

Clinical Asset Life Cycle Management

THE PROBLEM

The Clinical Engineering team at a hospital relies on their CMMS as the main source of data for managing the lifecycle of their medical devices and making decisions about the procurement, utilization and maintenance. Recently, they have become concerned with the status of the hospital's infusion pump fleet, as more and more inefficiencies and compliance concerns have been surfacing. An evaluation of their situation identified the following issues:

1. They spend valuable time on manual CMMS data entry that turns out to be incomplete. Collecting and regularly documenting detailed data on thousands of infusion pumps is easily prone to human error – often incomplete – and takes remarkable amounts of time.

2. Their infusion pumps are not used efficiently.

Since there is no systematic way to track their utilization across the hospital, the staff estimates there are both under utilized and over utilized infusion pumps. They occasionally find unused devices while others are used non-stop. This leads to inefficient procurement processes which are not based on data.

3. Finding lost infusion pumps is time-consuming and costly.

Both the Clinical Engineering team and the medical practitioners waste time searching for infusion pumps across the enterprise for preventative maintenance, patching and regular use.

4. Missing devices and data compromises compliance and device functionality.

Regulatory compliance requirements are not met if infusion pumps are lost and not properly maintained and documented. Moreover, the incomplete and outdated data about their operating systems and app versions risk their long-term functionality and the security of the hospital's network.

THE SOLUTION

Introducing Medigate’s platform into the network empowers Clinical Engineering with the data, methods and actionable insights to meet these challenges. It starts by building a granular, real-time inventory that covers all connected infusion pumps, and then collecting and generating detailed utilization and location data while seamlessly integrating it into the hospital’s existing CMMS.

1. Medigate discovers all infusion pumps on the network via DPI and compiles an online and dynamic inventory.

Medigate’s platform uses Deep Packet Inspection to identify all infusion pumps from passively-collected network traffic, relying on a deep understanding of their communication protocols and workflows to extract their technical attributes. Unlike manual CMMS data entry, the network-based approach is automatic, always up-to-date and highly reliable. Medigate’s unique clinically-focused DPI was found superior in comprehensiveness, granularity and precision compared to probabilistic approaches, such as AI/ML-driven.

The screenshot displays the Medigate dashboard for 'Super Medigate Columbia'. The main section is titled 'Infusion Pump (2033)'. It features a summary of inventory and utilization metrics:

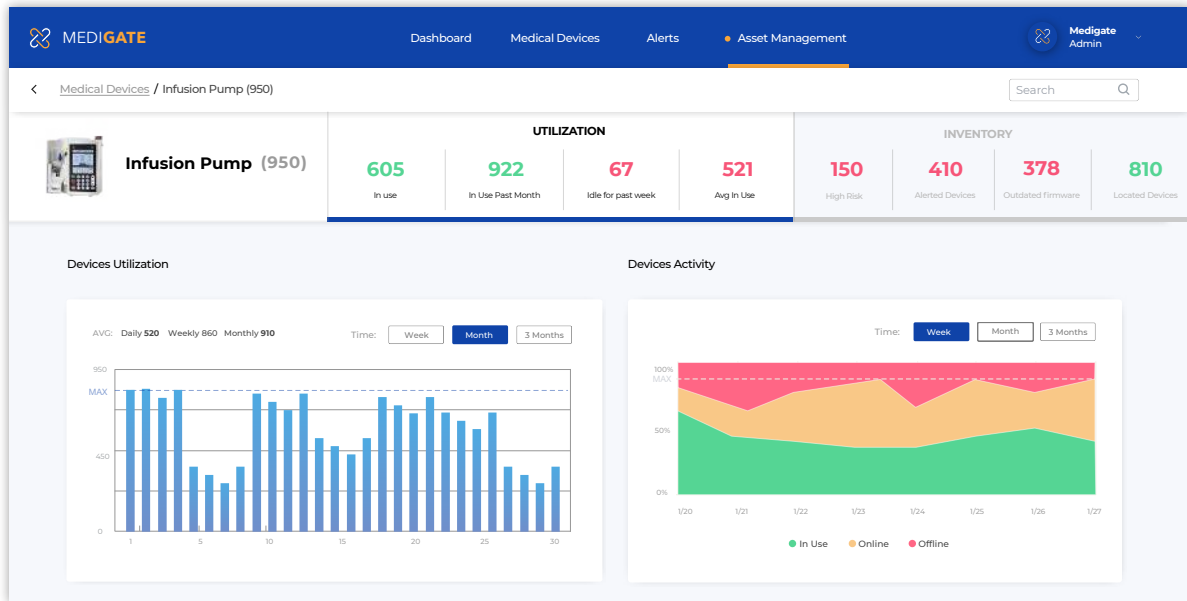
- INVENTORY:** 0 High Risk, 114 Alerted Devices, 1534 Outdated Firmware, 2028 Localized Devices.
- UTILIZATION:** 1220 Online, 2008 In Use Past Month, 63 Idle For Past Week, 1242 Daily Avg. In Use.

Below the summary, there is a table showing a list of medical devices. The table has the following columns: IP, MAC, MANUFACTURER, TYPE, MODEL, LOCATION (PROTOCOL), AP LOCATION (PRIME), STATUS, and RISK SCORE. The table shows several rows of data, including Alaris Medical Systems devices and a respiratory unit.

IP	MAC	MANUFACTURER	TYPE	MODEL	LOCATION (PROTOCOL)	AP LOCATION (PRIME)	STATUS	RISK SCORE
10.100.29.231	0A:65:BC:C7:51:D	ALARIS	Infusion Pump Gateway	Alaris Systems Manager	N/A	N/A	Online	Medium
10.100.29.232	0A:65:BC:0F:4E:AE	ALARIS	Infusion Pump Gateway	Alaris Systems Manager	N/A	N/A	Online	Medium
10.100.29.233	0A:65:BC:59:9D:0D	ALARIS	Infusion Pump Gateway	Alaris Systems Manager	N/A	N/A	Online	Medium
10.100.29.234	0A:65:BC:76:D6:9F	ALARIS	Infusion Pump Gateway	Alaris Systems Manager	N/A	N/A	Offline	Medium
10.100.29.235	0A:65:BC:43:64:3F	ALARIS	Infusion Pump Gateway	Alaris Systems Manager	N/A	N/A	Offline	Medium
10.102.22.250	00:23:68:E4:72:EC	ALARIS	Infusion Pump	8015 PC Unit	Respiratory	Columbia -> Building 5 -> Floor 4	Offline	Low

2. Medigate collects utilization metrics and turns them into actionable reports.

Using the same clinically-based DPI method, Medigate extracts the infusion pumps’ utilization data, such as online/offline times, and presents tailored reports that deliver optimization insights.



3. Medigate obtains location information via DPI.

Data from wired and wireless IT management systems such as Air Wave and Cisco Prime, NACs, and network-based DPI are combined to quickly and efficiently locate each infusion pump within the premises.

4. Medigate automatically exports inventory and location data into the existing CMMS platform, making it easily accessible for preventative maintenance processes.

TYPE	MODEL	LOCATION (PROTOCOL)	AP LOCATION (PRIME)
Infusion Pump Module	8110 Syringe Module	Med / Surg	Columbia -> Building 6 -> Floor 1
Infusion Pump	8015 PC Unit	Adult	Columbia -> Building 5 -> Floor 2
Infusion Pump Module	8110 Syringe Module	Adult	Columbia -> Building 5 -> Floor 2
Infusion Pump Module	8300 EtCO2 Module	Adult	Columbia -> Building 5 -> Floor 2

THE OUTCOMES

Medigate's data and insights immediately improve the Clinical Engineering team's daily and long-term asset management processes by driving more efficient patching, maintenance and utilization. This improves compliance, saves valuable time, reduces costs and extends the life of the devices.

1. Granular, real-time inventory drives timely patching and maintenance.

Medigate creates a unified, online view of infusion pumps' operating systems, hardware and app versions combined with a feed of available firmware and software updates, relevant vulnerabilities, and recall announcements. With this data, the team can now control the security and ensure the functionality of all devices, in addition to compliance requirements.

2. Utilization metrics drive efficient preventative maintenance.

Knowing which infusion pumps are at work and at what times allows the hospital to move 100 pumps from over utilized to under utilized locations while renewing their pump fleet. The metrics also reduce the number of new pumps needed and indicate which pumps can be set for daily maintenance cycles while they are unused. Moreover, Medigate suggests the most appropriate time slots for preventative maintenance, maximizing uptime and continuity of care.

3. Utilization metrics also support data-driven procurement planning.

Medigate maps the use and distribution of infusion pumps as well as other medical devices across the hospital or healthcare system. This enables the Clinical Engineering team to balance the inequities of over and under utilized pumps across departments, saving budget and improving patient experiences.

4. Location data reduces the number of "expeditions" to find missing equipment.

When the next scheduled maintenance of connected infusion pumps is due, Medigate's location data makes sure finding the devices is quick and easy, saving time and money.

Facing a clinical network managed by manual CMMS processes left the hospital's infusion pumps undocumented, lost, unpatched and misused, hindering regular operation and compliance. Medigate delivered real-time, granular inventory for all IoT and IoMT devices. Its ability to automatically feed into existing CMMS provided access to new utilization data and location information, as well as actionable insights that led to improved processes, greater efficiencies and reduce cost. Lifecycle management made simple.