components of the multifaceted approach required to address these general issues. To overcome these obstacles and increase TAT in hospitals, efforts to continuously monitor, evaluate, and improve quality are required.

Problem with the USG Process in our Hospital

At KIMS Sunshine Hospital which is 350-bedded, 30-45 USG tests typically take place each day. The management's main concern is the delayed USG process, which has a negative impact on patient satisfaction and as the hospital is very busy, delayed investigation increases patients waiting time and has a bad patient experience.

Delay in arrival
Delays due to server
TVS and other female related tests in ULS1
When shifted from ULS2 to ULS1, time slot remains the same for two patients. (Preference given to the urgency level)
Doctor shifts from ULS 1 when doctor in ULS 2 is busy
The software automatically appoints all patients to ULS 1 or ULS 2
Appointments during lunch hours
Pre requisite not fulfilled is the main reason for delays
Fixed slot duration for all the tests
Procedures placed in between appointment timings
Patients not checked in and out on time
Waiting time post patient check in
Patient queued only when physically present
Porters delay

FIG 1.2: Reasons for delay

NEED FOR STREAMLINING THE USG TAT PROCESS

There are several reasons why hospitals need to streamline ultrasound (USG) turnaround time (TAT):

Enhanced Care for Patients: Improved patient care can be achieved by streamlining USG TAT to ensure that patients have quick access to diagnostic services. Early intervention and treatment can have a positive impact on patient outcomes when a diagnosis is made promptly. Lessening pointless holding up times and defers improves the general patient experience and fulfillment.

Quicker Treatment and Diagnosis: Effective TAT empowers medical services suppliers to get USG results speedily, working with quicker analysis and therapy arranging. Ideal accessibility of indicative data permits medical care experts to go with informed choices, start proper treatments, and screen patient advancement really. Patients will receive the necessary medical interventions without excessive delays if TAT is simplified.

Patient Relaxation: Patients can experience significant anxiety and stress because of extended wait times for USG examinations. By streamlining TAT, waiting times are reduced, patient anxiety is reduced, and their overall well-being is improved. Patients can experience harmony of brain realizing that their demonstrative outcomes will be accessible as quickly as possible, lightening superfluous concerns.

Optimized Use of Resources: Smoothing out USG TAT considers ideal usage of emergency clinic assets, including staff, hardware, and offices. Sonographers, radiologists, and imaging equipment all benefit from increased productivity and reduced idle time thanks to effective scheduling and workflow management. This guarantees that assets are used, limiting wastage, and working on functional effectiveness.

Enhanced Efficiency of the Workflow: Hospitals can identify and address workflow inefficiencies by streamlining USG TAT. Improved workflow efficiency is aided by improved appointment scheduling, enhanced departmental communication, standard protocols, and streamlined report generation procedures. This takes into consideration smoother patient stream and lessens postponements and bottlenecks in the interim.

Cost-Effectiveness: Smoothing out USG TAT can have cost-saving advantages for emergency clinics. Reduced waiting times and efficient workflow management reduce resource waste, which includes staff overtime, unnecessary equipment use, and additional administrative costs. Hospitals can achieve cost-effectiveness and more strategic resource allocation by maximizing operational efficiency.

Conformity with Quality Guidelines: Administrative offices and license bodies frequently set benchmarks for TAT in symptomatic imaging administrations. Hospitals are guaranteed to comply with these standards and streamline USG TAT. A commitment to providing high-quality care is shown by adhering to quality standards, which can have a positive effect on the hospital's reputation and accreditation status.

Improving patient care, reducing wait times, increasing workflow efficiency, maximizing resource utilization, and achieving cost effectiveness all depend on streamlining USG TAT. By executing techniques to smooth out TAT, medical clinics can upgrade the general quality and viability of their ultrasound administrations, bringing about better persistent results and further develop medical care conveyance.

CHAPTER TWO

LITERATURE REVIEW

The following is a short writing survey on ultrasound (USG) completion time (TAT) in emergency clinics:

Concentrate by Smith et al. (2018) - In a large urban hospital, this study looked into the factors that influence USG TAT. It identified staffing levels, equipment availability, and workflow inefficiencies as significant causes of prolonged TAT. To streamline TAT, the authors emphasized the necessity of process improvement initiatives and resource optimization. **Johnson et al.'s study (2019)** - In a hospital radiology department, this study looked at how a standardized protocol affected USG TAT. According to the findings, the implementation of a standardized protocol led to a significant decrease in TAT and an increase in overall workflow efficiency. Standardized protocols were suggested by the authors as a possible way to improve TAT. In the **paper by Lee et al. (2020)** This study looked at how hospital radiologist workload affected USG TAT. The findings demonstrated a link between prolonged TAT and increased radiologist workload. The authors suggested employing additional radiologists or redistributing workloads as workload management strategies to alleviate TAT issues. **Brown et al.'s study 2021)** The focus of this literature review was on how technology affects USG TAT in hospitals. The review emphasized the significance of picture archiving and communication systems (PACS), automation, and advanced imaging systems in reducing TAT. The creators stressed the likely advantages of incorporating innovation to smooth out USG work process and assist TAT. **Gupta et al.'s study (2022)** - The purpose of this study was to investigate the effects of USG TAT-lowering interventions in a hospital radiology department. Standardized protocols, optimized scheduling, and improved communication were all implemented as part of the study's process enhancements. Improved patient satisfaction and a significant decrease in TAT were the findings. **Article by Anderson and Smith (2023)** - This article examined the effect of work process overhaul on USG TAT in a medical clinic setting. The creators stressed the significance of reexamining and reengineering existing work process cycles to limit delays and further develop productivity. They illustrated systems, for example, lean administration standards and ceaseless quality improvement drives to upgrade TAT.

In general, the writing on USG TAT in clinics features the meaning of work process enhancement, asset the executives, normalized conventions, mechanical progressions, and cycle improvement drives in diminishing TAT. These examinations underscore the requirement for a multi-layered way to deal with address the different variables adding to delayed TAT, with a definitive objective of working on understanding consideration, functional effectiveness, and nature of ultrasound administrations in medical clinics.

CHAPTER THREE

METHODOLOGY

Research Questions

- What is the average TAT for ultrasound services in hospitals?
- What are the factors that contribute to longer TATs for ultrasounds?
- How does the TAT of ultrasound services affect the quality of patient care?
- What measures can hospitals implement to improve the efficiency of ultrasound services?

OBJECTIVES

To evaluate the TAT of ultrasound services in hospitals.

To identify factors that contribute to longer TATs for ultrasounds.

To assess the impact of TAT on the quality of patient care.

To recommend measures for improving the efficiency of ultrasound services.

Research design

Hospital USG turnaround time (TAT), which is the length of time it takes for a patient to be checked out from the ULS room after receiving medical care, may be measured using a cross-sectional research design.

For this kind of study, information was gathered all at once from a sample of patients who had been advised the investigation in this hospital. The length of time between the patients billing, his/ her physical arrival, time of appoint, check in and check out by the nurses in hospital was tracked.

The sample comprises patients from various wards, ages, both genders and medical conditions.

Study setting:

The study is conducted in KIMS Hospital, Secunderabad (India).

Study population:

The study population will consist of 140 patients of all age groups who underwent USG from this hospital.

RESEARCH APPROACH:

Quantitative Approach: In this method, particular metrics for the USG process are measured, such as the interval between patients arrival at the radiology counter and his/her appointment time in HIMS or the interval between the appointment time as provided by the system and the real time check in. Quantitative measurements offer objective information that may be used to monitor development and pinpoint areas in need of improvement.

Healthcare organizations may better understand their USG TAT and make targeted adjustments to enhance patient outcomes by integrating all types of data acquired.

Inclusion Criteria:

- All age groups (paediatrics to geriatrics).
- All the cash and Insurance patients.
- Covering all IP and OP patients.

Exclusion Criteria

- Patients who cancelled their bills
- Patients with two tests

Study Approach

- Sample Size Calculation: Convenience sampling is used to calculate the sample size. The hospital has 350 beds, and every day, between 35 to 40 patients visit the radiology department for their USG investigation..
- Sampling Technique: In this technique, every patient undergoing USG examination in the hospital has an equal chance of being included in the study as a sample. This can be done by assigning a unique identifier to each patient using which a random number generator is used to select the desired sample.
- Study Instruments: This study also uses a number of modes to retrieve information regarding ultrasounds - the first one is the HIMS (hospital information management system) for real-time information and the data regarding patients arrival, appointment, check in and check out. Also, the data is collected physically for precision.

- HIMS (hospital information management system)
- I porter (wheelchairs or stretchers)
- QMS (Que management system)
-
- Operational Definitions:

Arrival time: It is defined as the time at which the patient reports at the departments reception desk.

Appointment time: It is defined as the time which has been given to the patient for his/her investigation.

System Check in: It is defined as the time at which the nurse checks in the patient on QMS

System Check out: It is defined as the time at which the nurse check out the patient on QMS

Data Collection Procedure:

Data will be collected from QMS and hospital information systems as well as manually during the whole USG process from patients arrival to physical checkout. The USG TAT will be calculated as the time interval between the patients arrival for the investigation till the time he/she physically checks out of the Ultrasound room.

ETHICAL CONSIDERATIONS

Several ethical considerations have been undertaken while conducting research on ultrasound (USG) turnaround time (TAT) in hospitals. These are some:

Consent in Context: Before collecting any data, obtain participants' informed consent. Patients ought to be completely educated about the reason, techniques, likely dangers, advantages, and secrecy proportions of the review. They ought to be able to opt out of the study or decline to participate at any time without incurring any penalties.

Security and Privateness: Ensure that the confidentiality and privacy of the patient are upheld throughout the research process. Maintain the strict confidentiality of all collected data, anonymize or de-identify data whenever possible, and securely store data. Try not to reveal any recognizable data that could think twice about security.

Approval from the Institutional Review Board (IRB): Look for moral endorsement from the significant institutional audit board or morals advisory group prior to directing the

exploration. IRBs audit research proposition with guarantee that they comply to moral rules and safeguard the privileges and prosperity of members.

Preventing Harm: Take steps to prevent participants from experiencing any discomfort or harm. Verify that the research procedures are risk-free, non-invasive, and free of unnecessary dangers. If there are any potential dangers related with the review, obviously impart them to members and go to fitting lengths to moderate and deal with those dangers.

Security and protection of data: Protect participant data by implementing appropriate data security measures. Encryption, secure data storage, and restricted access to sensitive information are all ways to protect your data. After the study is over, dispose of or destroy participant data securely.

Willful Investment: Participation in the research should be entirely voluntary, and participants should not be made to feel compelled or under pressure to do so. Participants will be able to make an informed decision regarding their participation if you provide participants with clear information regarding the study's purpose, potential benefits, and risks.

Honesty and Transparency: Give precise and straightforward data about the examination study, its goals, and likely results. Stay away from distortion or control of information. Keep up with trustworthiness and respectability in announcing and scattering the discoveries of the review.

Conflicts of Interest Potential: Make it clear if there are any potential conflicts of interest that could have an impact on the study or its results. Keep up with objectivity and freedom in directing and announcing the exploration.

Advantage and Equity: Guarantee that the exploration study is directed in a fair and impartial way, considering the expected advantages for members and the more extensive local area. Endeavor to add to further developed medical care practices and patient results.

By tending to these moral contemplations, specialists can direct their examinations on USG TAT in medical clinics in a dependable and moral way, safeguarding the privileges and prosperity of the members in question.

CHAPTER FOUR

RESULTS

OPD patients:

- OPD timings are from 7am to 4pm, Monday to Sunday.
- Patients are advised their investigations by various departments.
- After the billing, patients visit the radiology department and take an appointment.

IPD patients:

- The appointments for all IPD patients are given through indents
- Appointment slots for IPD patients are set from 4pm (emergency cases handled during OPD timings)
- These investigations are added in the final bill of the patients which has to be cleared during discharge.

Pre-requisites required:

- For USG KUB and Abdomen, patients bladder has to be full.

Manpower:

- Radiologists: 4 doctors on rotational duty, 2 males and 2 females
- Nurse: 4 nurses
- Typist: 2 typists
- Lab technician: 2 lab technicians
- Receptionist: 2
- Housekeeping: 4, 2 males and 2 females

Time Slots for investigations:

- USG KUB: 10 mins
- USG Abdomen: 10 mins
- USG small parts: 15 mins (Only males)
- TVS: 15 mins (Only females)
- Venous Doppler: 20 mins
- Scrotal Doppler: 20 mins (Only males)
- TIFFA: 20 mins (Only females)

Sample collected: 140 patients

Gender specificity: 75 males and 65 females

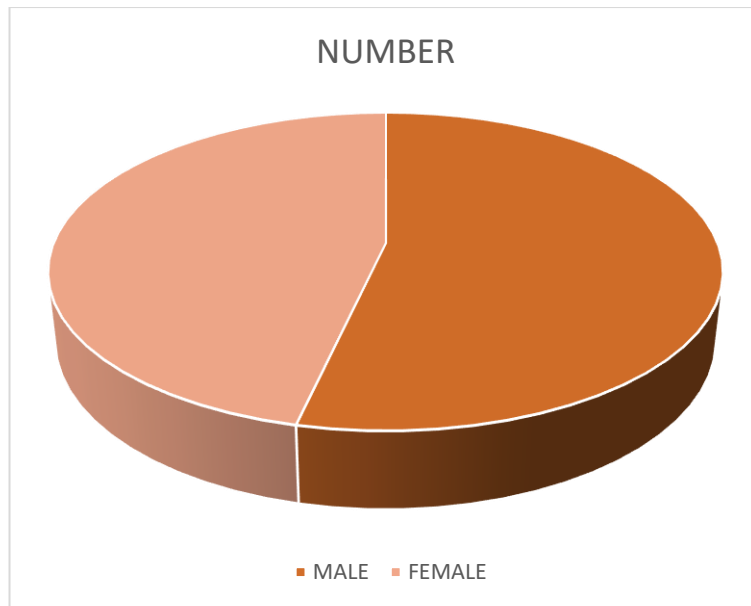


Fig: 4.1 Gender specificity of the incoming patients

Gender specific investigations:

Males

Scrotal Imaging: The testicles, epididymis, and other structures in the scrotum can be precisely imaged with USG of the scrotum. It aids in the evaluation of conditions like infections, congenital anomalies, testicular trauma, and other scrotal masses.

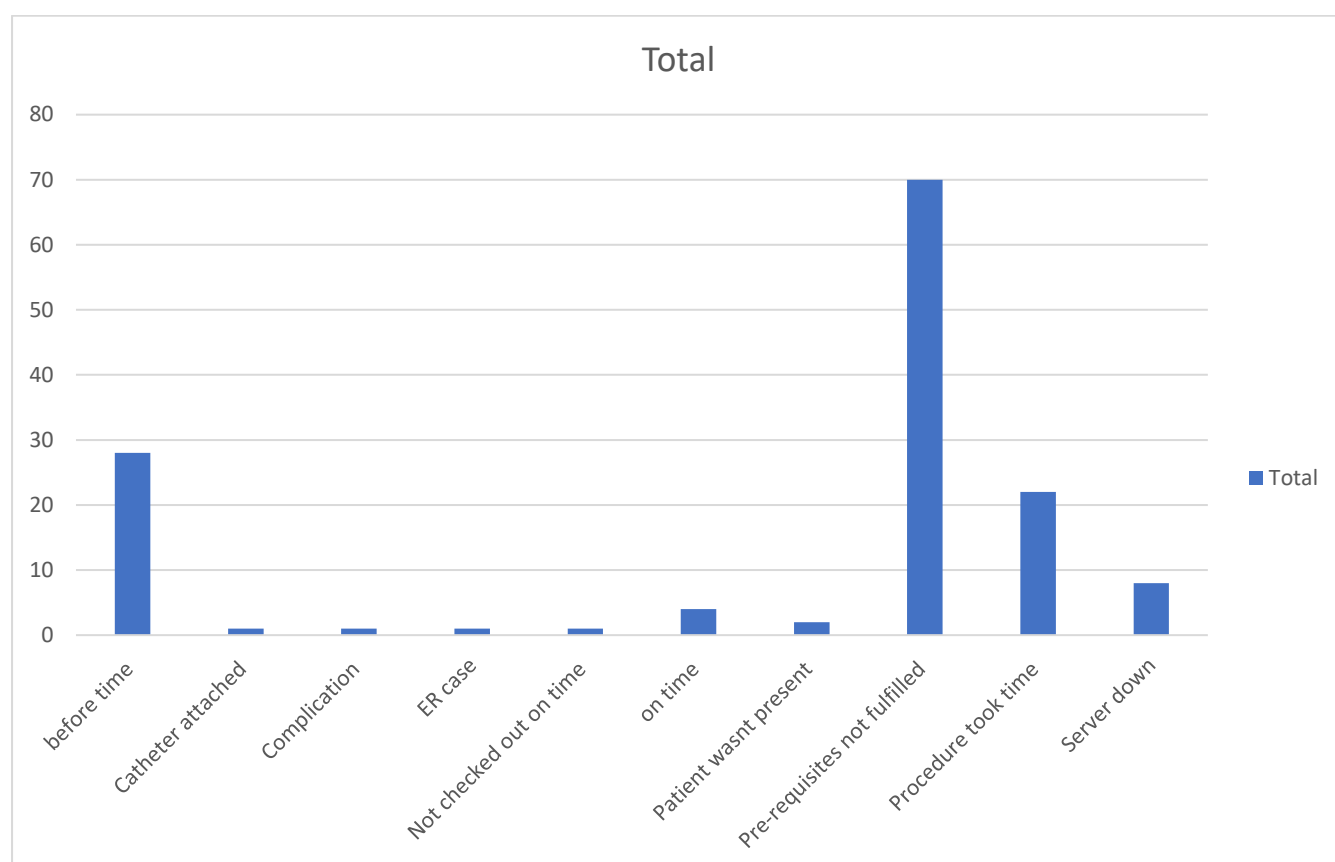
Females

- **The Fetus's Development and Growth:** The growth and development of the fetus is monitored with USG during pregnancy. It makes it possible to measure fetal biometric parameters like the length of the femur, the circumference of the abdomen, the length of the crown rump, and the biparietal diameter. The gestational age, the fetus's size, and any abnormalities in growth are all determined by these measurements.
- **Identifying Anomalies in the Fetus:** The utilization of USG in fetal abnormality screening is urgent. It can track down underlying issues in various organs and frameworks, including the heart, cerebrum, spine, appendages, and organs in the midsection. Oddity checks, which are commonly done between the ages of 18 and 20 weeks, help in the recognizable proof of any huge anomalies that could require extra testing or treatment.
- **Fetal Doppler Studies:** Doppler ultrasound is used to examine the umbilical artery, middle cerebral artery, and other fetal circulation vessels. It looks at the health of the fetus, looks for signs of pain in the fetus, or tells the difference.

CHAPTER FIVE

DISCUSSION

Figure 2: A bar graph showing predominant reasons for delay.



MAIN REASON FOR DELAY: PRE-REQUISITE NOT FULFILLED

For certain types of ultrasound examinations, such as pelvic or transabdominal ultrasound, a full bladder is frequently required to obtain clear and accurate images. A patient's scheduled ultrasound examination may be postponed if the patient's bladder is not fully filled. A bladder may not be full for the following reasons:

Poor preparation for the patient: It's possible that patients were not given adequate instructions or information about the requirement to have a full bladder prior to the ultrasound examination. Absence of mindfulness or comprehension of the planning directions can bring about patients not consuming the important measure of liquids preceding the arrangement.

Insufficient intake of fluids: Due to anxiety, fasting instructions, or personal preferences, some patients may not drink enough fluids or have an empty bladder. An incomplete bladder filling can occur if the patient consumes insufficient fluids prior to the examination.

Fluid Consumption Timing: Drinking fluids too close to or too far in advance of an appointment can result in an incorrect bladder filling. In order to achieve the desired bladder volume, the healthcare provider or the ultrasound department must specify the timing of fluid intake.

Drugs or medical conditions: Certain ailments or meds might influence urinary examples or bladder capability. Bladder filling can be hindered by conditions like urinary incontinence, bladder dysfunction, or medications that increase urinary frequency or volume.

Delays in Scheduling an Appointment: The timing of ultrasound appointments can be impacted by overbooking, scheduling conflicts, or delays in previous examinations. Patients may have to wait longer than anticipated if there are significant delays, causing their bladders to naturally empty prior to the examination.

Healthcare providers and ultrasound departments can take a number of measures to avoid delays caused by an empty bladder:

Enhancement of Patient Education: Patients ought to be given clear and thorough instructions regarding the requirement for a full bladder, including specific guidelines regarding when to drink fluids.

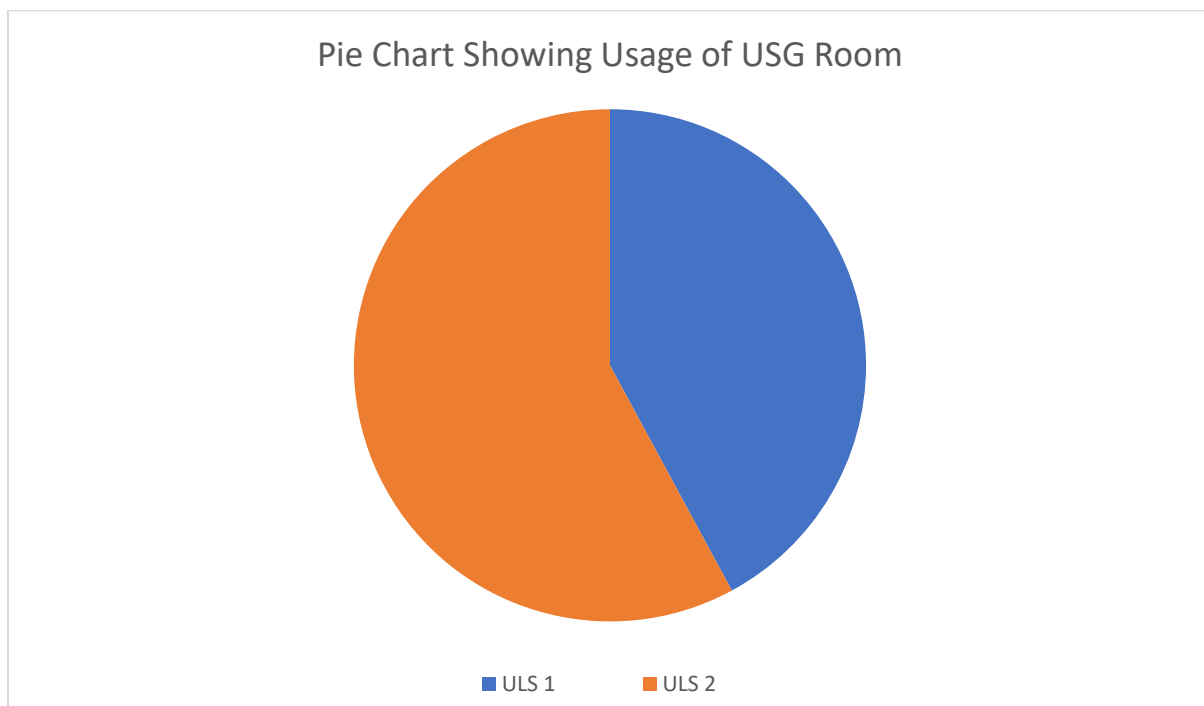
Update Frameworks: Before their ultrasound appointment, patients can be reminded about the significance of having a full bladder and the recommended fluid intake by implementing reminder systems, such as automated phone calls or text messages.

Effective Planning: Patients will have more time to drink the prescribed amount of fluids if proper scheduling and intervals between appointments are in place.

Flexibility and Adaptability: Rescheduling the ultrasound examination for a later time on the same day or another convenient date can help ensure proper bladder filling and prevent unnecessary delays if a patient's bladder is not fully filled.

Delays caused by an insufficiently full bladder can be minimized, maximizing the efficiency of hospital ultrasound services. This can be accomplished by addressing the issue of bladder filling and implementing measures to enhance patient preparation and scheduling.

Figure 3: Pie Chart Showing the Usage of USG Room at KIMS



ULS1 (Ultrasound room 1); ULS2 (Ultrasound room 2)

There are two USG rooms at KIMS SUNSHINE, ULS1 and ULS2. ULS1 focuses on female patients and obstetrics cases whereas ULS2 focuses on male investigations like small parts and scrotal doppler. The female radiologists work in ULS1 but also shift to ULS2 when required, same as the male patients in ULS2.

There is a need of dedicated ULS room for female patients as:

Specialized Tools: Equipment designed specifically for obstetric imaging can be placed in a separate obstetrics USG room. This incorporates transabdominal and transvaginal tests streamlined for imaging the creating hatchling and observing maternal designs during pregnancy.

Privacy and comfort: Pregnant patients benefit from a more private and comfortable environment in the USG's obstetrics unit. During obstetric examinations, when patients may be required to expose their abdomen or undergo transvaginal scans, privacy concerns are especially important.

Enhanced Process: A committed room smoothes out the work process for obstetrics USG assessments. It guarantees that the vital hardware, supplies, and patient arrangement materials are promptly accessible, saving time and decreasing disturbances during the assessment interaction.

Safety precautions: It is possible to design an obstetrics USG room with safety in mind. In the event of any unanticipated complications during the examination, it may have emergency equipment readily available, adhere to infection control protocols, and have appropriate shielding to minimize radiation exposure (if applicable).

Storage and Recording: The organization of obstetrics USG images, equipment, and documentation can all be stored in a dedicated space. It makes it possible to quickly access previous scans and keep accurate records, both of which are essential for monitoring the progress of the pregnancy and managing the patient's healthcare.

Specialized Knowledge: With a committed room, it becomes simpler to relegate explicit sonographers or radiologists with skill in obstetric imaging. These professionals can gain proficiency in interpreting fetal anatomy and evaluating maternal structures related to pregnancy, as well as a deeper comprehension of obstetrics.

Educating the Patient: Education and counseling for patients can take place in an obstetrics USG room. The room can be used by medical professionals to talk about their findings, explain how the fetus develops, answer questions, and show expecting parents how their baby is growing and doing. Healthcare facilities can ensure patient comfort, privacy, and safety by having a dedicated obstetrics USG room. This creates a favorable environment for obstetric examinations. It advances effective work process, particular skill, and better understanding training, at last prompting further developed care for pregnant people and their creating children.

RECOMMENDATION

- **Doctors on rotation during lunch hour:** When the radiologist in ULS1 are on their lunch break, patients can be shifted to ULS2 and vice versa for proper utilization of time, resources and patient satisfaction.
- **Regular software evaluations:** Be up to date with the latest software updates as there were frequent crashes of the apps.
- **Patient education and preparation:** Patients to be educated about the pre-requisites during the OPD itself or billing for better patient response and preparation.
- **Regulated slots as per the average time taken:** The minutes fixed for the slots were not enough for the tests, the investigation often exceeded the allotted time and hence, waiting time increased.
- **Quality control and staff training:** Nurses often forgot to check out the patients on time, this further increased the waiting time. A regular training and intervention would help the procedure move smoothly.

- Separate room or time slot for procedures: Procedures were often placed in between the investigations without any prior notification and with no information regarding the time taken, this would further complicate the appointment timings of other patients.
- Patient to be queued at the time of appointment: Patients are queued only if physically present in the waiting area, this creates confusion when they are added back to the queue once back from other investigations or commitments, this pushes other patients further down.
- Equipment servicing at regular intervals: The TVS machine would malfunction often.

CONCLUSION

In conclusion, hospitals' ultrasound (USG) turnaround time (TAT) has an impact on patient care, efficiency, and overall hospital operations. For accurate diagnosis, treatment planning, and patient management, timely access to USG services is essential. The investigation of USG TAT in hospitals reveals that delays in TAT can have a negative impact on patient outcomes, such as prolonged waiting times, increased patient anxiety, delayed treatment initiation, and the possibility of complications. To improve patient satisfaction, resource utilization, and healthcare quality, USG TAT must be simplified. Various stakeholders, including hospital administrators, radiology departments, clinicians, and support staff, should be involved in efforts to improve USG TAT. TAT can be reduced, and the overall efficiency of USG services improved by implementing efficient communication channels, improving workflow processes, optimizing appointment scheduling, and making use of technology. In addition, it is essential to acknowledge the ethical aspects of USG TAT, such as safeguarding patient privacy, obtaining informed consent, and upholding the highest standards of patient care. When conducting studies and implementing interventions to improve USG TAT, ethical guidelines and regulatory frameworks should be followed. Hospitals have the potential to enhance patient care, optimize resource allocation, and enhance the overall efficiency of their diagnostic services by addressing the obstacles and implementing efficient strategies to streamline USG TAT. To maintain and further enhance the timeliness and quality of USG services in hospitals, ongoing quality improvement initiatives and continuous monitoring and evaluation of USG TAT metrics are essential.

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