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Idea Title: PulseGuard: LLM-Driven Handoff Intelligence

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Track: Health, Care & Access

Problem Statement: Nurse Shift Handoff Disaster Prevention

A tired night nurse forgets to mention a blood thinner during handoff. The next nurse gives a routine medication. Two hours later internal bleeding.

This isn't a rare scenario. It happens because modern healthcare still relies on **spoken handoffs**, fragmented notes, and human memory at the most fatigue-prone moment of a nurse's shift.

Core Issues

- 80% of serious medical errors occur during handoffs
- Spoken conversations lose critical context
- Existing templates = rigid, incomplete
- Hospitals lack **temporal understanding across shifts**

The problem is NOT documentation
The problem is the loss of continuous clinical memory across shifts

Healthcare tools capture what nurses say but never analyze what they forget to say

Current Systems

- Transcribe speech
- Use checklists
- Store isolated notes

What They DON’T Do

- Detect missing information
- Connect multiple shifts into one patient story
- Overall Scalable Solution

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Proposed Solution

PulseGuard: LLM-Driven Handoff Intelligence

Concept: An AI system that listens to, understands, and reasons over unstructured clinical speech.

System generates:

- Structured patient summary
- Medication tracking
- Allergy & symptom extraction
- Action alerts

An AI Safety Layer for Hospital Communication

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Real Hospital Workflow

1. Ward monitor shows PulseGuard dashboard
2. Nurse speaks using voice assistant (Hindi/English)
3. Audio → Whisper AI
4. FastAPI + MegaLLM extracts clinical entities
5. React Dashboard updates in real time

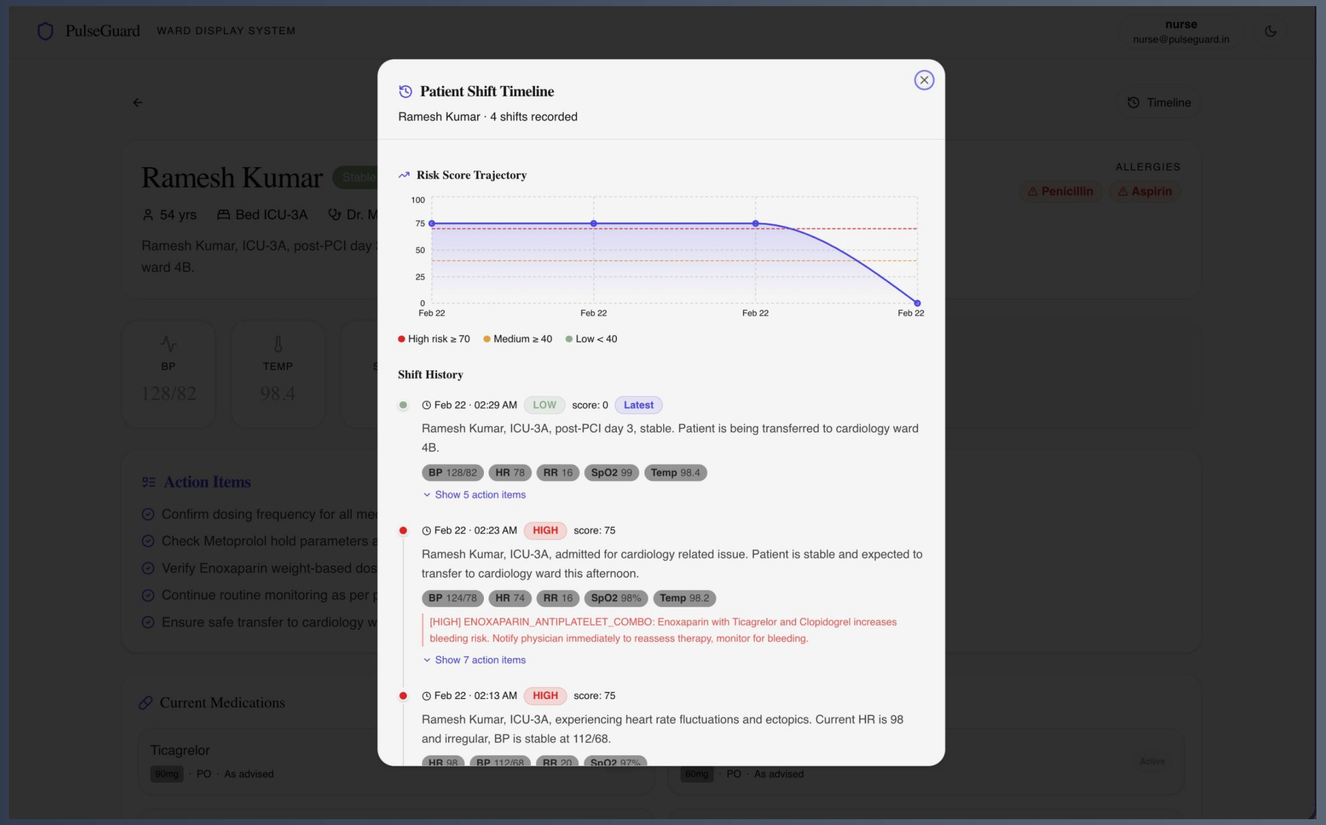
Nurse → Voice Capture → AI Processing → Structured Clinical Screen

UNIQUE FEATURE: CROSS-SHIFT MEMORY GRAPH

Persistent Patient Memory

Tracks:

- Medications started/stopped
- Symptoms progression
- Pending tests
- Allergies mentioned earlier



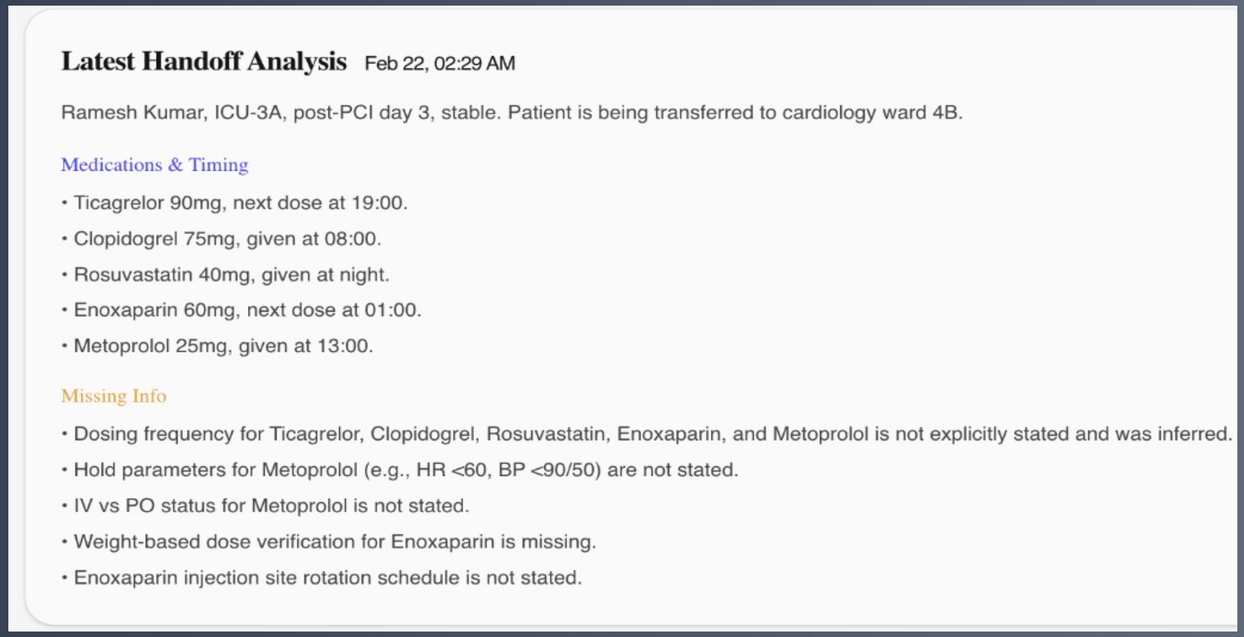
Timeline Snapshot of our Website

We connect conversations into a continuous clinical story

UNIQUE FEATURE: “WHAT WAS NOT SAID” AI

- **Negative Reasoning:** This is our most unique feature. The LLM analyzes the *absence* of critical information

- **Contextual Awareness:** For a high-risk diabetic patient, if the nurse never mentions glucose levels, the system outputs: *"Potential Omission: Glucose monitoring not discussed"*



Missing Info Snapshot of our Website

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TECH ARCHITECTURE

PulseGuard Technical Stack

Whisper AI
→ Speech to Text

FastAPI Backend
→ Audio processing
→ API layer

Mega LLM(GPT & Gemini)
→ Clinical extraction
→ Temporal reasoning

React Frontend
→ Ward Dashboard
→ Timeline View

Scalable LLM pipeline

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SCALABILITY

Built for Hospital Chains, Not Just One Ward

Deployment Model:

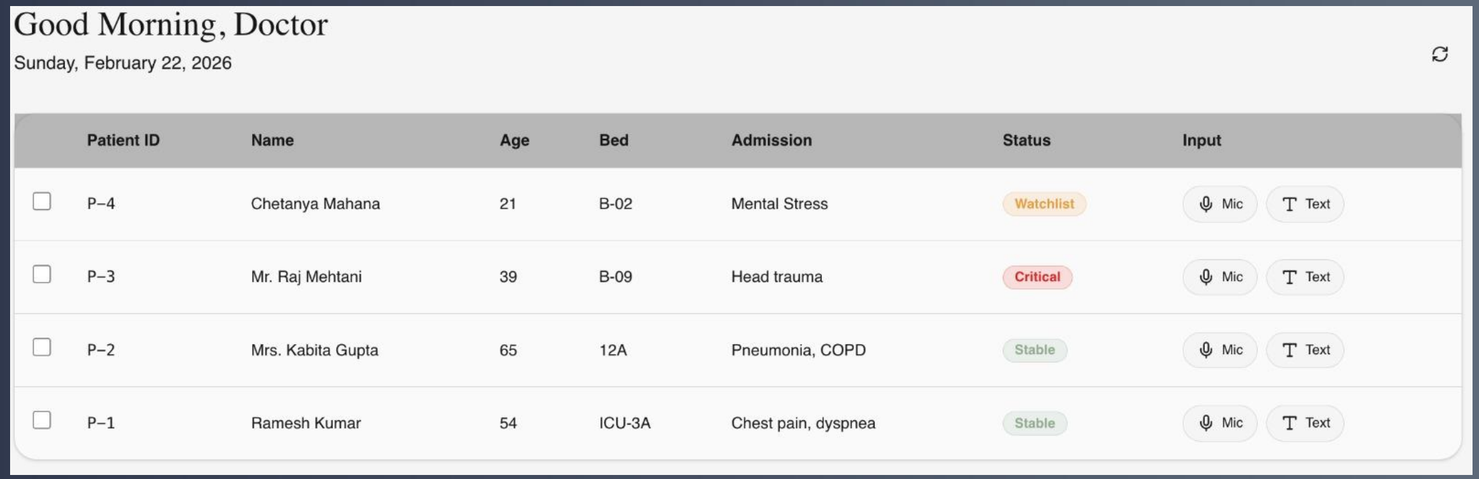
- Each ward = one monitor + web app
- Central AI backend processes all hospitals

Scales to:

- Multi-hospital networks
- ICU wards
- Emergency departments

Business angle:

- SaaS platform for hospital chains
- Subscription per ward / per hospital



Patient Info Snapshot of our Website

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Expected Impact

For Nurses
- Less cognitive load
- Structured summaries
- Clear action points

For Hospitals
- Compliance-ready documentation
- Reduced liability

For Patients
- Prevent medication interactions
- Early detection of hidden risks

Empowering nurses with AI to ensure information survives the handoff intact

WHAT DIFFERENTIATES PULSEGUARD

Most teams will build:

- Chatbots
- Transcription tools

PulseGuard delivers:

- Cross-Shift Memory
- Negative Reasoning AI
- Real Ward Deployment Model
- Scalable SaaS Architecture

PulseGuard transforms nurse conversations into clinical intelligence

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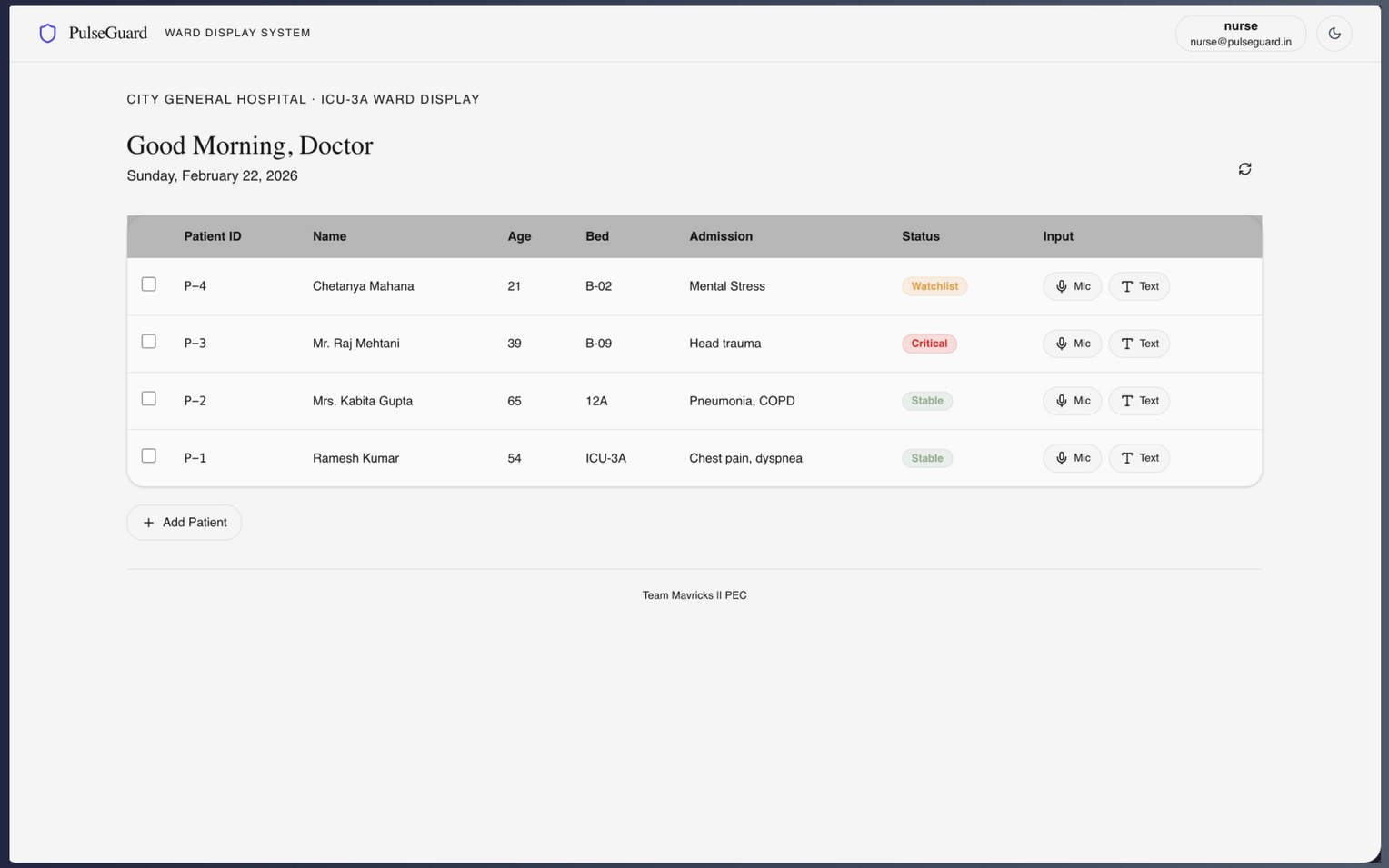
WEBSITE SNAPSHOTS



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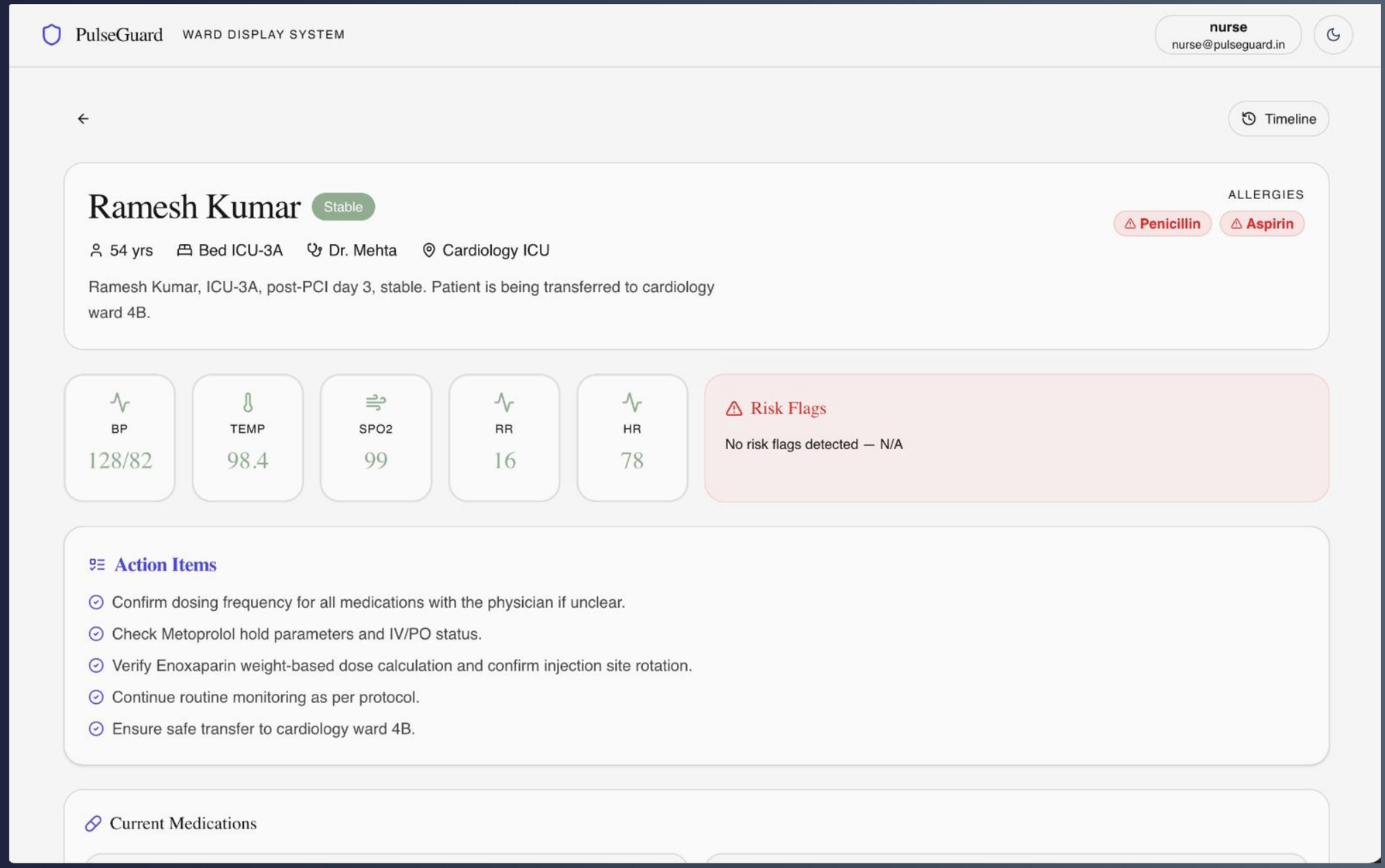

clopidogrel

300mg loading · PO · As advised

Active

Metoprolol

25mg IV q6h · PO · As advised

Active

Heparin infusion

target aPTT 60-80 · PO · As advised

Active

Rosuvastatin

40mg · PO · As advised

Active

Latest Handoff Analysis Feb 22, 02:29 AM

Ramesh Kumar, ICU-3A, post-PCI day 3, stable. Patient is being transferred to cardiology ward 4B.

Medications & Timing

- Ticagrelor 90mg, next dose at 19:00.
- Clopidogrel 75mg, given at 08:00.
- Rosuvastatin 40mg, given at night.
- Enoxaparin 60mg, next dose at 01:00.
- Metoprolol 25mg, given at 13:00.

Missing Info

- Dosing frequency for Ticagrelor, Clopidogrel, Rosuvastatin, Enoxaparin, and Metoprolol is not explicitly stated and was inferred.
- Hold parameters for Metoprolol (e.g., HR <60, BP <90/50) are not stated.
- IV vs PO status for Metoprolol is not stated.
- Weight-based dose verification for Enoxaparin is missing.
- Enoxaparin injection site rotation schedule is not stated.

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Thank You