10 th Edition CAHTECH 2025

Harnessing Digital Technology and AI to address IPC and AMS Objectives at Peerless Hospital

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The Problem Statement

Healthcare-Associated Infections **(HAIs)** and Antimicrobial Resistance **(AMR)** are global threats with serious local impact — on patient safety, outcomes, and hospital costs.

Tackling these requires a multi-disciplinary approach backed by data gathered specific to the hospital, staff and patients.

Prior to Digitization based Intervention

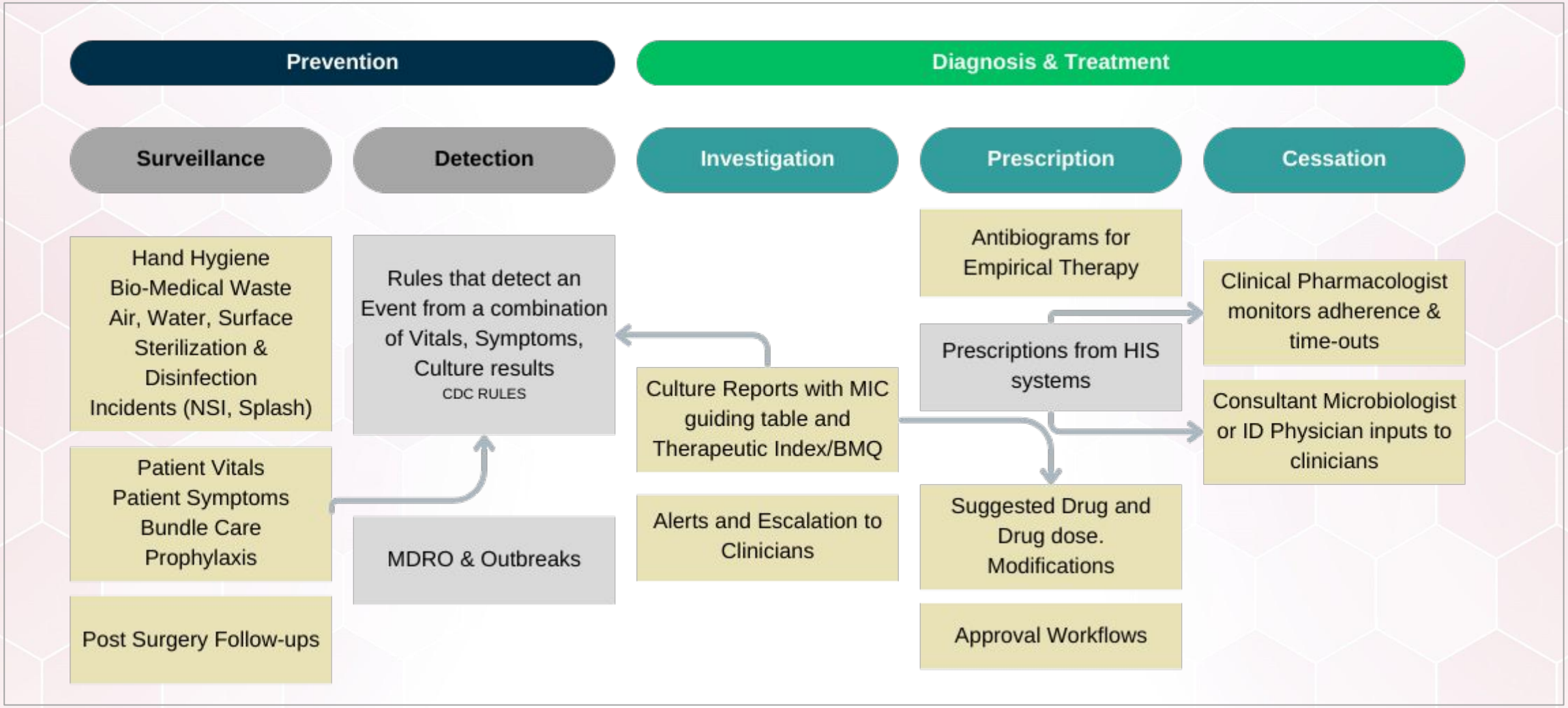
- Paper-based records and spreadsheets
- Communication challenges
- Data retrieval delays
- Limited IPC & AMS Surveillance
- Inconsistent compliance monitoring
- Lack of real-time information and insights for timely decision-making

Key Goals set for Digitization

- Digitization of IPC and AMC processes
- Integrated Platform with Centralized Data
- Standardize Communication
- Automation of Surveillance
- Regular updates on compliance
- Provide actionable insights for all stakeholders

Solution Approach and Methodology

Peerless implemented **Ibhar IPC & AMS** to unify infection control and antibiotic stewardship digitally.



Outcomes and Impact

Full NABH – HIC Audit 2024: Zero NCs, out of 51 objective elements audited as per 5th NABH standards. HIC team received an award from Peerless Management.

OUTCOME INDICATORS

- DDD/1000 (2599 → 2413) 7.2% ▼
  AMS Practice Indicator
- Unsafe triple-antibiotic use % (1.6 → 0) (>3 days) Eliminated
  AMS Practice Indicator
- Standardized Mortality Ratio (1.28 → 0.62)
  Clinical Indicator
- MDR % (40.6 → 32.9) , XDR % (25.1 → 11.7)
  Resistance Prevalence Indicator
- VRE Prevalence % (44 → 26)
  Resistance Prevalence Indicator
- CRAB Prevalence % (95 → 87)
  Resistance Prevalence Indicator
- HAI Benchmark % (0.26 → 0.17), CDI Rate % (0.18 → 0.13)
  Operational Indicator
- ALOS days (4.8 → 4.3)
  Operational Indicator

PROCESS INDICATORS

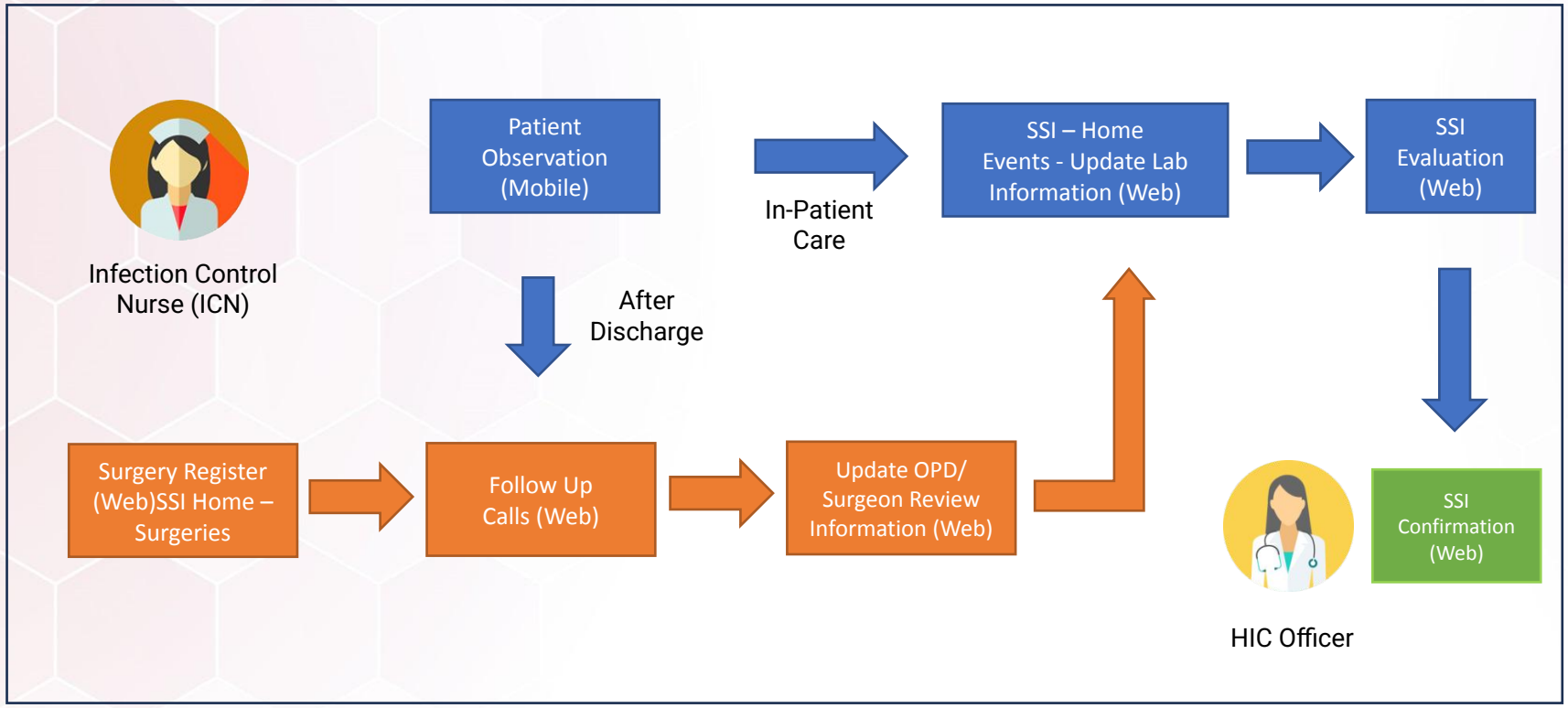
- Diagnostic Stewardship % (87 → 97) ▲
  Compliance Indicator
- SAP Choice % (88 → 94) ▲
  Compliance Indicator
- SAP Duration Compliance % (57 → 51) ▼
  Compliance Indicator - Remains an area of concern
- De-escalation Rate % (46 → 65) ▲
  AMS Compliance Indicator
- Hand Hygiene Adherence Rate % (67 → 76) ▲
  Compliance Indicator
- CL Care Bundle %
  (Flushing 87 → 93.7, Hub decontamination with alcohol swab 80.3 → 98.9, Assessment of readiness to removal 89.7 → 99.4) ▲
- UC Care Bundle %
  (Separate jug, Closed drainage system 89.9 → 99.7) ▲
- VT Care Bundle %
  (Cuff pressure monitored 81.8 → 99.5) ▲

Process Innovation – Implementation and Problem Solving

Peerless formed two dedicated teams: IPC & AMS, led by the Microbiology Dpt., with the ICN team expanded to five ICNs for over 450 beds.

Continuous training was delivered to both ICNs and HCWs on IPC.

Existing software (Ibhar IPC and AMS) **was adapted for Peerless to drive process innovation,** particularly in **SSI tracking** within IPC.



One Team, One Goal
Zero preventable infections

Interdisciplinary teamwork involved **Admin, Microbiology, Nursing, Pharmacy, IT, and Clinical** team collaborating for digital infection control.

Real-time dashboards enabled shared visibility, timely action, and unified decision-making.

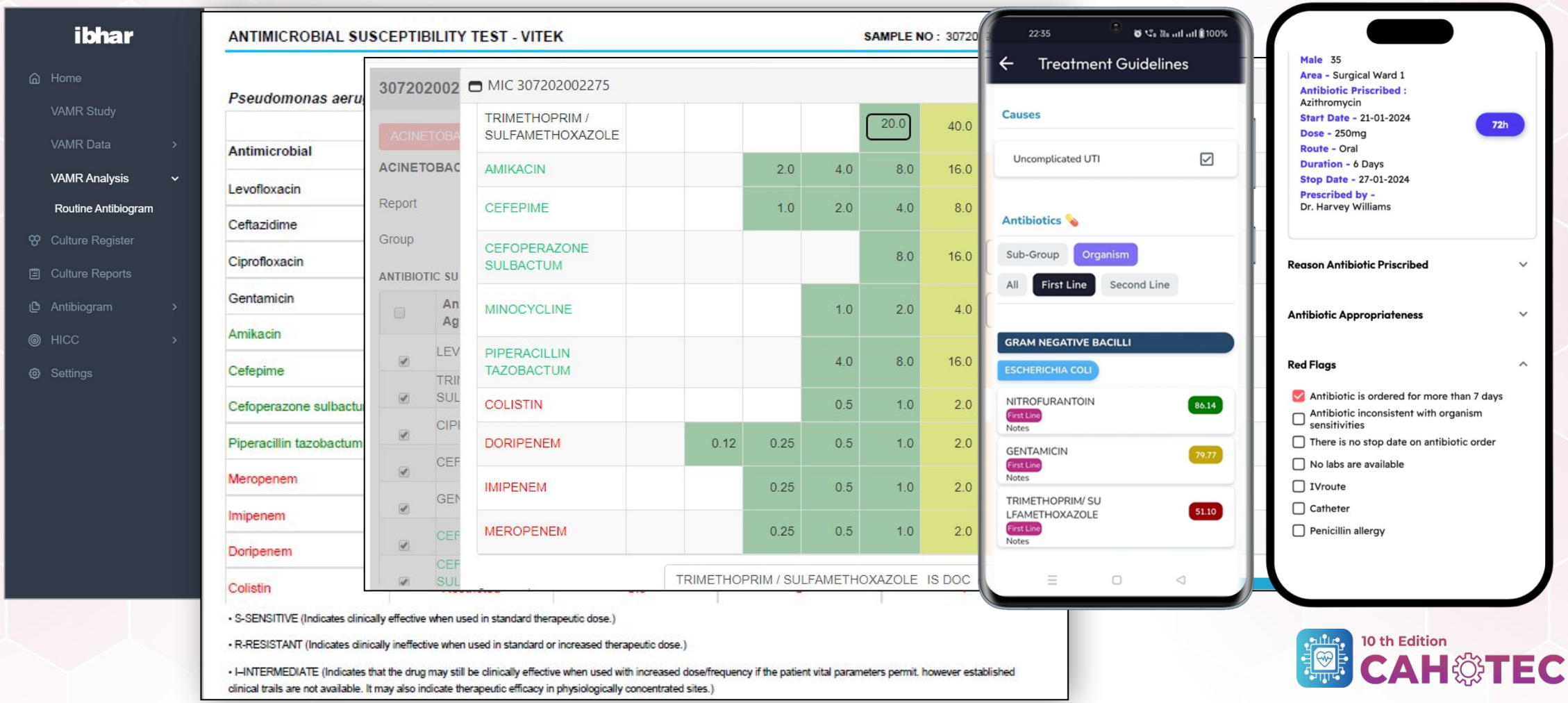
Regular review moved infection control from an individual task to a **collective mission**, improving **accountability, communication, and proactive prevention.**

Top Management's support critical for resource allocation and success.

Prescription – Empirical, Targeted & Cessation

- Up-to-date Antibiogram data is available on Web and Mobile to assist in Empirical prescriptions of Antibiotics.
- Advanced Clinical Microbiology Reporting enables Identification of "Drug-of-Choice" as per hospital's Antibiotic Policy and cascade reporting.

Antibiotic Timeout Audits

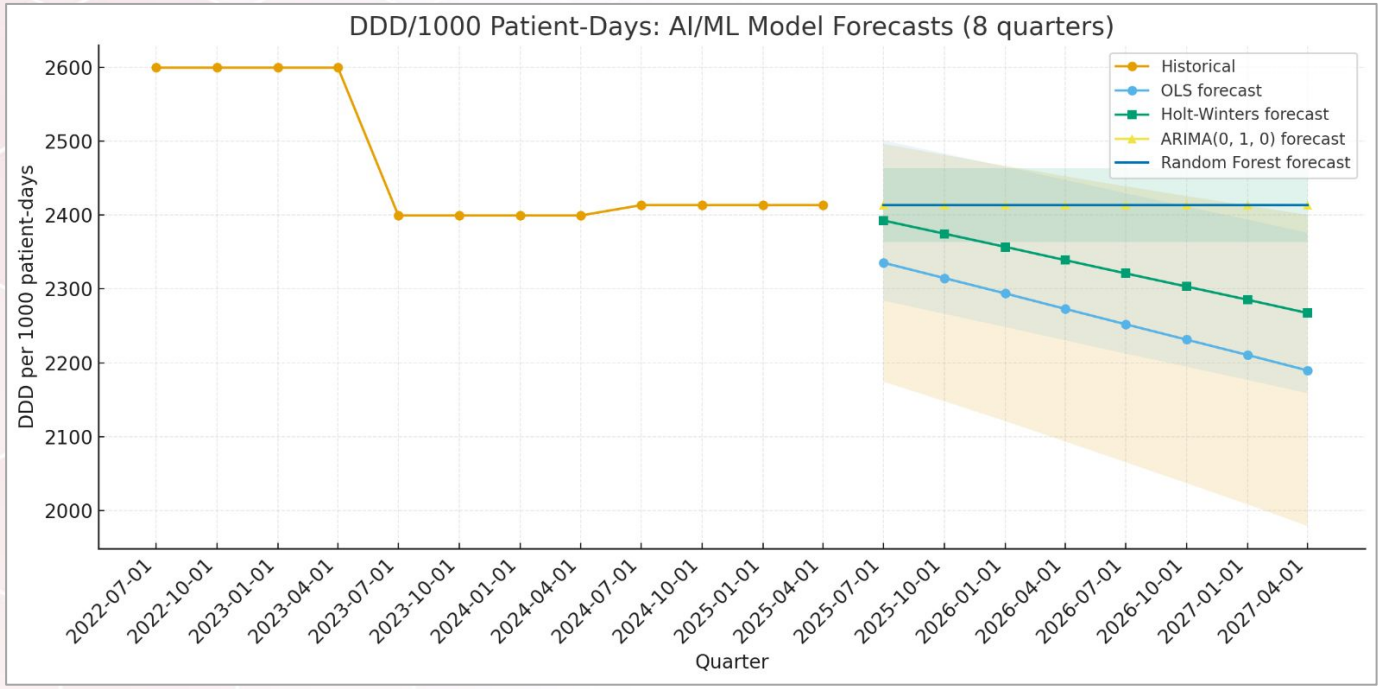


Innovation, Learning and Application of AI/ML Insights for Decision Making

- Mobile apps are used optimally for point-of-care data capture, leveraging browser-based features and analytics.
- Process Innovations like closed loop SSI Monitoring.
- Timely access to antibiogram and drug-of-choice information empowers HCPs with actionable insights.
- AI/ML models are applied to guide reduction of DDD/1000 patient days through advanced statistical and algorithmic projections.

DDD Analysis with Projection of reducing the DDD/1000 Patient Days guidance using AI/ ML models

Statistical and AI Algorithmic projection on the path leading to reducing the DDD/1000 patient days



INSIGHTS

Historical Trend : Historical DDD/1000 patient-days remained high (~2600) until mid-2023; AMS interventions led to sustained reductions (~2400).

Forecasts (2025–2027):**OLS and Holt-Winters f**orecast **models** predict a steady downward trend in DDD/1000 patient days with ongoing stewardship.

ARIMA and Random Forest models suggest stabilization near 2400 without further interventions—emphasizes consistent monitoring and adapting AMS strategies.

Overall Interpretation: Antibiotic consumption is improving but still above optimal stewardship targets.

Future reductions will likely require data-driven and behavioral interventions rather than structural or process-based changes alone.