

NEURO GUARDIAN

**SOPHOMORE YEAR ECE STUDENT'S AT
ST. JOSEPH'S INSTITUTE OF TECHNOLOGY**

TEAM

St. JOSEPH'S INSTITUTE OF TECHNOLOGY
B.E.ELECTRONICS AND COMMUNICATION-
SOPHOMORE YEAR

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PROBLEM :

DIABETIC FOOT ULCER

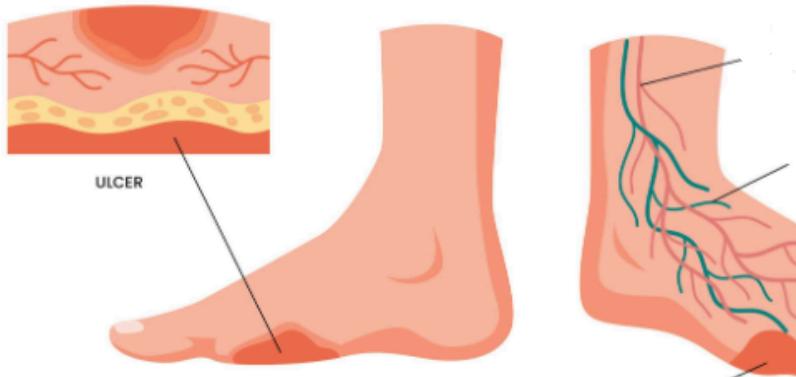


SUPERFICIAL
ULCER

DEEP
ULCER

ABSCESS
OSTEITIS

GANGRENE
FOREFOOT



Falls: Numb feet cause instability and frequent falls.

Silent Ulcers: Patients cannot feel wounds, which worsen unnoticed.

Delayed Treatment: Infection spreads before visible signs appear.

The "Silent Killer" of Neuropathy:

- Diabetic neuropathy causes loss of leg sensation.
- Injuries often go unnoticed, leading to complications.

SOLUTION:

Integrated Safety

Integrated **closed-loop system** for neuropathic diabetic patient safety.

Fall Detection

Combines **fall detection, remote diagnosis, and active treatment.**

Remote Diagnosis

Seamlessly bridges **home care** with hospital treatment systems

Active Treatment

Prevents silent ulcer progression and limb amputations.



- 3-in-1 IoT patient safety
- Instant fall detection alert
- Remote diabetic foot scanning
- Theranostic bandage detects infection
- Blue light wound sterilisation

FUNCTION

Automated Fall Detection

- **Wearable unit** continuously monitors user movement.
- **Detects falls**, triggers alarm and **SOS**.



Contactless Foot Scanning

- **Smart floor unit** improves foot visibility.
- **Captures sole images** for remote diagnosis.



Real-Time Infection Monitoring

- **Smart bandage** monitors wound micro-climate continuously.
- Detects **early bacterial infection** signs.



Autonomous Theranostic Sterilization

- Bandage instantly activates **blue light therapy**.
- **Sterilizes wound** without doctor intervention.



UNIQUE SELLING PROPOSITION:

01. Active Theranostics



- **Active bandage** responds, not just alerts.
- **Sterilizes wounds** before gangrene develops.

03. Zero-Touch Tele-Pathology



- Smart floor scanner eliminates **bending risks**.
- Enables daily **remote foot inspections**.

02. Failsafe Autonomy



- **Offline survival mode** ensures autonomous protection.
- Automatically **sterilizes wounds without connectivity**.

04. Split-Node Comfort Architecture

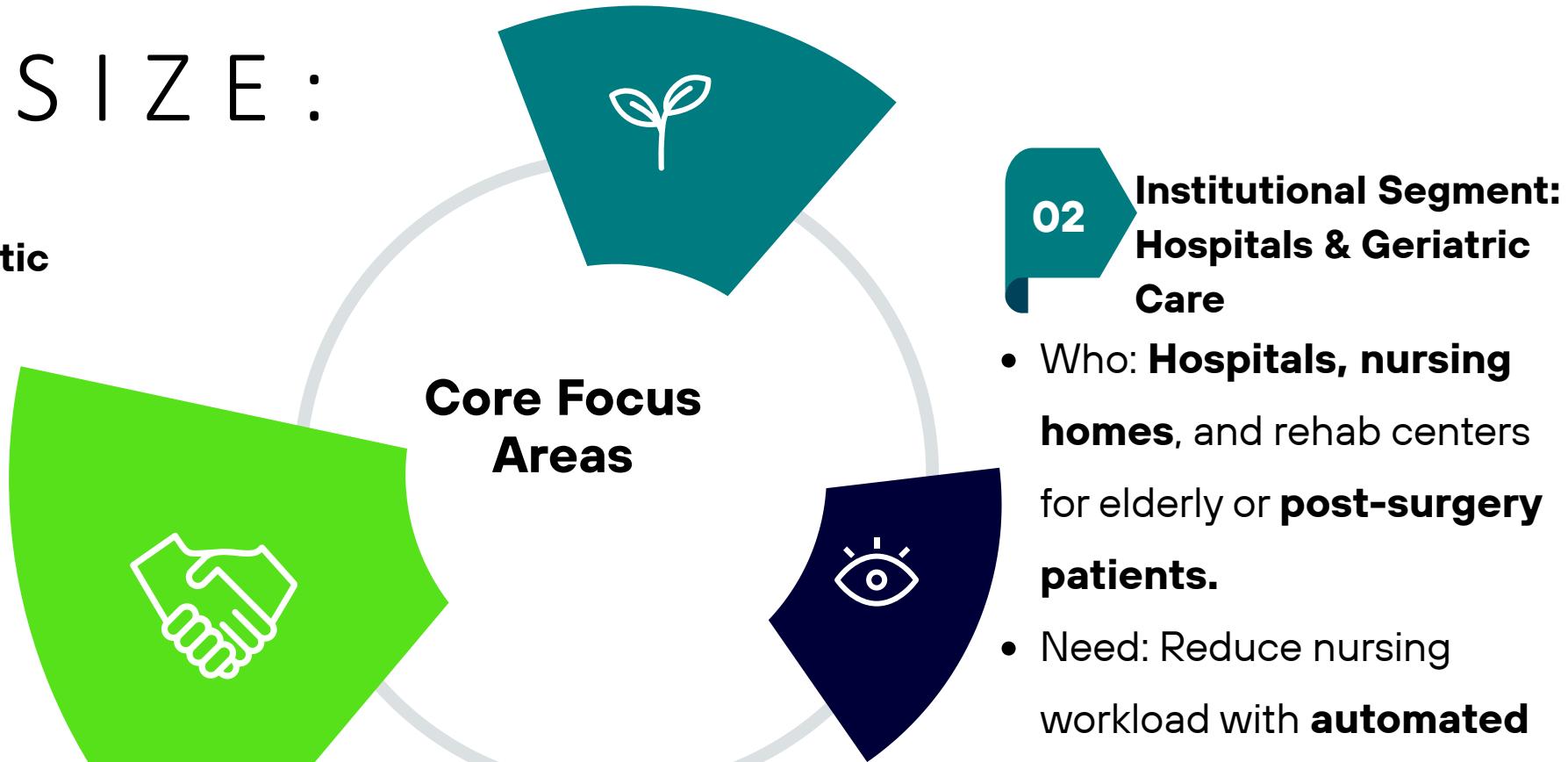


- **Hub-and-spoke design** separates bulky electronics.
- **Thin sensors** ensure comfort and affordability.

CUSTOMER SEGMENTS & MARKET SIZE:

01 Primary Segment: Diabetic & Neuropathy Patients

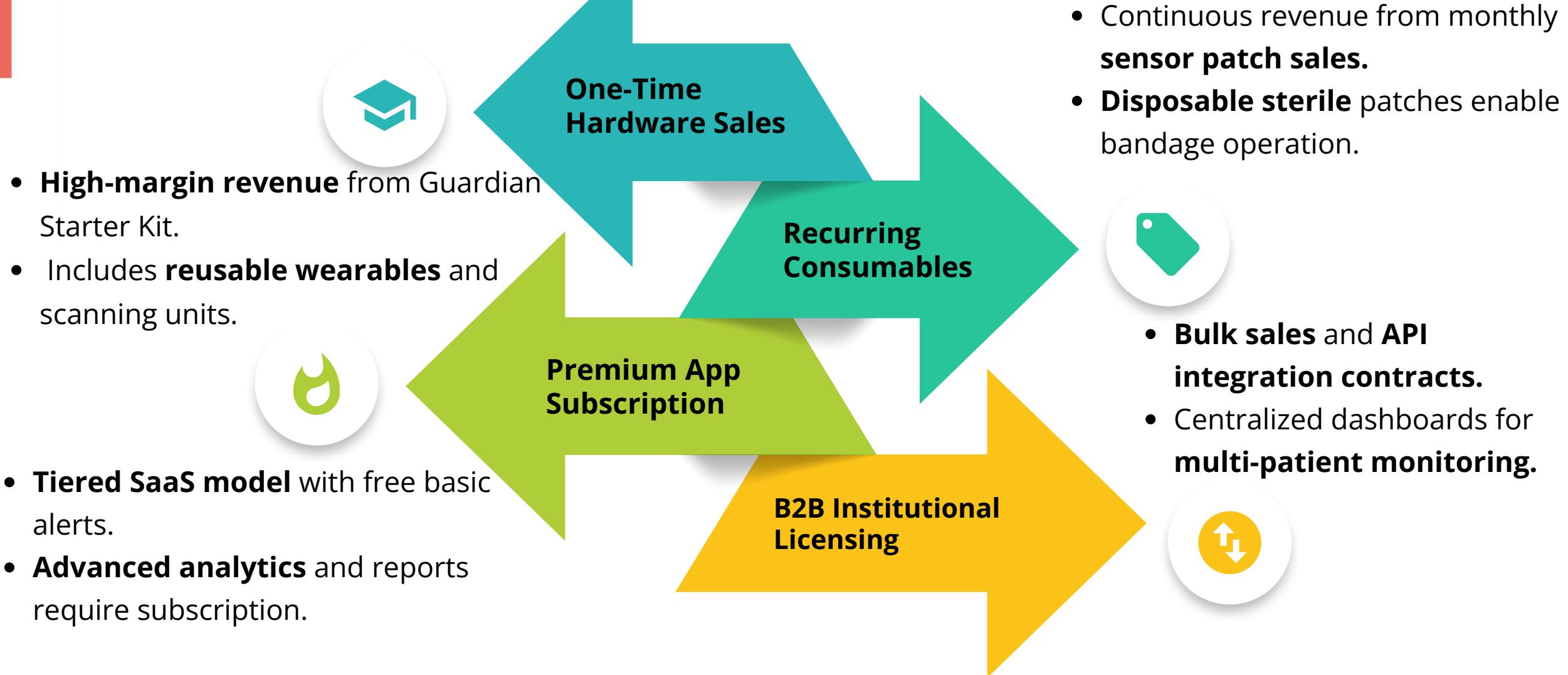
- Who: Individuals with Type **1 or Type 2 diabetes** experiencing **neuropathy** or **chronic foot ulcers**.
- Need: **High-risk group** prone to falls and **potential amputations**.
- Market: India has **77 million** diabetics; **globally, 25%** develop foot ulcers, representing a large market.



02 Institutional Segment: Hospitals & Geriatric Care

- Who: **Hospitals, nursing homes**, and rehab centers for elderly or **post-surgery patients**.
- Need: Reduce nursing workload with **automated fall** and wound monitoring.
- Market: **Global Smart Hospital Market projected at \$115B by 2030**.

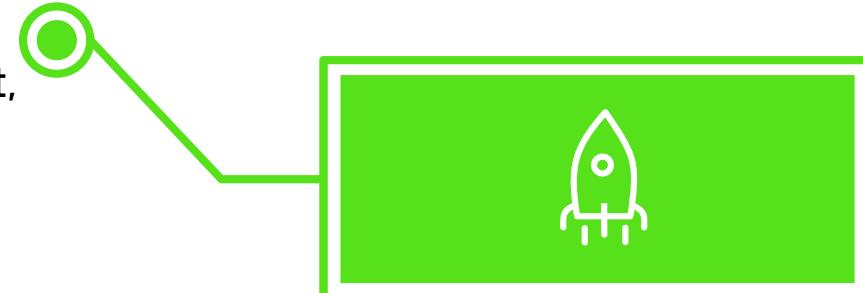
REVENUE MODEL :



STATUS :

Prototype Development

- Project beyond concept, **active prototype** validation.
- Functional modules **currently under** testing.



01

Hardware Integration

- **Core sensors integrated** and fully functional.
- **Split-design bandage** ensures patient comfort.



02



03

04



IoT Infrastructure

- **Blynk IoT** network fully operational.
- All modules **connected to cloud** dashboard.

System Testing

- **Real-time data** transmission under stress testing.
- **Failsafe autonomous logic** tested for outages.

CONCLUSION:



Combines **safety**, **diagnosis**, and **active treatment**.



Acts as a continuous **24/7 guardian**.



Enables **home care** with doctor connectivity.



Reduces hospital burden and **amputations**.

- Transforms reactive care into **proactive theranostics**.
- **AI-driven solution** for diabetic foot management.

