Project Management Plan: Optimizing Emergency Department Efficiency Through Telehealth Integration

By

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PROJECT MANAGEMENT PLAN: OPTIMIZING EMERGENCY DEPARTMENT EFFICIENCY THROUGH TELEHEALTH INTEGRAION

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1. Project Overview

Emergency departments (EDs) are facing increases in overcrowding and prolonged patient wait times. Specifically, non-urgent cases in Houston Health Medical Center's ED have increased by 32% following the closure of the nearest urgent care center. The inability to efficiently manage non-urgent cases has created unnecessary strain on hospital resources, contributing to the problem of overcrowding and prolonged patient wait times. This project aims to reduce the challenges faced in Houston Health Medical Center's ED by integrating a telehealth system into the organization's existing information technology (IT) system to triage and redirect low-priority cases to virtual ED consultations, thereby reducing patient wait times and overcrowding.

The proposed solution involves implementing the Amwell telehealth system, a virtual care platform offering on-demand and scheduled appointments. Through web, mobile, telephone, or kiosk access, patients can connect remotely with healthcare providers from various specialties to reduce unnecessary ED visits. This approach will triage cases appropriately and allow Houston Health Medical Center's ED staff to prioritize urgent cases requiring immediate in-person care. Utilizing Amwell's telehealth services will minimize congestion in the ED and ensure patients receive appropriate medical attention quickly.

In the following sections, we present literature supporting the effectiveness of telehealth in EDs, as well as the project integration, planning, and management. The literature outlines cases where overcrowding and prolonged patient wait times are due to increases in non-urgent ED cases and how IT solutions such as telemedicine can be

implemented in EDs to help triage and redirect low-priority cases to virtual ED consultations. This project will highlight how integrating telehealth into ED workflow can significantly reduce patient wait times and overcrowding.

2. Problem

2.1 Summary of Literature

Emergency department (ED) overcrowding and prolonged patient wait times are critical challenges impacting patient safety, staff well-being, and healthcare system efficiency. A significant contributor to this issue is the influx of non-urgent cases, which strains limited ED resources and leads to longer wait times for patients requiring critical care. Following the closure of a nearby urgent care center, Houston Health Medical Center experienced a 32% increase in non-urgent ED visits, highlighting the link between urgent care accessibility and ED utilization. Research by Allen and Hockenberry (2024) further supports this, showing that EDs in the same zip code as an urgent care facility report 17.2% fewer ED visits, demonstrating how alternate care access points can alleviate ED volumes (p. 724).

The consequences of overcrowding are well-documented. Mostafa and El-Atawi (2024) emphasize that overworked clinicians have limited time to dedicate to each patient, potentially compromising care quality (p. 4). Janke, Melnick, and Venkatesh (2022) found that approximately 10% of patients leave the ED without being seen due to excessive wait times (p. 2). These "left without being seen" (LWBS) cases are directly correlated with ED congestion and represent both a safety risk and a loss of healthcare resources. Studies have identified the high prevalence of non-urgent visits as a key driver of ED inefficiency. Alshurtan et al. (2024) reported that 78.5% of emergency visits in their sample were classified as non-urgent (p. 6), while Alnasser et al. (2023) found similar patterns, with 61.4% of 30,737 ED cases falling into

the non-urgent category (p. 230). These findings indicate a systemic misalignment between patient needs and ED resource allocation.

Telemedicine has emerged as a promising solution to this issue. By implementing a digital triage and consultation system, EDs can redirect low-priority cases to virtual care, preserving in-person resources for high-acuity patients. Jaffe et al. (2021) argue that using telemedicine to stratify patient flow improves efficiency, reduces unnecessary ED visits, and enhances overall care delivery (p. 9). Evidence shows that telemedicine improves operational metrics and maintains clinical effectiveness. Ahmed et al. (2024) concluded that diagnostic accuracy via telemedicine is comparable to in-person assessments, supporting its validity as a care delivery method (p. 473). At Houston Health Medical Center, implementing telehealth virtual consultations would allow non-urgent patients access remotely, freeing up physical space and reducing clinician workload during peak hours.

Additionally, telehealth addresses logistical barriers such as transportation, mobility limitations, and work-related time constraints. Patients can receive care from home or work, which increases access, reduces no-show rates, and enhances follow-up adherence. Tsou et al. (2021) documented the effectiveness of telehealth in rural and remote settings, noting that it expanded care access and improved patient outcomes (p. 9). This model could similarly benefit urban facilities like Houston Health Medical Center, especially in underserved neighborhoods.

Finally, studies show that patient satisfaction improves with the convenience and timeliness telehealth platforms offer. On-demand access and shorter wait times create a more positive patient experience, potentially improving engagement and outcomes (Ahmed et al., 2024, p. 474; Jaffe et al., 2021, p. 10). The literature strongly supports telemedicine as a strategic intervention to reduce ED overcrowding and long wait times. By implementing Amwell

telehealth for virtual consultations, Houston Health Medical Center's ED can reduce overcrowding and prolonged patient wait times.

2.2 Problem Statement

Non-urgent cases in the emergency department (ED) have increased by 32% following the closure of the nearest urgent care center. This increase has led to overcrowding and prolonged patient wait times in the ED. The ED does not have a workflow that quickly navigates the non-urgent cases causing overcrowding and prolonged patient wait times.

2.3 Review of Evidence and Key Findings

Table 1

Literature Review

Reference	Purpose	Methods	Key Findings
Ahmed et al. (2024)	To evaluate the purpose of telemedicine interventions in the emergency department (ED)	Systematic Review	• Telemedicine diagnostic accuracy was equivalent to in-person consultations (Telemedicine: 64.7%; In-person: 72.1%). • Telemedicine reduced readmission rates. • Telemedicine treatment times were significantly shorter than in-person ED treatment.

Allen & Hockenberry (2021)	To assess how urgent care centers impact ED use	Observational Study	• Emergency departments in the same zip codes as urgent care facilities had a 17.2% less ED visits when compared to their counterparts due to decreased patient visits for non-emergent cases.
Alnasser et al. (2023)	To examine the frequency, causes, and predictors of non-urgent ED visits to propose potential solutions	Retrospective Study	• 61.4% of 30,737 cases in ED were classified as less urgent or non-urgent. • Patients gravitate toward ED visits due to inaccessibility and need for same-day visits. • Authors recommended alternative care pathways for less urgent and non-urgent patients.
Alshurtan et al. (2024)	To evaluate the relationship between telemedicine and ED visits	Cross-sectional Study	• 78.5% of ER visits were classified as non-urgent. • 82.8% of patients believed telemedicine services could effectively manage non-urgent consultations.

Grant et al. (2020)	To assess ED length of stay and the rate of patients leaving without being seen	Systematic Review	• 80 of 94 studies reported modest improvements in ED throughput. • Most consistently effective interventions, reducing length of stay by 9 to 114 minutes. • Implementing fast track and optimizing care for key case-mix groups can enhance ED throughput.
Jaffe et al. (2021)	To evaluate telehealth initiatives in emergency care that emerged during the COVID-19 pandemic	Systematic Review	• Tele-triage and pre-hospital telehealth reduced unnecessary ED visits, improving patient flow and preventing overcrowding. • Post-discharge telehealth programs ensured continuity of care, reducing hospital readmissions and improving patient satisfaction. • Telehealth expanded specialist access for rural and under-resourced EDs, enabling remote consultations that improved patient outcomes.

Janke, Melnick & Venkatesh (2022)	To analyze the frequency of patients leaving the ED before clinical evaluation	Cross-sectional Study	• Overcrowding and Increased wait times in the Emergency departments (ED) led to up to 10% of patients leaving the ED without being seen.
Mostafa & El-Atawi (2024)	To evaluate ED structural performance, with an emphasis on reducing overcrowding, and identify strategies for improvement	Comprehensive Review	• Left without being seen rates are correlated with the issue of ED overcrowding. • Overworked physicians have limited time and attention to devote to each patient, leading to longer wait times. • Telemedicine reduced overcrowding, diagnosis and treatment times, wait times, and clinician workload (ED admission rates decreased from 19.4% to 17.5%).
Pearce et al. (2023)	To synthesize existing literature on the causes, impacts, and measurement of	Systematic Review	• Lack of access to non-urgent primary care centers is one of the system-level factors that leads to increased low acuity presentations in emergency

	ED crowding worldwide		departments thereby increasing overcrowding and prolonged wait times.
Tsou et al. (2021)	To evaluate the outcome measures used to assess the effectiveness of telehealth in rural and remote EDs	Systematic Review	• Telehealth in rural and remote EDs demonstrated equivalent or improved clinical effectiveness compared to in-person care. • Key outcome measures included transfer rates, discharge rates, local hospital admissions, and ED length of stay.

3. IT Solution

Amwell uses application programming interfaces to embed telehealth into the organization's existing EHR system. This enables healthcare organizations to provide virtual consultations for non-urgent emergency department visits. The system offers on-demand and scheduled appointments via web, mobile, telephone, or kiosk access for a wide range of specialties and patient cases. The Amwell telehealth platform will optimize the patient flow and divert non-emergency ED cases to virtual visits. Implementing telehealth into Houston Health Medical Center's existing IT system will redirect less urgent and non-urgent cases in the ED to reduce overcrowding and prolonged patient wait times.

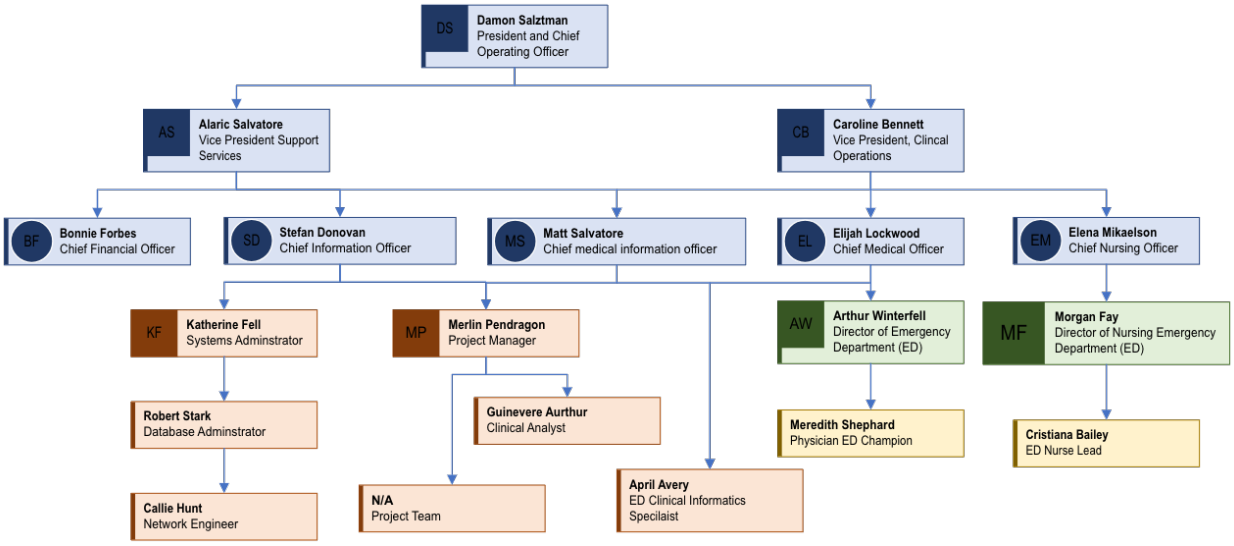
	THE IT SOLUTION

Problem Statement	Non-urgent cases in the ED have increased by 32% following the closure of the nearest urgent care center. This increase has led to overcrowding and prolonged patient wait times in the ED. The ED does not have a workflow that quickly navigates the non-urgent cases causing overcrowding and prolonged patient wait times.
Name of IT Solution	Telehealth System
Vendor Name	Amwell
Vendor Website (Direct web link to the solution)	https://patients.amwell.com/services/online-urgent-care
Description of the IT Solution	Amwell uses application programming interfaces to embed telehealth into the organization’s existing EHR system. This enables healthcare organizations to provide virtual consultations for non-urgent emergency department visits. The system offers on-demand and scheduled appointments via web, mobile, telephone, or kiosk access for a wide range of specialties and patient cases.
Purpose of IT Solution	The Amwell telehealth platform will optimize the patient flow and divert non-emergency ED cases to virtual visits. By facilitating the integration of telehealth with their existing IT system at Houston Health Medical Center's, the hospital has the capability of real-time triage to reduce overcrowding and patient wait times.

How will the solution resolve the problems/issues identified?	A telehealth system if implemented in the ED, can help triage and direct low-priority cases to virtual ED consultations, thereby reducing patient wait times and overcrowding.
How does the system or application relate to the problem?	Implementing telehealth into Houston Health Medical Center's existing IT system will redirect less urgent and non-urgent cases in the ED to reduce overcrowding and prolonged patient wait times. The integration will ensure reduced patient wait times and overcrowding.

4. Project Integration

4.1 The Organizational Chart



4.2 Dr. Alter System Snapshot

Work System Snapshot

Customers	Products and Services

• Patients with Non-Urgent Conditions – Redirected to virtual consultations for faster care without long ED wait times. • Emergency Department Healthcare Providers – Experience reduced congestion, allowing better focus on urgent cases. • Telehealth Providers – Conduct virtual consultations, evaluate non-urgent cases, and provide treatment or referrals. • Hospital IT Staff – Integrate and maintain the Amwell system within the existing EHR for seamless functionality. • Hospital Administration & ED Operations Managers – Oversee implementation, monitor system performance, and ensure efficiency.	1. Virtual ED Consultations – Non-urgent patients receive remote medical evaluations, reducing unnecessary in-person visits. 2. Triage & Patient Redirection – The system assesses case severity and directs low-priority cases to virtual care. 3. Amwell Telehealth Platform Integration – Seamlessly embedded into the hospital's EHR, enabling efficient virtual appointments. 4. On-Demand & Scheduled Appointments – Patients access virtual care via web, mobile phone, or kiosks. 5. ED Workflow Optimization – Reduces overcrowding, allowing ED staff to focus on critical cases. 6. Secure Data Management – Ensures patient records, consultations, and referrals are securely stored and accessible.
Major Activities or Processes	

- **Patient Accesses Telehealth Portal** – Patients with non-urgent conditions use web, mobile, phone, or kiosk to request a virtual consultation.
- **System Triage & Case Assessment** – The Amwell platform evaluates symptoms and determines if the patient should be treated virtually or requires in-person care.
- **Virtual Consultation with Telehealth Provider** – A licensed provider conducts a remote evaluation, prescribes treatment, or refers to the patient if necessary.
- **ED Workflow Optimization** – Non-urgent cases are redirected to telehealth, allowing ED staff to prioritize critical patients.
- **System Monitoring & Continuous Improvement** – Hospital administration and IT teams track performance, patient satisfaction, and system efficiency to refine processes.

Participants	Information	Technologies
• Patients • Telehealth Providers • Emergency Department Staff • Hospital IT Team • Hospital Administration & ED Operations Managers	• Patient Medical Records • Symptom & Triage Data • Virtual Consultation Notes • Appointment Scheduling Data • ED Patient Flow Metrics	• Amwell Telehealth Platform • Electronic Health Records (EHR) System • Web & Mobile Telehealth Applications • Telehealth Kiosks & Telephone Systems –

		Data Analytics & Monitoring Tools

Source: Steven Alter, *The Work System Method: Connecting People, Processes, and IT for Business Results,* Work System Press, 2006.

5. Project Scope Management

5.1 Scope Statement

The project aims to integrate the Amwell telehealth system into Houston Health Medical Center's existing IT infrastructure with the intention of addressing the rising issue of overcrowding and unnecessary waiting time within the emergency department (ED). The situation has been further worsened by a 32% increase in non-emergency cases following the closure of a nearby urgent care center. By using a telehealth consult, the hospital will be able to re-route low-priority cases to virtual appointments, leaving ED personnel to treat patients with exigent conditions.

The telehealth integration will provide functionality such as on-demand and scheduled virtual visits, real-time triage assessments, and secure integration with the hospital's electronic health record (EHR) system. The project will reduce ED workflow, minimize patient crowding, and enhance the efficiency of care provision through telemedicine technology. This project's scope involves integrating the Amwell telehealth system into Houston Health Medical Center's existing electronic health record (EHR) infrastructure to alleviate emergency department (ED) overcrowding and prolonged patient wait times by redirecting non-urgent cases to virtual consultations.

The integration will incorporate several key inclusions: incorporating the Amwell platform into the current EHR to facilitate seamless virtual consultations; implementing triage protocols to assess patient urgency and redirect non-urgent cases accordingly; contracting services for software integration to ensure compatibility with the hospital's IT systems; deploying multiple access points for telehealth services, including web-based, mobile, kiosk, and telephone consultations. Furthermore, hospital staff will receive comprehensive training on using the telehealth system, triage procedures, virtual consultation workflows, and patient data management.

This project scope excludes modifications to in-person consultation protocols or emergency care procedures. It will not involve significant upgrades to the current EHR system beyond what is necessary to support the Amwell integration, nor will it include procurement of additional hardware such as computers or tablets. Furthermore, the project will not entail the development of new software systems, relying solely on Amwell's existing platform and its compatibility with current systems. Long-term system maintenance after initial implementation is also outside the scope.

The project team makes several assumptions: that patients will be receptive to and actively utilize telehealth services for non-urgent conditions; that the existing IT infrastructure can support Amwell integration without major upgrades; that clinical staff will effectively adapt to the new workflows following appropriate training; and that telehealth will enhance ED efficiency without compromising care quality.

Constraints impacting the project include strict adherence to HIPAA and other healthcare regulations governing patient data privacy; a limited budget for IT integration, training, and telehealth platform licensing; potential resistance from stakeholders such as clinicians hesitant to transition to telehealth; and technical limitations, including

system downtime, cybersecurity risks, and connectivity issues.

The anticipated impact on stakeholders is multifaceted. Patients presenting with non-urgent conditions will benefit from faster, more convenient access to care via virtual visits, reducing wait times. Emergency department staff will experience less crowding and gain greater capacity to focus on critical cases. Telehealth providers will see increased volume and closer integration into hospital workflows. Hospital IT staff will manage system setup, support and troubleshooting, and maintenance during implementation. Lastly, hospital administrators and ED operations managers will benefit from improved operational efficiency, better resource utilization, and potential cost savings from reducing unnecessary in-person visits.

5.2 Requirements / Characteristics

The user requirements for the Amwell telehealth system are categorized into functional and non-functional requirements. The functional requirements include virtual consultations, triage and redirection, integration with the existing EHR system, secure data handling, and appointment scheduling. These requirements are the specific functionalities and features the Amwell telehealth system performs and ensure that the system meets quality, security, and usability standards. Virtual consultations, as well as triage and redirection, are crucial in reducing prolonged patient wait times and overcrowding by redirecting non-urgent cases to virtual consultations. Integration with the existing IT system and secure data handling focus on the system's core capabilities to ensure increased accessibility and comprehensive care with compliance with HIPAA privacy and security rules, informed consent, and quality of care standards.

The non-functional requirements include performance, clarity and understandability, reliability, feasibility, and gathering user requirements. These

requirements describe how the Amwell telehealth system performs rather than what it should do. Performance and reliability ensure that the system remains reliable and able to manage increased usage without compromising the proficiency and level of execution of the telehealth system. Clarity and understandability ensure that all stakeholders have a common understanding of the requirements to facilitate smooth implementation. Feasibility confirms the project is realistic and deliverable within the scheduled timeframe, budget, and available technology constraints. Lastly, gathering user requirements verifies a comprehensive understanding of user expectations through post-implementation surveys. Identifying these functional and non-functional requirements is crucial for project success and delivery.

- **Functional Requirements:**
    - Virtual Consultations
    - Triage and Redirection
    - Integration with Existing IT System
    - Secure Data Handling
    - Appointment Scheduling
- **Non-Functional Requirements:**
    - Performance
    - Clarity and Understandability
    - Reliability
    - Feasibility
    - Gathering User Requirements

Desired Functionality	Existing Functionality	Change / New	Justification for the Desired Functionality	Stakeholders / Business impacted	Priority
Virtual Consultations	None	New	Enable synchronous and asynchronous video consultations for patients with non-urgent conditions to receive real-time or scheduled medical care remotely via video, phone, or web, decreasing physical ED visits and improving patient access. Supports diagnosis, prescription, referral, and follow-up care. Incorporates high-definition video, secure messaging, and documentation templates directly into the EHR.	Patients, ED staff	High
Triage and Redirection	Limited	Change	Automate triage protocols that classify cases by urgency and redirect non-urgent patients to telehealth platforms. Integrates	Patients, ED staff	High

			symptom checkers and red flag alerts for urgent escalation. Ensures appropriate routing of patients to either virtual or in-person care based on acuity levels. Reduces bottlenecks and facilitates efficient ED throughput.		
Integration with Existing IT System	Partial	New	Create seamless bi-directional integration with EPIC EHR. Ensures real-time syncing of patient demographics, visit notes, prescriptions, diagnostic codes, and provider schedules. Facilitates centralized data access, billing automation, and unified clinical records.	IT staff, ED staff	High
Secure Data Handling	Existing/Limited	Change	Implement end-to-end encryption, role-based access controls, and audit logs to secure sensitive data during	Patients, Compliance officers, IT staff	High

			telehealth sessions and ensure HIPAA compliance.		
Appointment Scheduling	Limited	Change	Provide intuitive, multilingual self-scheduling interface with real-time availability, automated confirmations, reminder alerts via SMS/email, and cancel/reschedule functions. Integrates with EHR calendars to reduce double-booking and streamline resource allocation.	Patients	High
Performance	Limited	New	Ensure the system maintains uptime of ≥ 99.9%, must handle 100+ concurrent sessions without lag, and sustains telehealth session quality with minimal latency and interruptions. Built-in monitoring dashboards to track bandwidth usage, system load, and call quality. Automatically	Patients, ED staff	High

			scale cloud resources during peak usage times.		
Clarity and Understandability	Limited	New	Produce requirements and user specifications in plain language for both technical and clinical audiences. Includes annotated diagrams, workflow maps, and FAQs to ensure alignment across project teams, users, and vendors. Provide shared documentation to ensure alignment across stakeholders.	Patients, ED staff, IT staff	High
Reliability	Limited	New	Build redundancies and system failover protocols to minimize downtime. System should recover from outages quickly and ensure service continuity during outages through offline access options and incident response protocols.	Patients, ED staff	Medium

Feasibility	None	New	Conduct technical and financial feasibility assessments to ensure technical compatibility, licensing costs, and workflow alignment. Confirm system can be deployed within 6 months, using existing server infrastructure and allocated budget.	Patients, ED staff, IT staff	High
Gathering User Requirements	None	New	Collect user feedback through structured surveys, usability testing, and post-implementation assessments to refine the system based on real-world user needs. Translate insights into actionable feature requests, training content, and usability enhancements.	Patients, ED staff	Medium

5.3 Acceptance Criteria

The project success criteria evaluate the effectiveness of integrating the Amwell telehealth system into Houston Health Medical Center's existing IT system to ensure

that the project successfully reduces patient wait times and overcrowding in the ED. The project success criteria include scope fulfillment, quality standards, budget adherence, time delivery, stakeholder satisfaction, achievement of business objectives, sustainability and impact, compliance and regulatory approval, risk management, and user training and adoption. These criteria are SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) to provide common objectives for assessing project outcomes and making informed decisions throughout the project lifecycle.

Scope fulfillment ensures the project is delivered without unnecessary scope creep, measured by completing all defined tasks. Quality of standards ensures the project meets quality requirements, measured by user acceptance of more than 90% error-free functionality. Budget adherence ensures the project is within the allocated budget, measured by comparing actual costs to the approved budget with a variance of less than 5%. Time delivery ensures adherence to the schedule described in the Gantt chart (Section 6.1) with less than 10% delay. Stakeholder satisfaction will report satisfaction rates with the Amwell telehealth system's usability and performance, measured by post-implementation surveys reporting a more than 80% satisfaction rate. Achievement of business objectives focuses on reduced wait times and overcrowding by redirecting non-urgent cases to Amwell telehealth virtual consultations, measured by the decrease in non-urgent ED visits and reduction in average wait times by 30% within 6 months of implementation. Sustainability and impact ensure the continuous/ongoing usage of virtual consultations, measured by maintaining a usage rate of more than 70% after one year. Compliance and regulatory approval assuring compliance with HIPAA privacy rules, HIPAA security rules, state licensure laws, informed consent, confidentiality of communication channels, documentation requirements, and quality of

care standards, measured by successful compliance audits. Risk management will ensure the effective identification, management, and mitigation of risks identified throughout the project and will also minimize the likelihood of disruptions during/after implementations, measured by resolution of risks post-implementation. Lastly, user adoption and training will ensure the efficient usage by ED staff and the staff's ability to provide adequate instruction to patients with minimal support, measured by users' ability to demonstrate proficiency within 30 days of post-implementation and training. These success criteria will allow the project team to make informed decisions and adjust strategies to make appropriate improvements or changes to guarantee the success of the Amwell telehealth system implementation.

Project Success Criteria
1. **Scope Fulfillment:** Virtual consultations, EHR integration, and secure data handling are delivered without unnecessary scope creep. a. Completion of all tasks defined.
2. **Quality Standards:** Amwell telehealth system meets quality requirements to ensure seamless and error-free user experience in terms of functionality, easy navigation, and system performance. a. Exceeds stakeholder expectations. b. User acceptance with >90% error-free functionality.
3. **Budget Adherence:** Project is completed within the allocated budget. a. Comparison of actual costs to approved budget with a variance <5%.

4. **Time Delivery:** All phases of implementation and integration are completed on or before deadlines.
    a. Adherence to schedule described in Gantt chart (Section 6.1) with <10% delay.
5. **Stakeholder Satisfaction:** Patients, ED staff, project team members, and sponsors report satisfaction with Amwell telehealth system's usability and performance.
    a. Post-implementation surveys report >80% satisfaction rate.
6. **Achievement of Business Objectives:** Reduced ED wait times and overcrowding by redirecting non-urgent cases to Amwell telehealth virtual consultations.
    a. Decrease in non-urgent ED visits and reduction in average wait times by 30% within 6 months.
7. **Sustainability and Impact:** Continuous/ongoing usage of Amwell telehealth virtual consultations.
    a. Maintain a usage rate of >70% one-year post-implementation.
8. **Compliance and Regulatory Approval:** Compliance with HIPAA privacy rule, HIPAA security rule, state licensure laws, informed consent, confidentiality of communication channels, documentation requirements, and quality of care standards.
    a. Successful compliance audits.
9. **Risk Management:** Effective identification, management, and mitigation of risks identified through the project. Minimize likelihood of disruptions during/after implementations.
    a. Resolved all high-priority risks before project completion.

10. **User Training and Adoption:** ED staff can use the system efficiently and provide adequate instruction to patients with minimal support.
    a. Users demonstrate proficiency within 30 days of post-implementation and training.

5.4 Project Deliverables

The key project deliverables are the tangible outcomes required to successfully implement the Amwell telehealth system in Houston Health Medical Center's ED. These deliverables include integration, security framework, technical support plan, virtual consultation setup, training manuals, user training sessions, usage reports, compliance documentation, project closure report, and performance evaluation. The project aims to facilitate a smooth transition for ED staff with successful deployment and integration of the system.

The key deliverables are designed to enhance efficiency in the ED and focus on ensuring long-term sustainability and performance. The first deliverable (Amwell telehealth system integration) focuses on system integration. The second deliverable (security framework) focuses on secure data handling and security protocols. The third deliverable (technical support plan) requires the development of documentation that includes support procedures and protocols for troubleshooting. The fourth deliverable (virtual consultation setup) is configuring user setup, access, and virtual consultation workflows. The fifth deliverable (training manuals) is creating an instruction manual and/or video to train ED staff and patients on using the Amwell telehealth system. The sixth deliverable (user training sessions) includes the process for conducting training sessions. The seventh deliverable (usage reports) includes reports on user rates and

user feedback. The eighth deliverable (compliance documentation) verifies the adherence to HIPAA privacy rule, HIPAA security rule, state licensure laws, informed consent, confidentiality of communication channels, documentation requirements, and quality of care standards. The ninth deliverable (project closure report) details project outcomes and success metrics. The tenth deliverable (performance evaluation) includes reports measuring the Amwell telehealth system's uptime/downtime, response times, and user feedback. Clearly defining these key project deliverables allows the project team to demonstrate the significance of telehealth in managing prolonged patient wait time and overcrowding in Houston Health Medical Center's ED.

Key Project Deliverables
1. **Amwell Telehealth System Integration:** Full deployment and integration of the Amwell platform with the hospital's existing EPIC EHR. This includes single sign-on (SSO) configuration, real-time data synchronization for patient records, scheduling modules, visit documentation, and billing functions. Success is measured by interoperability testing, clinical validation, and go-live readiness sign-off.
2. **Security Framework:** Establishment of a robust security infrastructure ensuring end-to-end encryption, multifactor authentication (MFA), user role definitions, audit trails, and data access controls. Includes development of a cybersecurity incident response plan and completion of pre-deployment security audits aligned with HIPAA, HITECH, NIST, and ISO 27001 standards. Must pass internal and external compliance reviews.
3. **Technical Support Plan:** Creation of a comprehensive, tiered technical support model. Documentation includes escalation paths, ticketing procedures, contact protocols,

service level agreements (SLAs), downtime response, and post-implementation support responsibilities. Includes knowledge base articles and video tutorials for quick troubleshooting.
4. **Virtual Consultation Setup:** Design and configuration of virtual consultation workflows for different user types (e.g, patients, physicians, nurses). Tasks include telehealth room configuration, user credentialing, device testing (kiosks, tablets), clinical protocols for remote care, and integration with patient portals. Must support video/audio streaming, secure messaging, and e-prescription features.
5. **Training Manuals:** Development of printed and digital training materials for ED staff, physicians, administrative users, and patients. Manuals include system overviews, role-specific use cases, annotated screenshots, FAQs, error-handling guidance, and quick-start guides. Must be accessible in multiple formats (PDF, video) and comply with readability and accessibility standards.
6. **User Training Sessions:** Conducting structured in-person and virtual training programs tailored to each user group (e.g., nurses, ED physicians, IT staff). Includes competency assessments, role-play simulations, and pre/post-training evaluations. Training calendar and attendance logs must be maintained. Follow-up refresher sessions to be offered biweekly during first 60 days post-go live.
7. **Usage Reports:** Generation of weekly/monthly reports that monitor platform adoption, usage trends, wait times, appointment volumes, user satisfaction, and technical performance metrics. Dashboards to include KPIs such as percentage of patients

redirected to virtual visits, system uptime, and error rates. Used to guide continuous improvement and stakeholder reporting.
8. **Compliance Documentation:** Compilation of required legal and regulatory documentation including HIPAA risk assessments, informed consent templates, data transmission logs, staff attestation forms, privacy notices, audit logs, and telehealth-specific policies. Required for accreditation, legal protection, and reporting to oversight bodies.
9. **Project Closure Report:** A comprehensive report summarizing project scope, timeline, milestones, budget performance, risk outcomes, key lessons learned, stakeholder feedback, and success metrics. Includes go/no-go decision history, change requests, and confirmation of deliverable completion. Serves as a formal closeout document for governance review.
10. **Performance Evaluation:** Detailed technical performance analysis of the system over 90 days post-launch. Measures include uptime percentage, call quality metrics, load times, user response times, system error frequency, and help desk ticket resolution time. Includes user satisfaction survey summaries and recommendations for system optimization or vendor escalation.

5.5 SWOT Analysis

INTERNAL FACTORS	
STRENGTHS (+)	**WEAKNESSES (-)**

• **Reduced wait times and overcrowding in the ED:** The telehealth system allows non-urgent patients to be triaged and redirected to virtual consultations, freeing up physical space and clinical resources for critical cases. This enhances the overall throughput and reduces the burden on ED staff, improving care delivery for time-sensitive emergencies. • **Houston Health Medical Center's existing IT supports Amwell integration:** Houston Health Medical Center already operates a modern EHR system with modular capabilities, reducing the need for extensive technical overhauls. This streamlines the integration process, lowers costs, and expedites project timelines. • **Strong commitment from ED staff to reduce prolonged patient wait times and overcrowding:** The	• **Resistance to change from clinical and administrative staff:** Shifting workflows to new digital systems often causes anxiety and pushback. Staff may be reluctant to use unfamiliar tools or feel that telehealth devalues in-person care. Without proper change management, adoption may be delayed or inconsistent. • **Limited budget for ongoing maintenance and licensing:** While the project may be initially funded, recurring costs such as software licenses, technical support, and system updates require sustained financial commitment. Budget limitations could jeopardize long-term functionality or force feature reductions. • **Not all patients have reliable internet or devices:** Low-income and rural patients may lack smartphones, tablets, or high-speed

culture of the ED staff reflects a strong sense of responsibility for addressing overcrowding and inefficiencies. • **Experienced IT staff capable of operating system deployment:** The in-house IT team has prior experience with clinical application rollouts, enhancing the team's ability to implement the Amwell platform with fewer technical disruptions or dependence on third-party consultants. • **Remote appointment accessibility:** Patients can engage in care from home or work, removing logistical barriers like transportation, wait times, and time off work. This accessibility increases service utilization among populations who may otherwise avoid care. • **Reduces risk of exposure to contagious diseases:** Minimizing	internet, hindering their ability to use telehealth services and potentially worsening disparities in care access. • **Clinical limitations of virtual consultations:** Some medical conditions, such as those requiring physical examination, lab tests, or imaging, cannot be adequately addressed through telehealth. This constraint limits the scope of cases that can be managed virtually and requires clear triage protocols. • **Need for regular training and retraining:** Continuous staff education is required due to system updates, onboarding of new hires, or evolving workflows. This creates a resource burden in terms of time, scheduling, and training coordination, which may temporarily disrupt daily operations. • **Licensing fees and platform costs:** Additional costs for Amwell

in-person visits helps prevent the spread of illnesses like COVID-19 or influenza, protecting both staff and patients. • **Improved patient engagement and satisfaction:** On-demand access, shorter wait times, and user-friendly platforms result in higher patient satisfaction and potentially better adherence to treatment plans, especially for chronic or recurring conditions. • **Avoids unnecessary patient travel:** Particularly beneficial for elderly, disabled, or rural patients. Alleviates physical and financial burdens, such as gas costs, parking, and mobility-related challenges. • **Potential to increase follow-up visit rates:** Patients may be more likely to complete follow-up appointments due to the convenience of virtual care, which	licenses, user accounts, third-party tools, and compliance audits can accumulate over time. • **Patient internet speed/connectivity issues:** Patients may experience dropped calls, poor video quality, or connectivity failures, which can disrupt care delivery, cause dissatisfaction, and require rescheduling, which may negatively affect provider productivity and patient trust.

can lead to better health outcomes and reduced hospital readmissions. • **Enhanced access to care for underserved populations:** Telehealth bridges geographical and physical barriers, enabling more equitable care access, particularly in communities lacking urgent care facilities or specialty services.	

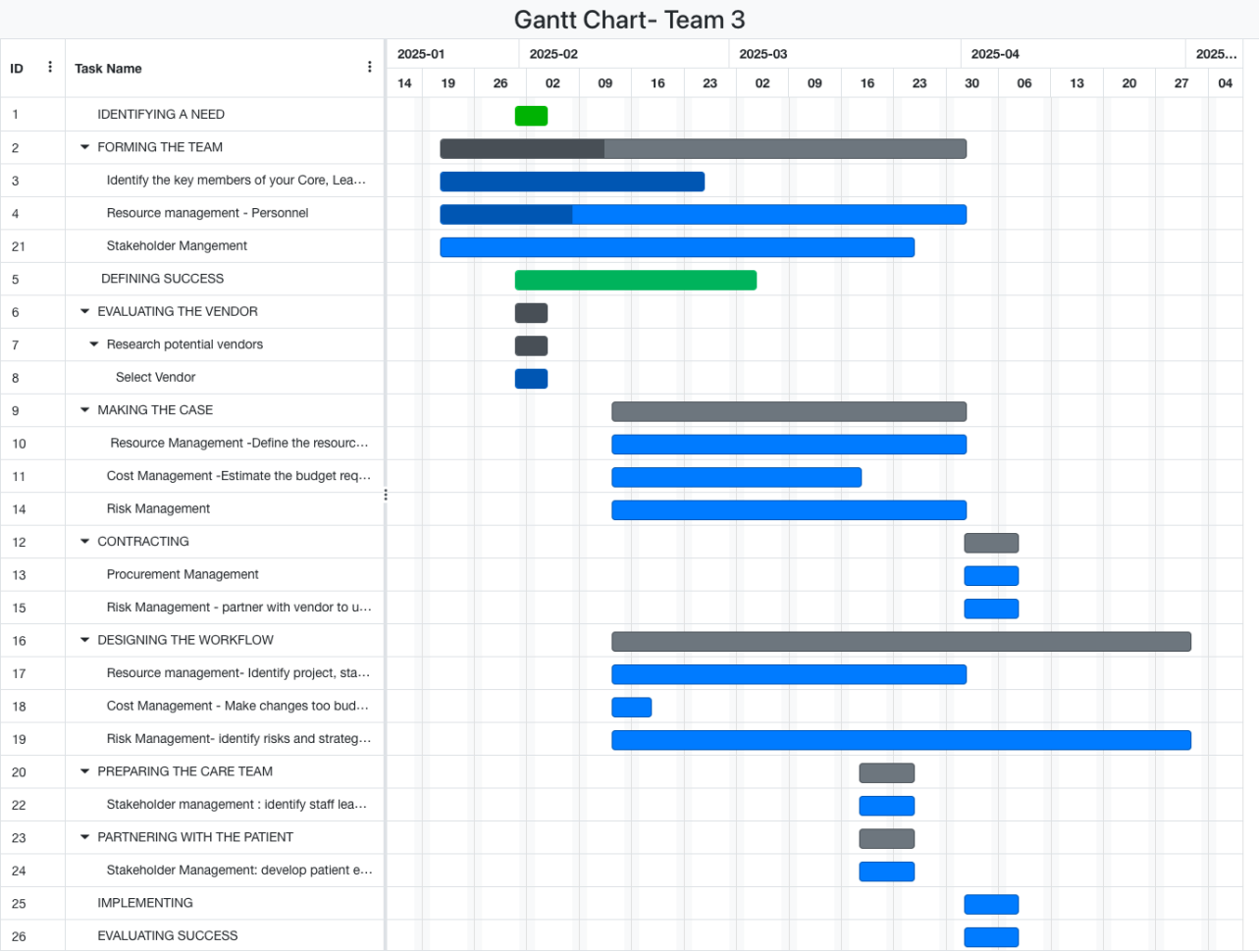
EXTERNAL FACTORS	
OPPORTUNITIES (+)	**THREATS (-)**
• **Broader patients reach through digital access:** Fro • **Increased care access for mobility-restricted patients:** Individuals with disabilities, chronic illnesses, or transportation barriers gain access to medical evaluations without the physical and psychological strain of visiting the ED in person. • **Improved efficiency across clinical workflows:** By diverting	• **Cybersecurity and data privacy risks:** With increased use of online platforms, the risk of data breaches, ransomware attacks, or HIPAA violations rises. Any incident can damage the hospital's reputation, invite legal scrutiny, and compromise patient trust. • **Competitive pressure from other telehealth providers:** Large commercial vendors offer similar services directly to consumers,

non-urgent cases, clinicians can devote more time and attention to high-priority patients. Triage becomes faster, and overall patient throughput improves, optimizing staffing and resource allocation. • **Scalability to other departments:** Successful ED implementation opens the door to rolling out telehealth services in other areas enabling enterprise-wide digital transformation. • **Adoption by other regional facilities:** If proven effective, the model can be shared with or licensed to other EDs within the healthcare system or region, promoting consistency and collaboration. • **Rising patient demand for telehealth:** Post-COVID-19, patients increasingly expect remote care options. Meeting this demand	potentially diverting patients away from the hospital's virtual care option unless clear value and integration are demonstrated. • **Technical issues during high patient volume:** System crashes, slow load times, or service interruptions during peak hours can disrupt clinical workflows, and delay care. High availability infrastructure is essential but costly. • **Patient preference for traditional in-person visits:** Some populations, especially older adults or those less familiar with technology, may be hesitant to use virtual care, potentially reducing adoption.

improves public perception and increases satisfaction.	

6. Project Schedule Management

6.1 Schedule Development - Gantt Chart



Based on American Medical Association & American Medical Association, *Telehealth Implementation Playbook planning,* American Medical Association, 2021.

6.2 Schedule Control

- **Review Schedule Baseline**: Track project progress using the Gantt Chart. Use the schedule to identify tasks and due dates.
- **Perform Schedule Management**: Weekly schedule review and update meeting
- **Monitor the Schedule**: Use task-completion tracking to update the Gantt chart. Ensure all tasks have status not started, in progress, or completed
- **Review Scope Baseline**: Review scope before beginning tasks and after the task to ensure adherence
- **Work Performance Data**: Collect work progress data throughout the project
- **Resource optimization**: Ensure resource personnel are appropriately scheduled and review the resource schedule biweekly. Reallocate resources as needed. Create a communication chain for changes.
- **Leads and Lags Adjustment:** Modify tasks based on limitations and setbacks in tasks
- **Trend analysis:** Identify patterns in tasks that may create setbacks or limitations
- **Change management process:** Create and communicate a structured approach for change requests that impact the schedule
- **Communication and reporting:** Establish biweekly communication with stakeholders. Ensure the Gantt chart is on display. Perform weekly status updates

7. Project Cost Management

7.1 Cost Estimation

The cost estimation of the project was built upon a Total Cost of Ownership

(TCO) model comprising one-time implementation costs, along with ongoing operations costs for a period of five years (2022–2026). The estimation process began by identifying significant cost factors, including vendor fees for software licensing and hardware acquisition, implementation costs for system installation and integration, and recurring operational expenses such as maintenance, technical support, and software upgrades. The estimates for costs were obtained through vendor quotations, industry benchmarks, and past IT implementations within comparable healthcare settings. The pricing structure was closely examined, balancing subscription-based models and one-time licensing fees to determine the most cost-effective approach. A five-year projection was established to enable an orderly financial forecast, splitting the costs into fixed and variable components while providing potential risk adjustments for variables like regulatory modifications or software upgrades. By utilizing this approach, the project team delivered financial viability and transparency, allowing stakeholders to make effective budgetary decisions on the deployment of the IT solution.

7.2 Budget Control

Several budget control measures will be implemented throughout the project lifecycle to ensure the project remains within budget. First, the Project Finance Team will be responsible for budget tracking and utilization to conduct variance analyses for monthly budget reviews to compare actual expenses to the allocated budget. The Financial Analysts will monitor real-time expenditures to ensure transparency and allow early identification of potential budget overruns to generate cost variation reports that identify cost deviations exceeding 5%. The Project Management and Finance Teams will initiate corrective actions to realign spending within the approved budget. Second, the Project Team will enforce a structured expense approval process. Any expense

beyond the approved budget will require formal review and approval by the Project Management Team, Finance Team, and Executive Stakeholders before the funds are authorized. Third, a 10% contingency fund will be budgeted to cover unexpected costs or emergencies, with strict guidelines established to prevent misuse and limit access only for unforeseen circumstances. Fourth, the Change Control Board will strictly evaluate any modifications to the project scope, which will require approval through the Change Management Process to prevent scope creep and avoid unexpected financial burdens. Fifth, vendor cost management will include fixed-price contracts to reduce the risk of budget overruns, and service level agreements (SLAs) to ensure predictable and controlled expenditures and avoid scope creep. Sixth, the Operations Teams will optimize resource allocation, equipment allocation, and workforce scheduling to prevent unnecessary expenses, minimize redundant spending, and avoid overtime and excessive labor costs. Seventh, the Financial Analysts with Executive Stakeholders will conduct cost-benefit analyses before any significant financial commitments to ensure financial feasibility and that all expenditures align with the project's success criteria and return on investment (ROI). Eighth, the Auditors and the Finance Team will conduct monthly financial audits to ensure compliance with the budget and create detailed financial reports highlighting budget adherence or any necessary adjustments to share with Executive Stakeholders to maintain accountability. Integrating these eight budget control strategies will maintain financial discipline throughout the project lifecycle to ensure successful execution within the allocated resources.

7.3 Cost Analysis Worksheet

Houston Health Medical Center

Optimizing Emergency Department Efficiency Through Telehealth Integration

Proposed 5 Year Total Cost of Ownership (TCO)

2022-2026

Vendor Cost	One-time Fees	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Licensed Software	$350,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000	**$12,850,000.00**
Sublicensed Software	$500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	**$8,000,000.00**
Subscriptions	$500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	**$8,000,000.00**
Professional Fees	$300,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	**$10,300,000.00**
Remote Hosting Fees	$150,000	$1,200,000	$1,200,000	$1,200,000	$1,200,000	$1,200,000	**$6,150,000.00**
Installation Fees	$200,000	$500,000	$500,000	$500,000	$500,000	$500,000	**$2,700,000.00**

Support/Maintenance Fees	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	**$2,500,000**
Go-live Support Fees	$300,000	$300,000	$300,000	$150,000	$150,000	$150,000	**$900,000**
Travel/Hotel to Client Site	$50,000	$125,000	$125,000	$125,000	$125,000	$125,000	**$625,000**
Other Fees	$75,000	$250,000	$250,000	$250,000	$250,000	$250,000	**$1,325,000.00**
Organizational Cost	**One-time Fees**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Hardware	$500,000	$1,000,000	$500,000	$500,000	$500,000	$500,000	**$3,500,000.00**
Build/Backfill Teams	$400,000	$800,000	$800,000	$800,000	$800,000	$800,000	**$4,400,000.00**
Go-live Support Team	$300,000	$600,000	$600,000	$600,000	$600,000	$600,000	**$3,300,000.00**
Training	$350,000	$700,000	$700,000	$700,000	$700,000	$700,000	**$3,850,000.00**

Travel/Hotel	$100,000	$250,000	$250,000	$250,000	$250,000	$250,000	**$1,350,000.00**
Other	$150,000	$300,000	$300,000	$300,000	$300,000	$300,000	**$165,000.00**
Vendor Total	**$2,225,000**	**$10,700,000.00**	**$10,700,000**	**$10,700,000**	**$10,700,000**	**$10,700,000**	**$55,725,000.00**
Organizational Total	**$1,800,000**	**$3,350,000.00**	**$2,850,000**	**$2,850,000**	**$2,850,000**	**$2,850,000**	**$16,550,000.00**
Taxes	$332,062.50	$1,159,125.00	$1,117,875.00	$1,117,875.00	$1,117,875.00	$1,117,875.00	**$5,962,687.50**
Grand Total	**$4,357,063**	**$15,209,125.00**	**$14,667,875**	**$14,667,875**	**$14,667,875**	**$14,667,875**	**$78,237,687.50**

Organizational Cost Estimated Cost Breakdown (Year 1)			
Hardware	**Quantity**	**Unit Cost**	**Total**

Scanner	45	$2,500	**$112,500**
Computer	100	$2,000	**$200,000**
Other Device (Work Phone, etc.)	125	$1,200	**$150,000**
Sub Total	**270**	**$-**	**$462,500**
Backfill/Build Teams	**No. of Required Build Hrs**	**Rate per hr**	**Total**
RN	5,000	$50.00	**$250,000**
IT	4,000	$60	**$240,000.00**
Other Clinical Staff	3,500	$45.00	**$157,500.00**
Other Staff	3,000	$35.00	**$105,000.00**
Sub Total	**15,500**	**$190.00**	**$502,500.00**
Go-live Support Team	**No. of Support Hrs**	**Rate per hr**	**Total**
RN	2500	$50.00	**$125,000.00**
IT	2000	$60.00	**$120,000.00**
Super User	1500	$45.00	**$67,500.00**
Other Clinical Staff	2000	$45.00	**$90,000.00**
Other Staff	1500	$30.00	**$45,000.00**
Sub Total	**9500**	**$230.00**	**$447,500.00**

Training	**No. of Persons / Items**	**Rate per hr**	**Total**
Training Material	500	$50.00	**$25,000.00**
Training Instructors	5	$100.00	**$500.00**
Training Staff	10	$60.00	**$600.00**
Training - Other	5	$55.00	**$275.00**
Sub Total	**520**	**$265.00**	**$26,375**
Travel/Hotel	**No. of Persons/Items**	**Unit Cost**	**Total**
Airfare	20	$600.00	**$12,000.00**
Hotel Nights (5 days, 1 per room)	100	$150.00	**$15,000.00**
Meals per day (5 days x no of persons)	100	$75.00	**$7,500.00**
Other Travel Needs	0	$10,000.00	**$-**
Sub Total	**220**	**$10,825.00**	**$34,500.00**
Other	**No. of Persons/Items**	**Unit Cost**	**Total**
Other -Licensing & Compliance Fees (HIPAA, cybersecurity audits)	1	$50,000.00	**$50,000.00**
Other - Custom Software Modifications (additional features requested by hospital)	1	$75,000.00	**$75,000.00**

Other - Additional Equipment & Office Supplies (headsets, monitors, furniture, etc.)	50	$500.00	**$25,000.00**
Sub Total	**52**	**$1,255,000.00**	**$150,000.00**

8. Project Quality Management

8.1 Quality Management Plan

Houston Health Medical Center

Quality Management Plan

March 2025

Optimizing Emergency Department Efficiency Through Telehealth Integration

Prepared by:	Alejandro Garcia, Ciara-Lyn Lee, Hetty Udeh (Group 3)
Date (MM/DD/YYYY):	03/18/ 2025

1. Deliverables and Acceptance Criteria	
Deliverables	**Acceptance Criteria / Applicable Standards**
1. **Amwell Telehealth System Integration**	The Amwell platform must integrate seamlessly with existing Electronic Health Record (EHR) systems, enabling secure data exchange and uninterrupted video/audio

	quality. The IT team should ensure that the data transmission is encrypted in compliance with HIPAA and that interoperability follows HL7 and FHIR standards. Integration must meet the security benchmarks outlined in the NIST Cybersecurity Framework.
2. **Security Framework**	The IT team must ensure Compliance verification, encryption standard, Business Associate Agreements, verification procedures are met. Security compliance must align with NIST SP 800-53, ISO 27001, and the HIPAA Security Rule.
3. **Technical Support Plan**	The plan must outline service-level agreements (SLAs), provide clearly defined escalation procedures, and include documentation for troubleshooting and maintenance. The framework should adhere to ITIL, ISO 20000, and NIST SP 800-184 standards.
4. **Virtual Consultation Setup**	The consultation feature must support scheduling, role-based functionality, and stable, high-quality video and audio communication across various devices and

	user roles. Accessibility must follow WCAG 2.1, and compliance with HIPAA .
5. **Training Manuals**	Manuals must offer clear, comprehensive guidance on using all features of the system. They must be written in plain, user-friendly language and reviewed for accuracy. They must contain the complete Instruction manual and/or video for training ED staff and patients on using all features of Amwell telehealth system.
6. **User Training Sessions**	All users must successfully complete training modules. Knowledge retention must be assessed through post-training evaluations, and participant feedback should be used for continuous improvement.
7. **Usage Reports**	Reports must accurately reflect system usage metrics (e.g., number of consults, average duration, uptime), be generated within defined timeframes, and be presented in a clear and actionable format.
8. **Compliance Documentation**	The project must maintain thorough documentation of all legal and regulatory requirements, including audit logs and policy

	manuals. All reports should adhere to HIPAA privacy rule, HIPAA security rule, state licensure laws, informed consent, confidentiality of communication channels, documentation requirements, and quality of care standards are documented. All audits passed.
9. **Project Closure Report**	The final report must summarize project scope, deliverables, performance metrics, and lessons learned, with formal stakeholder approval. Documentation should align with PMI PMBOK, best practices.
10. **Performance Evaluation**	The system must meet defined KPIs, with user satisfaction measured through surveys and technical performance evaluated against benchmarks

2. Quality Assurance Activities

- What steps will you take to ensure that Quality is built into the production processes?

The project team will implement a structured and proactive testing framework to ensure quality is embedded throughout production. This framework will consist of unit testing, integration testing, user acceptance testing (UAT), and comprehensive security compliance checks. Unit testing will be used to verify the functionality of individual components, such as the triage algorithm and appointment scheduling modules. Integration testing will confirm that all system components work together seamlessly. UAT will involve real clinical users (ED staff, IT team members, and administrative personnel) to validate that the system meets technical and clinical expectations. Additionally, systematic security audits will assess compliance with HIPAA and cybersecurity standards. Regular stakeholder reviews will ensure deliverables align with user needs and project goals. Documentation such as the Requirements Traceability Matrix (RTM) will be maintained to track alignment between functional requirements, technical specifications, and test cases. Quality checkpoints will be embedded into the project timeline to validate progress and trigger early corrective actions when necessary.

- Will the test team work from a Test Plan? Do they understand their responsibilities?

The project team will conduct structured review sessions with stakeholders, including ED clinicians, IT staff, hospital administrators, and compliance officers, to validate that all requirements are correct and complete. During these sessions, requirements documents will be reviewed line-by-line to verify alignment with clinical workflows, technical capabilities, patient privacy expectations, and operational goals. Any discrepancies, omissions, or vague specifications will be revised based on stakeholder input. Additional validation will be gathered

through user feedback from workflow mapping exercises, interviews, and surveys. These activities will ensure that requirements are technically feasible and contextually relevant to the hospital's emergency department environment.

- How will you ensure that Requirements are correct, complete and accurately reflect the needs of the Customer?

Sessions will be scheduled with stakeholders for documentation review to validate requirements.

- How will you verify that Specifications are an accurate representation of the Requirements?

Specifications will be verified through a two-step process involving peer reviews and formal validation testing. First, technical and clinical leads will participate in peer review sessions to examine whether the specifications fully and accurately reflect the documented requirements. Second, validation testing will be conducted using controlled test environments and real-world scenarios to confirm that the specified functionalities perform as expected. Any gaps between the requirements and implemented features will be documented, tracked in the RTM, and resolved through iterative refinements before deployment.

- What steps will you take to ensure that the project plan (e.g. Risk Management Plan, Change Management Plan, Procurement Plan) is followed?

The team will incorporate regular quality checkpoints into the project timeline to ensure adherence to all project plan components. These checkpoints will be formal reviews to assess whether key deliverables meet predefined standards and align with the Risk Management, Change Management, and Procurement Plans. Audits will be scheduled at major project

milestones: during initial system configuration, pre-deployment readiness assessment, and post-deployment evaluation. Project leads will maintain detailed documentation of all plan components and use change logs to record any deviations or updates. These controls will help ensure that scope, schedule, cost, and quality standards align throughout the project lifecycle.

- Describe how *Requirement – Specification – Test Plan* traceability is managed (or provide **Link_To_ Requirements_Traceability_Matrix**):

The team will manage traceability through a centralized Requirements Traceability Matrix (RTM). This RTM will map each requirement to its corresponding specification, associated test cases, and final validation status. The team can verify that each requirement is documented, implemented, and successfully tested by maintaining this linkage. The RTM will be updated regularly and audited before going live to confirm full coverage and compliance. This approach ensures transparency, accountability, and alignment between the customer's expectations and the delivered solution.

Requirements Traceability Matrix (RTM).xlsx

- What audits and reviews are required and when will they be held?

First, a system setup audit will be held before deployment to verify infrastructure readiness, data integration, and security controls. Second, a compliance and security audit will be conducted before go-live to ensure that all HIPAA, cybersecurity, and regulatory requirements have been met. Third, a post-deployment performance review will be held within 30 to 60 days after go-live to evaluate technical performance, clinical usability, and user satisfaction.

Each audit will include a review of documentation, interviews with stakeholders, and an examination of system logs and reports.

- What steps will you take to ensure that the Vendor is supplying deliverables of adequate quality?

The project team will define and enforce detailed Service Level Agreements (SLAs) that outline performance standards, uptime guarantees, and response times for support requests. Quality assurance inspections of vendor deliverables will be conducted at each milestone, after integration testing, and before going live. The team will also perform vendor audits to evaluate development practices, documentation quality, and security compliance. Feedback will be collected from internal users to assess vendor responsiveness and performance. Any deficiencies will be documented and addressed through the escalation procedures defined in the SLA.

- What will you measure to determine if the project is out of Scope?

Variance analysis will be performed by comparing planned and actual deliverables, track change requests and scope creep incidents, and conduct regular scope reviews with stakeholders. A formal change control log will track scope creep incidents, such as requests for unapproved features, additional hardware, or expanded training. Regular scope reviews with stakeholders will be scheduled to ensure alignment and to approve or reject any requested changes formally.

- What will you measure to determine if the project is within budget?

Budget control will be maintained by tracking expenditures against allocated costs in project financial reports. Cost variance reports will be completed and reviewed monthly. Resources will be adjusted appropriately based on budget utilization trends.

- What will you measure to determine if the project is within schedule?

Schedule adherence will be assessed by comparing task completion dates against those outlined in the project's Gantt chart. Milestone tracking and timeline reviews will be conducted weekly to monitor progress. Root causes will be identified and mitigated if delays are detected using reallocated resources or timeline adjustments.

3. Quality Control Activities

Define the following:

- How will you ensure that adequate testing is done? How do you define “adequate”?

  For this project adequate testing will be defined as the following:

  a. Full validation of all functional and non-functional requirements as outlined in the Requirements Traceability Matrix (RTM).
  b. Resolution of all critical bugs, defects, or system errors before the system proceeds to deployment.
  c. Successful User Acceptance Testing (UAT) completion, with formal approval from key stakeholders, including Emergency Department (ED) leadership, clinical users, and IT representatives.
  d. A minimum pass rate of 90% or greater across all executed test cases, covering integration, performance, usability, and security testing.

  The following steps will ensure adequate testing is done:

a. **Defect tracking and resolution**: All discovered issues will be logged in a defect tracking system (e.g., JIRA or Azure DevOps) and prioritized for resolution based on severity.
b. **Regular test reviews**: Testing progress will be reviewed at key milestones. Reports will be presented during scheduled stakeholder meetings to ensure transparency and timely feedback.

- How will you report and resolve variances from acceptance criteria?

  Variances will be reported and resolved in the following manner:

  Reporting:

  a. Defect reports will be generated and maintained throughout all testing phases to document issues, severity levels, and status.
  b. A summary of variances will be included in periodic quality reports shared with stakeholders during project status meetings.
  c. Critical variances will be escalated immediately to the project manager and sponsor for resolution planning.

  Resolution:

  a. A Root Cause Analysis (RCA) will be conducted to determine the underlying reason for each variance.
  b. Process flowcharts and/or fishbone diagrams will be used to identify where deviations from expected outcomes occurred.
  c. Each variance will be categorized as minor, major, or critical to guide the appropriate level of intervention and resolution.
  d. All unresolved variances, particularly major or critical ones, must be addressed and verified as resolved before the sponsor provides formal sign-off.

- At what milestones will testing and reviews take place – who and how will they do them?
  a. Initial system setup: IT team will conduct integration testing to ensure seamless connectivity between the Amwell telehealth system and existing IT system by testing data flow, security, and system stability.
  b. End of user training: ED staff and administrators will participate in UAT to ensure staff can navigate the telehealth system efficiently and access patient records securely.
  c. Post-implementation surveys: Patients and ED staff will be surveyed regarding their experience using the Amwell telehealth system. The goal is to achieve >80% satisfaction rate, ensuring the system is meeting stakeholder expectations in usability, performance, and accessibility.
  d. Post-deployment evaluation: Quality analysts will perform a final system review to track system uptime/downtime, response times, and overall performance. Any unresolved issues from previous tests will be reassessed and resolved.
- What action by the Sponsor constitutes acceptance of deliverables at each phase?

  The following actions by the project sponsor will indicate acceptance of deliverables at each project phase:

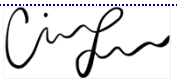
  a. Formal review and approval of project documentation, such as requirements documents, test plans, and training manuals.
  b. Completion of functional verification activities, including signed test results confirming that the deliverable meets specified requirements.
  c. Provision of written sign-off at key phase gates as part of the project governance process.

- What action by the Sponsor constitutes “full and final acceptance” of final deliverables?

  The following actions from the sponsor will indicate full and final acceptance” of the final project deliverables:

  a. Successful completion of User Acceptance Testing (UAT) with no remaining major or critical issues.
  b. All required compliance audits passed, including HIPAA, cybersecurity, and technical requirements.
  c. Formal approval from project leads, including IT, clinical, and administrative stakeholders.
  d. Positive post-implementation feedback, with end-user satisfaction surveys achieving an 80% or higher satisfaction rate.

4. Quality Management Plan Signatures			
Project Name:	Optimizing Emergency Department Efficiency Through Telehealth Integration		
Project Managers:	Alejandro Garcia, Ciara-Lyn Lee, Hetty Udeh		
I have reviewed the information contained in this Project Quality Plan *and agree:*			
Name	**Role**	**Signature**	**Date**
Alejandro Garcia	Risk & Compliance Project Manager		03/18/2025

Ciara-Lyn Lee	Planning & Execution Project Manager		03/18/2025
Hetty Udeh	Stakeholder & Communication Project Manager		03/18/2025

The signatures above indicate an understanding of the purpose and content of this document by those signing it. By signing this document, they agree to this as the formal Project Quality Plan *document.*

9. Project Resource Mangement

9.1 Roles, Responsibilities, and Authority Table

Role	Responsibility	Authority
1. Clinical Informatics Specialist	1. Bridges IT and clinical staff to ensure EHR and workflow optimization for telehealth. Conducts usability testing and staff training. Designs and optimizes telehealth workflows, ensures EHR integration, maps clinical data flows, and aligns documentation standards.	1. Advisory authority on workflow design and clinical documentation. Can approve modifications to clinical workflows and documentation formats, contingent upon consultation with ED leadership and alignment with hospital-wide standards.
2. ED Medical Director	2. Advocates for physician engagement. Ensures clinical workflows meet department	2. Holds final decision-making authority on any workflow or protocol that directly impacts

	standards for patient safety, diagnostic accuracy, and continuity of care. Provides leadership in the resolution of clinical resistance, identifies physician champions, and facilitates training adoption.	physician practice or patient care quality. Can approve or reject clinical workflows, care pathways, and virtual consult procedures based on alignment with emergency care standards.
3. IT Project Manager	3. Responsible for leading all the technical aspects of the Amwell telehealth system implementation. This includes overseeing system configuration, interface development, and successful integration with the hospital's existing EPIC EHR. Coordinates internal IT resources and external vendor teams to ensure all hardware, software, and network components function seamlessly. Develop and execute technical project timeline, risk assessments, and	3. Approve technical modifications to the telehealth platform, including adjustments to interface logic, server configurations, and EHR integration protocols. Allocate IT personnel to specific workflows and reassign tasks as needed to meet project deadlines. Escalate vendor-related technical issues and negotiate resolution timelines and is empowered to update the technical project schedule based on resource availability and performance outcomes.

	contingency planning for system downtime or cybersecurity threats. Collaborates closely with clinical informatics and compliance teams to ensure technical solutions meet user needs and regulatory standards. Additional responsibilities include providing data migration integrity, managing software testing environments, facilitating technical documentation, and supporting go-live readiness.	
4. Telehealth Nurse Coordinator	4. Serves as the clinical operations liaison for nursing staff during the telehealth program's planning, implementation, and operational phases. Ensures nursing workflows are compatible with the Amwell	4. Revise nursing shift schedules to accommodate telehealth training sessions and onboarding. Make minor workflow adjustments to nursing protocols to improve care delivery in virtual environments. Approve

	platform, particularly in triage, documentation procedures, care escalation protocols, and discharge instructions. Trains nursing staff on telehealth procedures to evaluate competency, monitors compliance with standardized protocols, and identifies workflow inefficiencies. Collect frontline feedback from nursing staff, escalate process-related concerns to leadership, and collaborate with the Clinical Informatics Specialist to continuously refine protocols based on real-world nursing use cases.	exceptions to standard telehealth triage workflows in urgent care situations and may lead post-implementation workflow audits to verify nursing adherence and identify areas for improvement.
5. Training Coordinator	5. Organizes training programs (in-person/online), tracks completion, and assesses staff competency.	5. Authority to mandate training completion before go-live and withhold system access for non-compliant staff.

6. Compliance Officer	6. Ensures adherence to HIPAA and data security standards, conducts audits, and updates policies.	6. Authority to enforce corrective actions for non-compliance and halt activities violating regulations.

10. Project Communication Management

10.1 Communication Plan Table

Project Name:	Optimizing Emergency Department Efficiency Through Telehealth Integration
Project Manager:	Group 3
Date:	4/1/2025

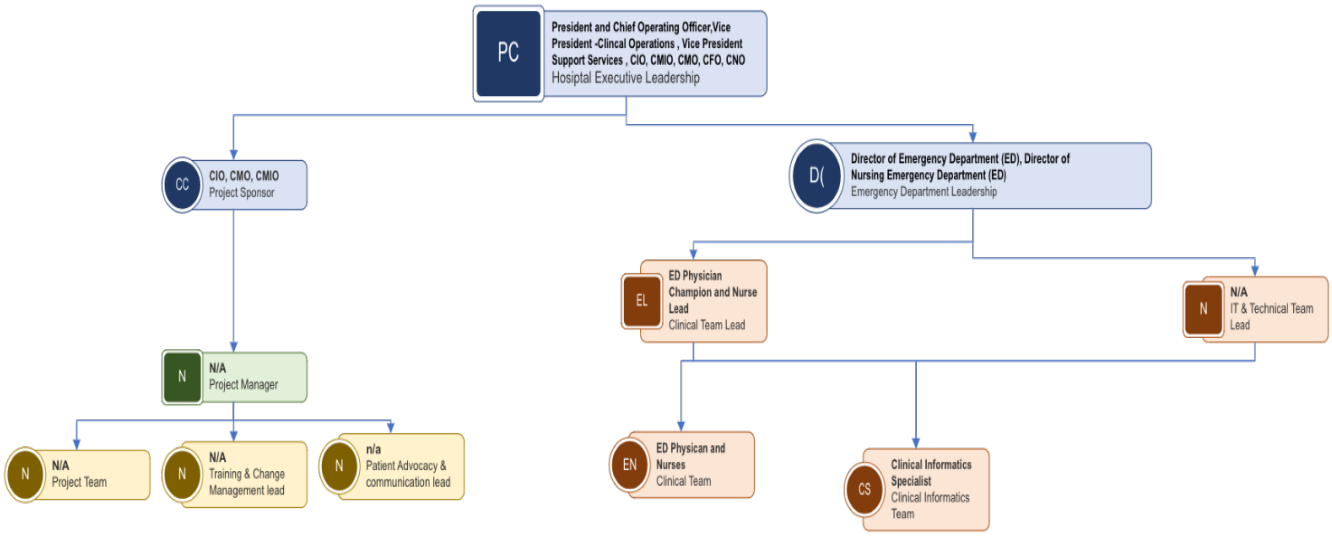
#	Recipient	Message	Assumptions	Timeline	Communication Channel	Recipients Response	Contact Information	Communication Owner
1	Hospital Executive Leadership: Damon Saltzman, President and Chief Operating Officer	Overview of ED telehealth implementation project goals, budget considerations, compliance with	Leadership requires concise, data-driven updates and prefers high-level summaries with financial and operational impact details.	Monthly progress reports, milestone updates, and post-implementation performance reviews.	Executive briefings, email reports, strategic planning meetings, and dashboard updates.	Approval of funding, policy decisions, and strategic direction.	Individual email: Damon.saltzman@hhmc.org Elijah.lockwood@hhmc.org Bonnie.forbes@hhmc.org Stefan.donovan@hhmc.org Group email:	Project manager

	Elijah Lockwood, Chief Medical Officer Bonnie Forbes, Chief Financial Officer Stefan Donovan, Chief Information Officer	regulations, and implementation timeline.					hospitalexecutiveleadership@hhmc.org	
2	Emergency Department Leadership: Elijah Lockwood, Chief Medical Officer Elena Mikaleson, Chief Nursing Officer	How Amwell telehealth will affect clinical workflow, staffing, triage procedures, and patient throughput in the ED. The Leadership's role in enforcing	ED leadership needs details and evidence of efficiency improvements, clear standard operating procedures (SOPs), and alignment with hospital-wide emergency protocols.	Weekly leadership briefings, biweekly progress updates, training sessions 1 month before go-live, daily feedback meetings post-launch.	Leadership meetings, emails, virtual town halls, printed workflow guides.	Provide feedback on workflow concerns, approve training schedules, facilitate buy-in from ED staff.	Individual email: Elijah.lockwood@hhmc.org Elena.mikaleson@hhmc.org Group email: emergencydepartmentleadership@hhmc.org	Project manager

		adoption and ensuring compliance.						
3	IT Department: Joseph Taylor, Director of IT Infrastructure Linda Cheng, Network Systems Administrator	Infrastructure requirements for telehealth platform integration, including network bandwith, cybersecurity protocols, hardware/software compatibility.	IT team will require technical documentation and system requirements well in advance of deployment.	Biweekly tech syncs starting 2 months pre-launch, system testing updates 1 month pre-launch.	Tech meetings, email updates, documentation portal.	Provide infrastructure readiness updates, identify and resolve system compatibility issues.	Individual email: joseph.taylor@hhmc.org linda.cheng@hhmc.org Group Email: itdepartment@hhmc.org	Project manager
4	ED Nursing Staff: Cristiana Bailey, Telehealth Nurse Coordinator Marcus	Training on telehealth equipment use, changes to triage protocols, communication procedures	Nurses will need hands-on training sessions and clarity on workflow changes to avoid disruption in patient care.	Training sessions 3 weeks before go-live, daily Q&A forums during first week post-launch.	In-person training, shift huddles, printed reference guides.	Attend training, ask clarifying questions, provide feedback on process clarity.	Individual email: cristiana.bailey@hhmc.org marcus.ellison@hhmc.org Group email: ednursingstaff@hhmc.org	Project manager

	Ellison, ED RN Team Lead	with remote providers.						
5	Telehealth Vendor (Amwell): Bryce Deblock, Amwell Implementation Specialist Nami Roy, Amwell Technical Project Liaison	Implementation schedule, support availability, troubleshooting workflow, and compliance documentation requirements.	Vendor is expected to provide timely tech support and ensure HIPAA compliance throughout integration.	Weekly implementation check-ins, support line available during go-live week.	Video calls, email correspondence, shared project tracker.	Confirm system readiness, provide ongoing technical support, ensure regulatory compliance.	Individual email: bryce.deblock@amwell.com nami.roy@amwell.com Group email: support@amwell.com	Project manager

10.2 Information Distribution



10.3 Performance Reporting

11. Project Risk Management

11.1 Risk Plan Overview

This risk plan will help create a straightforward approach to how the project team will identify, assess, respond to, manage, and monitor potential risks throughout the Amwell telehealth ED implementation project. This plan aims to identify and reduce any negative impacts, recognize and take advantage of opportunities, and ensure that the project is within scope and budget and completed in the desired time.

The project team will include risk management activities in all the project phases. Regular updates to the risk identification table and ongoing communication with stakeholders will occur.

11.2 Risk Identification

Risk will be identified via Project team brainstorming sessions, performing a SWOT analysis & root cause analysis, interviews with clinical and technical staff, review of lessons learned from past implementations, engaging stakeholders and subject matter experts, and vendor input and market analysis.

Risk ID	Risk	Possible impacts on the project
R1	Vendor delays in delivering telehealth equipment or software	Access to the equipment or software is critical to the project and its timeline. A delay in delivery from the vendors can extend the project schedule, delay go-live, and impact ED operations planning.
R2	Resistance to change from ED clinical staff	Staff is resistant to changes in practice workflows, and new technology usually significantly impacts a project moving forward or not. Resistance to change can lead to poor user adoption, reduced effectiveness of telehealth, need for additional training, and possible reputational risk.
R3	Technical integration issues with EPIC EHR	Suppose the Amwell telehealth has integration issues with the current EPIC EHR in the hospital. In that case, it can disrupt workflows, cause potential data inconsistencies, and lead to the inability to document telehealth visits properly.
R4	Non-compliance with HIPAA or telehealth regulations	Can cause Legal risk, project delays for rework, and reputational damage to the hospital.

R5	Insufficient patient digital literacy or access to devices	Can Limit telehealth adoption, reduce patient engagement, and may result in health equity concerns.

11.3 Risk Management / Schedule

Risk management for the Amwell telehealth integration project will be a continuous process incorporated into every project lifecycle phase. Each phase will include risk-focused checkpoints, clear ownership, mitigation deliverables, and progress reviews. The schedule below defines risk-specific actions integrated with the master project timeline (see Gantt chart in Section 6.1), ensuring that risks are identified early and responded to proactively.

Project Phase	Timeline	Risk Management Activities
1. Project Initiation	Weeks 1–2	• Establish the Risk Management Plan. • Identify and appoint a Risk Officer. • Create a shared Risk Register document for all project stakeholders. • Conduct risk identification workshop with key stakeholders using brainstorming, SWOT analysis, and interviews. • Categorize risks (technical, operational, regulatory, user-related, financial). • Assign preliminary risk ratings a risk matrix.

2. Vendor Contracting & Scope Alignment	Weeks 2–4	• Define SLAs with Amwell vendor to mitigate risk of delivery delays (R1). • Include penalty clauses in vendor agreements for missed timelines. • Clarify scope boundaries to minimize scope creep. • Update Risk Register based on vendor input.
3. Technical Integration Planning	Weeks 5–6	• Conduct interface analysis between Amwell and EPIC EHR (R3). • Perform compatibility testing on sandbox environment. • Identify integration blockers and document contingency pathways.
4. Compliance & Regulatory Review	Week 7	• Conduct internal HIPAA compliance check with Compliance Officer (R4). • Develop checklist for telehealth data privacy, storage, and consent protocols. • Plan external audit dates (pre- and post-implementation).
5. Staff Readiness & Workflow Assessment	Weeks 8–9	• Administer surveys/interviews to ED staff to assess resistance to change (R2). • Identify training needs and learning gaps.

		• Develop change management strategy across shifts.
6. Technical Build & User Testing	Weeks 10–11	• Track bug tickets and integration performance during internal UAT cycles. • Engage “super users” to test workflows and provide feedback on adoption barriers. • Perform cybersecurity risk scan.
7. Training Rollout	Weeks 12–13	• Launch training modules. • Monitor attendance, comprehension scores, and qualitative feedback. • Track user comfort with virtual consultation workflows (R2, R5).
8. Pre-Go-Live Readiness Review	Week 14	• Hold formal Go/No-Go meeting with risk owners. • Review mitigation status of all High and Critical risks. • Finalize contingency protocols for unresolved risks.
9. Go-Live Execution	Week 15	• Deploy telehealth system. • Monitor live risk dashboard with alert escalation procedures. • IT team on standby for technical and integration issues.

10. Post-Implementation Review	Weeks 16–18	• Conduct final review of risk outcomes. • Evaluate impact of residual risks. • Log new risks discovered during go-live. • Update risk status and assign action items.
11. Ongoing Monitoring & Control	Weekly/ Monthly	• Risk Officer leads biweekly project team reviews. • Monthly stakeholder updates on risk resolution progress. • New risks logged, assessed, and prioritized as necessary. • Risk log shared through PM collaboration tool.

11.4 Risk Analysis

Risk analysis was performed through a qualitative risk assesment framework supported by stakeholder inputs, vendor communication, and historical case data. Each identified risk was scored based on: Likelihood of Occurrence and Impact on Project Success. Scores were plotted on a Risk Matrix to determine overall priority level and guide appropriate responses.

Risk ID	**Risk Description**	**Likelihood**	**Impact**	**Priority Level**	**Analysis & Considerations**
R1	Vendor delays in delivering telehealth	Medium	High	High	Delays in hardware delivery or integration software can impact go-live dates and disrupt scheduled staff training.

	equipment/soft ware				Contracts must include performance guarantees and contingency suppliers.
R2	Resistance to change from ED clinical staff	High	Medium	High	Past projects show that workflow resistance and fear of technology reduce user adoption. Change management efforts, ongoing communication, and clinical champions are essential to mitigate.
R3	Technical integration issues with EPIC EHR	Medium	High	High	Any failure in real-time data exchange, visit documentation, or scheduling sync between Amwell and EPIC can undermine patient care and workflow efficiency. Early testing and joint vendor debugging required.
R4	Non-compliance with HIPAA or telehealth regulations	Low	High	High	While unlikely due to rigorous hospital protocols, failure in securing communication or missing consent documentation could result in legal and reputational consequences.

					Compliance audit checkpoints are crucial.
R5	Insufficient patient digital literacy or access to devices	High	Medium	High	Many patients may struggle to use telehealth systems, especially elderly or underserved populations. This can reduce telehealth usage and widen health disparities. Solutions include kiosks, printed guides, and support staff.
R6	Cybersecurity breaches post-integration	Low	High	Medium	The online nature of telehealth increases system exposure. Even with encryption, third-party integrations can introduce vulnerabilities. Regular penetration testing and vendor audit required.
R7	Budget overrun due to scope creep	Medium	Medium	Medium	If non-essential features or hardware are added mid-project, the budget could exceed forecasts. Enforcing change control and ongoing financial tracking will prevent unapproved expansions.

R8	Patient dissatisfaction or low uptake	Medium	Medium	Medium	If patients find the system difficult or unreliable, they may avoid using it, negating project goals. Monitoring user satisfaction and resolving feedback promptly will be essential.

11.5 Risk Response and Mitigation

Risk ID	Risk Description	Response Strategy	Mitigation Actions	Owner
R1	Vendor delays in delivering telehealth equipment/software	Mitigate	• Enforce SLAs with penalties for delays. • Identify backup suppliers for critical components. • Track vendor progress biweekly during contracting phase.	Procurement Lead

R2	Resistance to change from ED clinical staff	Mitigate	• Deploy a change management team and "clinical champions." • Customize training by shift (e.g., hands-on simulations). • Conduct pre-go-live surveys to address concerns.	Change Manager
R3	Technical integration issues with EPIC EHR	Mitigate	• Conduct sandbox testing with Amwell and EPIC vendors. • Document fallback workflows for data exchange failures. • Allocate	Technical Lead

			dedicated IT support during integration.	
R4	Non-compliance with HIPAA or telehealth regulations	Avoid	• Pre-implementation audit by Compliance Officer. • Embed privacy protocols into EHR workflows. • Require vendor certification for HIPAA compliance.	Compliance Officer
R5	Insufficient patient digital literacy/device access	Mitigate	• Provide multilingual guides and 24/7 tech support. • Install telehealth kiosks in ED waiting areas.	Patient Experience Lead

			• Partner with community groups for device loans.	

11.6 Risk Monitoring and Control

Risk monitoring will occur throughout the project lifecycle to ensure mitigation effectiveness and adapt to emerging threats. Key activities include:

1. Ongoing Risk Tracking
    a. Maintain a live risk dashboard updated by the Risk Officer, highlighting unresolved risks, mitigation progress, and priority shifts.
    b. Use the PM collaboration tool to share real-time updates with stakeholders.
2. Scheduled Reviews
    a. Biweekly project team meetings: Review risk register updates, validate mitigation actions, and reassess risk scores.
    b. Monthly stakeholder briefings: Report on high-priority risks (e.g., R1, R3) and budget/scope adherence (R7).
    c. Post-go-live audits: Evaluate residual risks (e.g., R4 compliance status, R5 patient adoption rates).
3. Contingency Protocols
    a. Escalate unresolved risks (e.g., R3 integration blockers) to the Steering Committee for rapid decision-making.
    b. Trigger predefined contingency plans (e.g., backup vendors for R1, extended training for R2) if thresholds are breached.

4. Documentation & Communication
    a. Log new risks (e.g., cybersecurity threats, R6) in the risk register during post-implementation reviews.
    b. Archive lessons learned to refine future risk management processes.
5. Tools & Metrics
    a. Risk matrix: Re-score risks monthly based on updated likelihood/impact data.
    b. UAT feedback: Track user-reported issues (R2, R5) and resolution rates.
    c. Budget tracker: Monitor spending to prevent scope creep (R7).

By integrating these processes, the project team ensures proactive risk management, sustains stakeholder confidence, and safeguards project timelines and outcomes.

12. Project Procurement Management

12.1 Procurement Management

PROCUREMENT TABLE

TITLE OF PROCESS: Plan Procurement Management

INPUTS	TOOLS AND TECHIQUES	OUTPUTS
Project Charter: This defines the project scope, objectives, description, budget, stakeholders. It helps determine what resources are needed.	**Expert Judgement**: This involves consulting individuals or groups with specialized knowledge or training such as subject matter experts, stakeholders, industry professionals to ensure the	**Procurement management plan:** The project charter contains details such as objectives, budget, and constraints and with individuals or groups with knowledge on

	charter reflects realistic goals and needs.	procurement and purchasing a detailed plan on what, how, and when to procure goods/services to meet those objectives can be created.
Project Schedule: This project schedule outlines all key deliverables, deadlines, and resource allocations. In procurement planning, it helps determine when specific goods and services must be acquired to avoid delays. For example, if integration hardware must be installed before staff training begins, the procurement timeline must align with that milestone. The schedule helps identify lead times, contract start dates, and critical path items tied to vendor performance.	**Market Research:** Market research is used to gather information about potential vendors, product/service availability, pricing models, regulatory constraints, and industry trends. For instance, if the project requires specialized telehealth kiosks, market research can reveal which vendors have proven integration with the Amwell platform, associated costs, and delivery timelines. This enables procurement to establish fair pricing, compare vendor qualifications, and	**Procurement Strategy:** The procurement strategy defines the sourcing approach and contract models for the project. It includes whether procurement will be centralized or decentralized, the selection of fixed-price vs. time-and-materials contracts, how contracts will be awarded, and how risk will be allocated. In the context of this project, the procurement strategy

	avoid engaging underperforming suppliers.	ensures that all telehealth components and services are sourced efficiently and delivered in accordance with clinical go-live dates.
Requirements Documentation: This document specifies the project's specific needs, such as the number of instructors, support staff, housing, equipment, transportation, and information technology systems required to run the English Language Training (ELT) program. It helps to establish the exact scope of procurement and ensure that all contract terms match performance expectations and deliverables as described in the PWS (Performance Work Statement).	**Make-or-Buy Analysis:** This process identifies whether certain elements or services (e.g., CBT lab setup, language testing, or even housing) must be outsourced to vendors or be internally managed. Because of the complexity of the worldwide contract and cost-reimbursement terms for travel, visas, and housing, a make-or-buy analysis guarantees optimal utilization of budget and resources.	**Procurement Statement of Work (SOW):** A detailed breakdown of the ELT services, instructor qualifications, deliverables, quality requirements, and timelines. It ensures that vendors understand what's needed—like separate instructor-to-student ratios, CBT labs, and regular reporting. It becomes a core part of the RFP or contract documentation.

13. Project Stakeholder Management

13.1 Stakeholders and Their Roles Table

Tier 1 Stakeholders **Senior Leaders and Key Decision Makers**		
Ensuring project feasibility *(List departments or specific roles)*	**Name of person/group**	**Why exactly is this person/group important?**

Who can help fund the initiative?	• Hospital Executive Leadership Team
	  ○ President and Chief Operating Officer, Damon Saltzman
	  ○ Chief Medical Officer, Elijah Lockwood
	  ○ Chief Financial Officer, Bonnie Forbes
	  ○ Chief Information
		• The President approves the financial investments for the project, can externally secure partnerships and donations
		• The CMO advocates and secures funding from government like Texas HHS telehealth funding
		• The CFO Controls financial budget, approves funding for Amwell telehealth

	Officer, Stefan Donovan	system, ensures project stays within budget constraints • The CIO oversees IT infrastructure, ensures alignment of telehealth with ED goals
Who can provide additional resources?	• Director of IT, Joseph Taylor • Amwell Vendor Account Manager, Bryce Deblock	• Assigns IT personnel for technical support and infrastructure upgrades • Provides external resources (e.g., training materials, technical support, integration specialists)
Who can decide whether or not the project can proceed, be terminated or put on hold?	• Hospital Executive Leadership Team ○ President and Chief Operating Officer, Damon Saltzman	• The Hospital Executive Leadership Team holds the final authority to approve, pause, or terminate the project. They assess alignment

	○ Chief Medical Officer, Elijah Lockwood ○ Chief Financial Officer, Bonnie Forbes ○ Chief Information Officer, Stefan Donovan	with organizational priorities, evaluate risks, and make decisions based on funding availability, resource capacity, and overall strategic value. Their approval is essential for continuing or modifying the project at any major decision point.
Who can remove obstacles and barriers that are beyond the project team's control?	• Chief Medical Information officer, Matt Salvatore • Chief Medical Officer, Elijah Lockwood	• CMIO serves as the bridge between clinical operations and the IT department. He is uniquely positioned to resolve technical challenges such as interoperability issues with the EHR, system access problems, or data integration concerns

		• The CMO holds authority over clinical practices and physician engagement. He can mitigate clinical resistance to change, resolve concerns regarding workflow disruption, and ensure provider alignment with telehealth implementation.
Who needs to approve/sign-off on deliverables?	• Chief Medical Officer, Elijah Lockwood • Chief Nursing Officer, Elena Mikaleson	• The CMO is responsible for reviewing and approving all clinical-related deliverables. Such as clinical workflows and protocols for telehealth use in the Emergency Department, training programs for physicians and advanced practice

		providers and clinical performance metrics related to virtual care. • The CNO ensures all nursing-related components of the project meet safety, compliance, and practice standards. Such as Nursing workflows for telehealth triage, virtual consult support, and documentation, nurse-specific training content and competency assessments and telehealth participation guidelines for ED nursing staff.

Who can help build additional senior level political support?	• Patient Advocacy group lead	• Promote senior level support by sharing testimonials on ED overcrowding by patients in the community
Add other senior leaders and key decision makers who can have an influence on the project	• Chief Medical Officer, Cynthia Horner	• Drives alignment between telehealth and hospital-wide clinical priorities • Mobilizes physician buy-in across departments to expand telehealth • Leverages relationships with medical boards/payers to address licensing/reimbursement barriers

Tier 2 Stakeholders

Project Contributors		
Ensuring the quality of deliverables and activity execution: *(List departments or specific roles)*	**Name of person/group**	**Why exactly is this person/group important?**
Where can we find the required project resources	• IT Project Team • ED Physicians & Nurses	• Leads technical implementation. Ensures Amwell telehealth system is integrated with hospital's existing IT system • Help identify clinical resources required for the Systems implementation such as possible adjustments to staffing and workflows
Where can we find required SMEs?	• ED Staff Managers • Amwell Vendors	• Conducts testing, validates usability

	• EPIC EHR integration specialist • Systems Administrator, Katherine Fall	• Knowledge in Telehealth technology and implementation • Specialize in EPIC EHR integration with other systems • Maintain and configure the servers and operating systems that host the telehealth platform
Who can provide support in the areas of training and competency development?	• Training Team • Physician ED Champion, Meredith Shephard • ED Nurse Lead, Cristiana Bailey	• Develops and conducts training sessions for ED staff • Act as super users and peer mentors for the physicians • Provides input to ensure training aligns with the ED's current practices and workflows

What groups can help us publicize/communicate this initiative	• Emergency department leadership • Hospital marketing & PR relations team • Patient education team	• Communicate initiatives and progress among the ED staff members • Engages the media, creates press releases, newsletters to promote initiative • Design patient friendly materials detail advantages and how to use telehealth
Who can help us support the initiative once it is deployed?	• IT Support Team	• Provides post-deployment support for technical issues, ensures uptime, handles troubleshooting requests
Add others who can contribute to the quality of the initiative	• Quality & Patient Safety Team • Data Analytics • Patient Advocacy Group	• Quality Team: Monitors outcomes (e.g., reduced wait times, patient satisfaction) and

		ensures compliance with clinical standards • Data Team: Tracks KPIs (e.g., telehealth utilization rates, ED diversion success) to measure ROI and optimize workflows • Patient Advocates: Provide feedback on usability/accessibility (e.g., for elderly or non-tech-savvy patients)

Tier 3 Stakeholders **Recipients**		
Areas where people/groups may be impacted: ***(****List departments or specific roles****)***	**Name of person/group**	**Why exactly is this person/group important?**

Who is the intended audience for the project outputs or the change?	• ED Patients • ED staff • Community Health providers	• Primary users, benefit from remote consultations, reduced patient wait times, improved accessibility • ED staff will be impacted by the new telehealth workflow. • Community Health providers will need to engage the ED telehealth documents for follow-up care and consults to ensure continuity of care
Will the change have any effect on secondary groups or individuals?	• ED Staff • Pharmacy services • Emergency Medical Services (EMS) & Paramedics	• Improved workflow, patient redirection from in-person consultations to virtual consultations, reduced overcrowding • Adjustment to medication

		reconciliation workflow to include patients who receive care from telehealth services • Workflow training on diverting non-urgent cases to virtual consults
Add additional individuals/groups who will be impacted	• Hospitalists & Inpatient Teams • Primary Care Physicians (PCPs) & Specialists	• Hospitalists: Receive ED telehealth patients for admission; need integrated records and handoff protocols. • PCPs/Specialists: Provide follow-up care; require access to telehealth consult notes and care coordination.

Tier 3 Stakeholders **Recipients**

Areas where people/groups may be impacted: *(List departments or specific roles)*	**Name of person/group**	**Why exactly is this person/group important?**
Who is the intended audience for the project outputs or the change?	• ED Patients • ED staff • Community Health providers	• Primary users, benefit from remote consultations, reduced patient wait times, improved accessibility • ED staff will be impacted by the new telehealth workflow. • Will need to engage the ED telehealth documents for follow-up care and consults to ensure continuity of care
Will the change have any effect on secondary groups or individuals?	• ED Staff • Pharmacy services	• Improved workflow, patient redirection from in-person consultations

	• Emergency Medical Services (EMS) & Paramedics	to virtual consultations, reduced overcrowding • Adjustment to medication reconciliation workflow to include patients who receive care from telehealth services • Workflow training on diverting non-urgent cases to virtual consults
Add additional individuals/groups who will be impacted	• Hospitalists & Inpatient Teams • Primary Care Physicians (PCPs) & Specialists	• Hospitalists: Receive ED telehealth patients for admission; need integrated records and handoff protocols. • PCPs/Specialists: Provide follow-up care; require access to telehealth consult notes and care coordination.

14. Implementation / Deployment Strategy

14.1 Quality Assurance Methods

To ensure a successful roll-out of the Amwell telehealth integration into the EPIC EHR system, rigorous quality assurance (QA) processes will be followed throughout the entire deployment process. These QA processes are PMBOK best practice-based and aim to verify system performance, data integrity, user satisfaction, and regulatory compliance such as HIPAA.

1. Quality Planning

Quality objectives are defined early in the project lifecycle to align with clinical requirements, IT standards, and patient safety goals. Key quality metrics include:

- System uptime ≥ 99.9%
- Telehealth session connection latency < 2 seconds
- 100% of required fields populated in EHR integration
- UAT approval by all department leads

2. Quality Assurance Activities

Proactive QA is embedded during development and implementation to prevent defects:

- Vendor and internal code reviews during application development.
- Daily build validation within the sandbox environment to identify early integration issues.
- Configuration audits to confirm adherence to clinical workflow designs.
- Security verification to ensure proper role-based access controls, encryption, and audit trails.
- “Day in the Life” (DITL) simulations before go-live to test system readiness in real-world scenarios.

3. Quality Control Tools

To track and manage quality throughout, the following tools and techniques are employed:

- Jira for issue tracking, prioritization (Critical/High/Medium/Low), and resolution status.
- Root cause analysis (RCA) for failed test cases or system outages.
- Control charts to monitor system response times and performance trends.
- Inspection checklists for hardware deployment, software configuration, and training delivery validation.

4. Continuous Improvement

Post-go-live, a feedback loop is maintained through:

- Staff and patient satisfaction surveys analyzed weekly.
- Daily leadership dashboards tracking clinical throughput and error rates.
- Quarterly performance reviews to adjust workflows, retrain staff, and apply software updates.
- Lessons learned repository compiled from implementation to inform future telehealth projects.

By integrating QA throughout the implementation and deployment phases, this strategy supports a seamless transition to telehealth capabilities, minimizes risk, and maintains a high standard of care delivery.

14.2 Application Development

The application development phase focuses on configuring, customizing, and integrating the Amwell telehealth platform with the hospital's existing EPIC EHR system to align with clinical workflows and technical requirements.

Activity	**Description**	**Responsible Team**	**Deliverables**
Requirements Gathering	Collaborate with ED staff and stakeholders to define functional needs (e.g., real-time data exchange, telehealth visit documentation templates).	Clinical Informatics, Amwell Vendor, EPIC EHR Specialists	Finalized requirements document signed by stakeholders.
Customization	Modify Amwell interfaces to match ED workflows (e.g., triage protocols, consult scheduling, patient consent forms).	Amwell Vendor, IT Developers	Customized telehealth UI/UX, integrated consent workflows.
EHR Integration	Develop bidirectional data flows between Amwell and EPIC (e.g., patient vitals, visit summaries, medication lists).	EPIC EHR Specialists, IT Integration Team	Validated HL7/FHIR APIs, seamless data synchronization.
Security Configuration	Apply encryption, role-based access controls, and audit trails to meet HIPAA standards.	IT Security Team, Compliance Officer	Penetration test report, access control matrix.
Prototype Development	Build a sandbox environment for testing and user feedback.	IT, Vendor	Functional prototype with mock patient data.

14.3 Testing

Testing ensures system functionality, security, and usability before full deployment. A multi-layered approach is adopted to mitigate risks such as integration failures (R3) and user adoption barriers (R2).

Testing Phase	**Scope**	**Methods**	**Responsible Team**	**Outcome**
Unit Testing	Validate individual components (e.g., camera connectivity, EHR data pull).	Automated scripts, manual checks.	IT Developers, Vendor	Bug-free modules.
Integration Testing	Verify interoperability between Amwell, EPIC, and hospital networks.	End-to-end simulations (e.g., telehealth consult → EPIC documentation).	IT, Clinical Informatics	Seamless data flow, no latency issues.
User Acceptance Testing (UAT)	Confirm usability and workflow alignment.	Role-based scenarios (e.g., nurse triage, physician consult).	ED Champions, Super-Users	Signed UAT approval from ED leadership.
Security Testing	Assess vulnerabilities (e.g., data breaches,	Penetration testing, audit logs.	IT Security, Compliance Officer	Compliance certification.

	unauthorized access).			
Performance Testing	Evaluate system stability under peak load (e.g., 50+ concurrent consults).	LoadRunner simulations, stress tests.	IT, Vendor	Latency <2 seconds, 99.9% uptime.
Downtime Testing	Validate backup workflows (e.g., paper triage, manual documentation).	Simulated system outages.	ED Staff, IT	Operational contingency protocols.

Risk Mitigation:

- Track issues in a centralized log (e.g., Jira) with priority levels (Critical/High/Medium/Low).
- Retest all fixes before proceeding to the next phase.
- Conduct a “Day in the Life” (DITL) dry run during Phase 1 (Soft Launch Pilot) to mimic real-world conditions.

Post-Testing Actions:

- Update documentation (e.g., Troubleshooting Guide, User Manuals) based on findings.
- Train IT support on common failure modes (e.g., EHR sync errors, device disconnections).

14.4 Documentation

Document Type	**Purpose**	**Responsible Team**	**Distribution Method**
Implementation Guide	Step-by-step guide for the technical setup to help with successful integration	IT, Amwell Telehealth vendors, & EPIC EHR telehealth implementation IT Consultant	IT Shared Drive, PDF
Clinical Workflow Guide	To detail the new ED Workflow with telehealth integration	ED Clinical informatics team	Staff portal, Printed copies for individual staff and copies in binders at designated locations
User Manuals (Physician, Nurse, Admin)	How-to guides tailored to affected roles	Training coordinator	Email, intranet, Printed copies for individual staff and copies in binders at designated locations
Troubleshooting Guide	Common issues, solutions and escalation pathways	IT Support	Knowledge base, hotline, staff portal and copies in binders at designated locations
Policy & Compliance Manual	HIPAA, hospital standards, escalation procedures	Compliance Officer	Policy portal, orientation packets

Training Completion Logs	Track staff readiness and certification	Project Manager, Trainers, Physician and Nurse mangers	HR system, compliance audits, and manger folders

14.5 Installation

Step	Action	Responsible Party
1	Conduct site readiness assessment in ED	IT & Facilities
2	Install hardware (cameras, tablets, kiosks, Monitors, etc.)	IT & Vendor
3	Configure telehealth software, integrate with EHR	IT, Clinical informatics, Vendor and EHR specialist
4	Test connectivity, usability, and security	IT, Clinical informatics, ED staff champions
5	Set up remote access for physicians and other authorized personnels	IT team
6	Validate system with pilot users (soft launch)	Project Manager, Key Physician and Nursing users
7	Final sign-off for go-live	Hospital Leadership, ED Leadership and Sponsors

14.6 Training

Personnel	Training Type	Format	Trainer	Assessment
ED Physicians	Physician Clinical workflow,	Live session with role-playing	Physician Champion and	Case Simulation

	telehealth documentation	in the training environment	Clinical informatics	
Nurses & Support Staff	Clinical Workflow tailored to role, Telehealth equipment use, triage protocols	Live session with role-playing in training environment for Nurses and pertinent support staff. For other support staff, onsite hands-on with videos	Clinical informatics and Training coordinator	Case simulation, checklist and feedback
IT & Admin Support	System maintenance, user support	Internal Knowledge transfer	Vendor & IT lead	Live testing
Patient-facing Staff	Patient onboarding to Telehealth	Demo Sessions and FAQs	Communications lead	Role-based Quizzes
Leadership/ Management	High level oversight, performance monitoring	Briefings, dashboard	Project Manager	Confirmation of understanding

14.7 Implementation (Go Live) Strategy

Chose Strategy: Phase Go-Live

Due to the clinical impact, patient safety considerations, and potential technical complexity of integrating Amwell with the EPIC EHR system, a phased rollout strategy will be used rather than a "big bang" implementation. A phased approach will ensure a smoother transition, provide ample time for issue identification and resolution, and allow users to build confidence before the system is fully operational across all ED functions.

Phase 1: Soft Launch Pilot

- Scope: Implementation in a single ED unit with lower acuity and volume to limit patient risk.
- Duration: 5 business days.
- Involved Personnel: Physician ED Champion designated super-user nurses, IT lead, Clinical Informatics.
- Objectives:
    - Evaluate basic telehealth functionality: connectivity, scheduling, virtual consultations.
    - Confirm system stability and real-time EPIC data flow.
    - Track user activity logs and gather detailed user experience feedback.
- Activities:
    - Simulated patient encounters to test triage redirection workflows.
    - Issue tracking via shared Go-Live Issue Log.
    - Daily huddles to address frontline feedback.

Phase 2: Partial Department Rollout

- Scope: Expand telehealth system to half of the ED, including triage desks and kiosks.

- Key Tasks:
    - Integrate telehealth documentation into standard workflows.
    - Initiate patient-facing education (e.g., digital literacy support).
    - Monitor peak hours for volume stress tests.

Phase 3: Full Department Deployment

- Scope: Full activation of Amwell system capabilities across all ED pods and zones.
- Includes:
    - Mobile and kiosk access points for patients.
    - Remote consultations and specialist availability via telehealth.
    - Integration of follow-up scheduling and care coordination into discharge workflows.
- Support:
    - 24/7 live support for first 72 hours post full go-live.
    - On-site clinical champions available during all shifts.
    - Real-time alerts for system errors, logouts, and failed connections.

Phase 4: Real-Time Optimization

- Daily Reporting:
    - Utilization metrics, failed consults, patient throughput time.
    - Feedback from patient satisfaction surveys and nursing staff logs.
- Leadership Reviews:
    - End-of-week dashboards sent to Project Sponsors and ED Leadership.
    - Adjustment of workflows, reconfiguration of documentation templates, and expansion of access protocols based on feedback.

Risk Mitigation During Go-Live:

- Backup workflow: paper-based triage and in-person consult if downtime occurs.
- Contingency communication plan for failure of kiosk interfaces.
- ED staff surge plan in case of low system adoption on launch days.

14.8 Post Implementation Tasks

After full go-live, the success of the Amwell telehealth integration will depend on ongoing monitoring, user support, optimization, and documentation of lessons learned. Post-implementation activities will be divided into technical stabilization, clinical support, user adoption evaluation, and strategic planning for sustained success.

1. Technical Stabilization

- System Performance Monitoring:
    - Track uptime/downtime logs and system latency reports.
    - Monitor real-time alerts for error codes, failed logins, and device disconnections.
- Issue Management:
    - Log, categorize, and prioritize all technical issues in a centralized issue-tracking platform.
    - Assign issues to IT or vendor teams with Service-Level Agreement (SLA) targets.
        - High-priority issues resolved in <24 hours.
- System Patches & Hotfixes:
    - Apply urgent patches and backend fixes based on feedback and telemetry data.

2. Clinical & User Support

- Help Desk:
    - Maintain 24/7 IT and clinical informatics help desk for the first 4 weeks post-launch.

    - Use escalation tiers: Tier 1 (quick fixes), Tier 2 (vendor support), Tier 3 (integration or regulatory concerns).

- Refresher Training:
    - Identify low-usage or error-prone users and schedule one-on-one sessions.
    - Distribute new training modules based on discovered issues.

3. Evaluation of Adoption & Outcomes

- Metrics Tracked**:**
    - % of non-urgent ED visits successfully redirected to telehealth.
    - Average time saved per patient from triage to provider contact.
    - Reduction in LWBS (Left Without Being Seen) rates.
    - Staff satisfaction and confidence scores (collected via survey).
- Tools**:**
    - Custom dashboards for leadership review.
    - Reports integrated into daily operational briefings.

4. Patient Support & Feedback

- Surveys**:**
    - Automated post-consultation surveys on ease of use, satisfaction, and quality of care.
    - Special focus on patients >65 years or with known barriers to digital health use.
- Support Services**:**
    - Hotline and patient education station staffed by volunteers or educators.
    - Translated guides and video tutorials for diverse populations.

5. Governance, Policy Review, and Documentation

- Policy Audit**:**

    - Ensure all telehealth use aligns with updated HIPAA, CMS, and state-level telehealth regulations.

- Documentation**:**
    - Finalize Go-Live Summary Report with lessons learned.
    - Store updated user manuals, SOPs, downtime procedures, and performance reports in the internal knowledge repository.
    - Record configuration changes and finalize change control documentation for future audits.

6. Long-Term Strategy & Expansion Planning

- Scale to Additional Units**:**
    - Evaluate telehealth's potential in urgent care, radiology follow-up, or inpatient rounding.
- Migration Planning**:**
    - Identify infrastructure needs for future telehealth system features.
- Sustainability**:**
    - Schedule quarterly optimization reviews and semiannual training refreshers.
    - Integrate telehealth usage into onboarding for new ED hires.

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16. Appendix

16.1 Dr. Alter's Work System Snapshot

Work System Snapshot

Customers	Products and Services
• Patients with Non-Urgent Conditions – Redirected to virtual consultations for faster care without long ED wait times. • Emergency Department Healthcare Providers	7. Virtual ED Consultations – Non-urgent patients receive remote medical evaluations, reducing unnecessary in-person visits. 8. Triage & Patient Redirection – The system assesses case severity and directs low-priority cases to virtual care.

– Experience reduced congestion, allowing better focus on urgent cases. • Telehealth Providers – Conduct virtual consultations, evaluate non-urgent cases, and provide treatment or referrals. • Hospital IT Staff – Integrate and maintain the Amwell system within the existing EHR for seamless functionality. • Hospital Administration & ED Operations Managers – Oversee implementation, monitor system performance, and ensure efficiency.	9. Amwell Telehealth Platform Integration – Seamlessly embedded into the hospital's EHR, enabling efficient virtual appointments. 10. On-Demand & Scheduled Appointments – Patients access virtual care via web, mobile phone, or kiosks. 11. ED Workflow Optimization – Reduces overcrowding, allowing ED staff to focus on critical cases. 12. Secure Data Management – Ensures patient records, consultations, and referrals are securely stored and accessible.
Major Activities or Processes	
• **Patient Accesses Telehealth Portal** – Patients with non-urgent conditions use web, mobile, phone, or kiosk to request a virtual consultation. • **System Triage & Case Assessment** – The Amwell platform evaluates symptoms and determines if the patient should be treated virtually or requires in-person care. • **Virtual Consultation with Telehealth Provider** – A licensed provider conducts a remote evaluation, prescribes treatment, or refers to the patient if necessary.	

- **ED Workflow Optimization** – Non-urgent cases are redirected to telehealth, allowing ED staff to prioritize critical patients.
- **System Monitoring & Continuous Improvement** – Hospital administration and IT teams track performance, patient satisfaction, and system efficiency to refine processes.

Participants	Information	Technologies
• Patients • Telehealth Providers • Emergency Department Staff • Hospital IT Team • Hospital Administration & ED Operations Managers	• Patient Medical Records • Symptom & Triage Data • Virtual Consultation Notes • Appointment Scheduling Data • ED Patient Flow Metrics	• Amwell Telehealth Platform • Electronic Health Records (EHR) System • Web & Mobile Telehealth Applications • Telehealth Kiosks & Telephone Systems – Data Analytics & Monitoring Tools

Source: Steven Alter, *The Work System Method: Connecting People, Processes, and IT for Business Results,*

Work System Press, 2006.

16.2 Schedule Development – Gantt Chart

Based on American Medical Association & American Medical Association, *Telehealth Implementation Playbook planning,* American Medical Association, 2021.

16.3 Cost Analysis Worksheet

Houston Health Medical Center

Optimizing Emergency Department Efficiency Through Telehealth Integration

Proposed 5 Year Total Cost of Ownership (TCO)

2022-2026

Vendor Cost	One-time Fees	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Licensed Software	$350,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000	**$12,850,000.00**
Sublicensed Software	$500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	**$8,000,000.00**
Subscriptions	$500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	**$8,000,000.00**
Professional Fees	$300,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000	**$10,300,000.00**
Remote Hosting Fees	$150,000	$1,200,000	$1,200,000	$1,200,000	$1,200,000	$1,200,000	**$6,150,000.00**
Installation Fees	$200,000	$500,000	$500,000	$500,000	$500,000	$500,000	**$2,700,000.00**

Support/Maintenance Fees	$500,000	$500,000	$500,000	$500,000	$500,000	$500,000	**$2,500,000**
Go-live Support Fees	$300,000	$300,000	$300,000	$150,000	$150,000	$150,000	**$900,000**
Travel/Hotel to Client Site	$50,000	$125,000	$125,000	$125,000	$125,000	$125,000	**$625,000**
Other Fees	$75,000	$250,000	$250,000	$250,000	$250,000	$250,000	**$1,325,000.00**
Organizational Cost	**One-time Fees**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Hardware	$500,000	$1,000,000	$500,000	$500,000	$500,000	$500,000	**$3,500,000.00**
Build/Backfill Teams	$400,000	$800,000	$800,000	$800,000	$800,000	$800,000	**$4,400,000.00**
Go-live Support Team	$300,000	$600,000	$600,000	$600,000	$600,000	$600,000	**$3,300,000.00**
Training	$350,000	$700,000	$700,000	$700,000	$700,000	$700,000	**$3,850,000.00**

Travel/Hotel	$100,000	$250,000	$250,000	$250,000	$250,000	$250,000	**$1,350,000.00**
Other	$150,000	$300,000	$300,000	$300,000	$300,000	$300,000	**$165,000.00**
Vendor Total	**$2,225,000**	**$10,700,000.00**	**$10,700,000**	**$10,700,000**	**$10,700,000**	**$10,700,000**	**$55,725,000.00**
Organizational Total	**$1,800,000**	**$3,350,000.00**	**$2,850,000**	**$2,850,000**	**$2,850,000**	**$2,850,000**	**$16,550,000.00**
Taxes	$332,062.50	$1,159,125.00	$1,117,875.00	$1,117,875.00	$1,117,875.00	$1,117,875.00	**$5,962,687.50**
Grand Total	**$4,357,063**	**$15,209,125.00**	**$14,667,875**	**$14,667,875**	**$14,667,875**	**$14,667,875**	**$78,237,687.50**

Organizational Cost Estimated Cost Breakdown (Year 1)			
Hardware	**Quantity**	**Unit Cost**	**Total**

Scanner	45	$2,500	**$112,500**
Computer	100	$2,000	**$200,000**
Other Device (Work Phone, etc.)	125	$1,200	**$150,000**
Sub Total	**270**	**$-**	**$462,500**
Backfill/Build Teams	**No. of Required Build Hrs**	**Rate per hr**	**Total**
RN	5,000	$50.00	**$250,000**
IT	4,000	$60	**$240,000.00**
Other Clinical Staff	3,500	$45.00	**$157,500.00**
Other Staff	3,000	$35.00	**$105,000.00**
Sub Total	**15,500**	**$190.00**	**$502,500.00**
Go-live Support Team	**No. of Support Hrs**	**Rate per hr**	**Total**
RN	2500	$50.00	**$125,000.00**
IT	2000	$60.00	**$120,000.00**
Super User	1500	$45.00	**$67,500.00**
Other Clinical Staff	2000	$45.00	**$90,000.00**
Other Staff	1500	$30.00	**$45,000.00**
Sub Total	**9500**	**$230.00**	**$447,500.00**
Training	**No. of Persons / Items**	**Rate per hr**	**Total**

Training Material	500	$50.00	**$25,000.00**
Training Instructors	5	$100.00	**$500.00**
Training Staff	10	$60.00	**$600.00**
Training - Other	5	$55.00	**$275.00**
Sub Total	**520**	**$265.00**	**$26,375**
Travel/Hotel	**No. of Persons/Items**	**Unit Cost**	**Total**
Airfare	20	$600.00	**$12,000.00**
Hotel Nights (5 days, 1 per room)	100	$150.00	**$15,000.00**
Meals per day (5 days x no of persons)	100	$75.00	**$7,500.00**
Other Travel Needs	0	$10,000.00	**$-**
Sub Total	**220**	**$10,825.00**	**$34,500.00**
Other	**No. of Persons/Items**	**Unit Cost**	**Total**
Other -Licensing & Compliance Fees (HIPAA, cybersecurity audits)	1	$50,000.00	**$50,000.00**
Other - Custom Software Modifications (additional features requested by hospital)	1	$75,000.00	**$75,000.00**
Other - Additional Equipment & Office Supplies (headsets, monitors, furniture, etc.)	50	$500.00	**$25,000.00**

Sub Total	**52**	**$1,255,000.00**	**$150,000.00**