Building adaptable supply chains for medical devices

KINAXIS

scottsheldon

Part of Argon & Co*

Powering reliability, compliance, and patient care in a volatile world

In the medical device industry, supply chain disruptions can have direct impacts on patient care.

From implantable devices and capital equipment to consumables and service parts, medical device manufacturers operate under intense pressure. Rising costs, geopolitical uncertainty, regulatory scrutiny, and increasingly complex global networks all converge to create risk. A single disruption—whether a raw material shortage, sterilization capacity constraint, tariff shift, or supplier failure—can delay procedures, impact quality, and restrict access to care.

To compete and comply in this environment, medical device leaders need more than siloed planning and historical forecasts. They need adaptive, connected, concurrent intelligence across their end-to-end supply chain to enable faster decisions, better collaboration, and confident execution.

An adaptive supply chain is no longer optional. *It is a strategic imperative.*

5 key medical device supply chain challenges and how to overcome them

1. Navigating regulatory and quality complexity

Medical device supply chains must meet stringent global regulatory, traceability, and quality requirements while managing increasingly complex product configurations.

COMMON CHALLENGES

- Country of origin, unique device identifier (UDI), and serialization requirements
- Lot-level and attribute-level traceability across suppliers, CMOs, and geographiess
- Frequent audits with extensive documentation demands
- Product variants, configurations, and lifecycle transitions

SOLUTION

Attribute-based planning, integrated PLM, and supplier collaboration capabilities provide end-to-end traceability from raw materials through finished devices.

Results:

- Faster audit readiness and response
- Improved compliance accuracy
- Greater control over recalls, holds, and regulatory changes

2. Protecting margins amid rising costs

Inflation, labor shortages, logistics volatility, and premium service expectations are compressing margins across the medical device industry.

COMMON CHALLENGES

- Rising material, manufacturing, and transportation costs
- Excess or misaligned inventory across capital equipment and consumables
- Long lead times and capacity constraints
- Demand variability tied to reimbursement and procedure volumes

THE SOLUTION

Advanced demand forecasting, supply-demand balancing, multi-echelon inventory optimization (MEIO), and spare parts planning enable smarter tradeoffs between cost, service, and risk.

Results:

- Reduced excess inventory without sacrificing availability
- Improved working capital performance
- Greater resilience to demand and cost volatility

3. Managing complex, fragmented supply networks

Medical device supply chains extend well beyond internal operations, relying on contract manufacturers, sterilization partners, logistics providers, and field service networks.

COMMON CHALLENGES

- Limited visibility into outsourced production and sterilization capacity
- Raw material shortages and single source dependencies
- Disconnected planning and communication with suppliers, CMOs, and hospital networks
- Complex distribution, installation, service, and returns processes

SOLUTION

Concurrent planning and supplier collaboration connect internal teams with external partners in real time across multiple tiers of the supply network.

Results:

- Improved coordination with suppliers and CMOs
- Proactive risk identification and mitigation
- Reliable delivery of high value, mission critical devices

4. Supporting product mix, service, and lifecycle complexity

Medical device portfolios can be diverse, often spanning long-lifecycle capital equipment, consumables, spare parts, and service models, all with different planning requirements.

COMMON CHALLENGES

- Balancing equipment-to-consumable ratios
- Managing consignment inventory and returns
- Planning for maintenance, repair, and spare parts availability
- Seasonal demand patterns driven by elective procedures

SOLUTION

Connected demand, supply, and inventory planning supports complex product mixes, service models, and lifecycle transitions, while maintaining service levels.

Results:

- Improved forecast accuracy across product types
- Better service part availability
- Reduced waste and obsolescence

5. Accelerating innovation with AI-driven planning

As medical devices increasingly incorporate software, AI, and data-driven capabilities, traditional planning approaches fall short.

COMMON CHALLENGES

- Disconnected R&D, clinical supply, and commercial planning
- Managing product transitions and innovation at scale
- Adopting AI without disrupting regulated processes

SOLUTION

Agentic AI-powered supply chain orchestration enables teams to sense change, evaluate scenarios, and act faster while maintaining governance and compliance.

Results:

- Faster, more reliable product launches
- Improved alignment across functions
- Smarter decisions powered by trusted data

Built-in standard medical technology capabilities

Engineering change management

Multi-level BOM explosion with the ability to simulate proposed BOM changes and understand impact and best timing for change notification

AI & advanced data analytics

Leverage predictive and agentic AI and ML capabilities in a single source of the truth powered with decision intelligence

Inventory optimization & distribution requirements planning

Leverage DRP to determine optimal inventory levels across the network—maximizing on-time delivery and minimizing costs through strategic postponement and replenishment

S&OP, demand & supply planning

Market forecasting, tender management, statistical and sales forecasting, and supply-demand balancing to create a transparent end-to-end network

CDMO / Supplier collaboration

Agile response to changes through streamlined coordination with the supply base as contract network

Fusion of heuristics & optimization

Plan better with a unique fusion of heuristics and optimization for an agile, resilient, and sustainable supply chain

Expiry management

Respect regional/ order-specific shelf life and balance demand & supply and monitor expiry risk using own or dependency logic

Intelligent allocations & multi-sourcing

Automated load balancing across own/third-party manufacturing locations while minimizing cost. Objective-led allocation respecting rules and priorities and inventory objectives

Attribute-based planning & regulatory approvals

Time effectivity and attribute-based planning for alternate BOMs and jurisdictional control

Tender management

Tender tracking, evaluation, and probability considerations

Industry validation

If you'd like validation that Kinaxis is a leader in supply chain planning solutions, look no further than Gartner®.

The 2025 Gartner Magic Quadrant™ for Supply Chain Planning Solutions positions Kinaxis as a Leader. This also marks the eleventh consecutive time Kinaxis has been recognized as a Leader, solidifying our proven track record of bringing innovation to life.[1]

This graphic was published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document.

The Gartner document is available upon request from Kinaxis.

> ***"As a small organization that's in high-growth mode, wereally want to simplify things for our employees."***
>
> JACQULINE OLSON
> DIRECTOR, SUPPLY CHAIN PROCESS IMPROVEMENT
> CONFLUENT TECHNOLOGIES

> ***"When disruptions occur and uncertainty increases, you need full visibility and planning at a network level, not just at a site level."***
>
> VIKRAM DIXIT
> DIRECTOR, SUPPLY CHAIN TRANSFORMATION
> THERMO FISHER SCIENTIFIC

> ***"One thing you cannot underrate with Kinaxis is the native capability when it comes to scenario planning. It's just part of anything you do in the system. For us, it's been a game changer."***
>
> DANIEL LONDONO
> DIRECTOR
> IT PLANNING AND GLOBAL TRADE

4 of the top 10 medical device manufacturers are Kinaxis customers.[2]

Build an adaptive supply chain for the future of medical devices

Kinaxis empowers medical device manufacturers to move beyond reactive planning and build supply chains that are resilient, compliant, and innovation-ready.

With a single, connected platform, organizations can:

Sense disruption sooner

Align decisions across functions and partners

Deliver critical devices and therapies reliably

Because when patient outcomes are on the line,
adaptability matters.

ENDNOTES

[1] Gartner, Magic Quadrant for Supply Chain Planning Solutions – 2021, 2022, 2023, 2024, 2025
Gartner, Magic Quadrant for Supply Chain Planning System of Record – 2014, 2016, 2018
Gartner, Magic Quadrant for Sales and Operations Planning Systems of Differentiation – 2019, 2017, 2015
Gartner, Voice of the Customer for Supply Chain Planning Solutions – 2024

[2] https://www.medicaldesignandoutsourcing.com/2025-medtech-big-100-worlds-largest-medical-device-companies/

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