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Rewiring pharma and medtech supply chains for speed, resilience, and patient impact

Supply chains are playing an increasingly central role in how pharma and medtech companies bring therapies to market—shaping speed to launch, patient access, and overall business performance. What was once viewed as a back-end function is now critical to delivering innovation at scale.

Pharma and medtech supply chains are being stress-tested like never before. Traditional networks and operating models built for predictable demand, long lead times, and stable cost structures are under pressure from every direction. Cost headwinds are intensifying due to geopolitical tensions, tariffs, inflation, more favored nation policies, and labor constraints. At the same time, there are rising expectations for faster, more reliable, and personalized service driven by advancements in product innovation, decentralized trials, and direct-to-patient models.

Leading organizations are already demonstrating what's possible. Companies that have begun modernizing planning and logistics through digital and AI are seeing meaningful results, including improved service levels and double-digit reductions in inventory costs. Manufacturing and quality operations are also becoming more connected and data-driven, enabling shorter release cycles, improved right-first-time performance, and faster tech transfers.

Supply chain leaders should consider multiple dimensions: the forces reshaping pharma and medtech supply chains, how industry-leading supply chains could look in the next five to ten years, the capabilities companies should start building now, and the foundational elements that can underpin this transformation.

The forces reshaping pharma and medtech supply chains

Escalating supply chain costs as resilience becomes nonnegotiable: As companies redesign networks for resilience and proximity, onshoring, nearshoring, and redundancy are increasing unit costs and capital intensity, while tariffs, inflation, labor constraints, and higher service expectations continue to pressure margins and operating spend.

Advanced technology transformation: AI and advanced analytics enable a new generation of supply chain capabilities, including real-time visibility, predictive decision-making, and increasingly autonomous, agentic operating models.

Geopolitical uncertainties: Trade tensions, regulatory divergence, and localization policies are increasing complexity across sourcing, manufacturing, and distribution, forcing companies to rebalance networks across risk, cost, and market access.

New modalities and care delivery models: Cell and gene therapies, personalized medicines, and connected products, combined with decentralized care and omnichannel delivery, require more precise, responsive, and compliant supply chains with tighter control over chain of custody and patient-level fulfillment.

Nearly 60% of pharma and life sciences leaders identify their supply chain as one of the top three business areas most impacted by regulatory and policy volatility. - PwC 2026 Digital Trends in Operations Survey

What the future ready supply chain typically looks like

Given the forces of change at work, the future supply chain will likely look very different from today's networks.

Clinical to commercial acceleration

The line between clinical and commercial supply chains can be far less visible, enabling faster and more confident launches.

- Late-stage clinical and commercial supply will likely run on a shared digital backbone, moving products from pivotal trials to global launch with fewer reconfiguration of sites, formats, and packaging.
- Scenario planning can be embedded into development and launch decisions, allowing companies to pivot quicker based on trial outcomes, regulatory feedback, or competitor actions while reducing waste.
- For advanced modalities and high value therapies, vein-to-vein or device-to-patient orchestration can be standardized with a strong chain of custody, confirming that personalized products can be commercialized at scale.

This helps reduce launch risk, accelerate time to revenue, and improve return on R&D investment by derisking supply as a bottleneck to commercialization.

Direct-to-patient (D2P) and patient-centric models

D2P and direct-to-home is considered to be a mainstream but highly targeted part of the supply chain.

- D2P can be a built-in element of supply chain design with clearly defined patient segments and therapy areas where home delivery, remote monitoring, and personalized packaging are routinely used because in many instances they have been safe, compliant, and economically viable.
- Holistic digital connectivity, from ordering through last mile delivery and returns, can help give patients, providers, and manufacturers real-time visibility with automated exception handling and service recovery as issues arise.
- Patient level data (adherence, usage patterns, adverse events, etc.) can flow securely back into planning, quality, and medical functions, enabling more precise demand signals, proactive support, and better treatment outcomes.

This positions the supply chain as an important enabler of patient engagement and outcomes, not just product delivery.

Autonomous, resilient, and self-enhancing operations

The industry-leading supply chain can be both structurally lean and highly resilient, with planning, manufacturing, logistics and quality while using advanced analytics and AI to help continuously balance cost, service, and risk.

- Network footprints can be enhanced dynamically, combining global centers of excellence with regional and local capabilities, supported by digital twins that are routinely used to test scenarios and guide major investment decisions.
- Manufacturing networks can run on connected, modular lines and digital shop floors that help rapidly switch products and formats using real-time data and AI to enhance throughput, yield, and capacity across sites.
- Quality can be managed through digital, data-driven systems that enable near real-time, risk-based release and better right-first-time performance.
- Day-to-day execution, from order management to transportation and warehouse operations, can be largely touchless for standard flows with human expertise focused on managing exceptions, critical products, strategic collaborators, and innovation.

This allows organizations to move from reactive disruption management to proactive, data-driven enhancements of performance and risk.

Five capabilities that can define the future-ready supply chain

A future-proof supply chain typically demands relentless focus on the end-state vision and immediate investment in the capabilities required to achieve it. Five focus areas highlight where targeted investments today can help unlock meaningful value across cost, speed, and growth.

1 AI-enabled supply chains

AI is a foundational capability to enable the speed, agility, and resilience required in future pharma and medtech supply chains. Applied thoughtfully across planning and supply chain execution, AI can:

- Strengthen your core operations through predictive and enhancement-driven AI improving forecasting, inventory enhancements, production scheduling, logistics routing, and asset maintenance to help reduce shortages, improve service, and lower total cost.
- Elevate decision-making by embedding GenAI-enabled assistants into planner, quality, and logistics workflows so your teams can respond to risks and opportunities faster.
- Lay the groundwork for more autonomous execution using AI to detect exceptions, test response scenarios, recommend actions, and trigger coordinated responses across systems

Realizing this value requires stronger data foundations, clear governance, responsible AI practices, and change management to build user trust and sustained adoption. Over time, this helps set the foundation for increasingly autonomous supply chains that can sense, decide, and act with less human intervention.

2 Smart, connected manufacturing

Digital manufacturing is essential to support more flexible networks, advanced modalities, and the speed expectations of future supply chains. Mature capabilities in this area can:

- Increase agility and efficiency by using integrated MES, IoT, and automation to connect equipment, processes, and operators, enabling real-time visibility into throughput, yield, downtime, and deviations.
- Improve stability and scalability through digital twins, advanced analytics, and predictive maintenance that helps enhance capacity, reduce unplanned outages, and support faster tech transfers and site changes.

Putting this into practice means progressively moving toward a “paperless factory,” and that requires coordinated investment, standardization across sites, and significant change in how your production teams work day-to-day. The result is a more agile manufacturing network that can scale new products faster while maintaining cost and quality performance.

3 Digital quality operations

Next-generation digital quality repositions quality as a proactive, data-driven partner to the business rather than a reactive control function. A more advanced digital quality model can:

- Shorten cycle times and improve right-first-time performance by deploying modern QMS platforms with electronic batch records, in-line/at-line testing, and automated workflows.
- Enhance risk management by using advanced analytics and AI on quality data from manufacturing labs, complaints, and suppliers to detect patterns early and direct resources to the highest-impact issues.

Realizing this vision is a step toward “lights-out labs,” but it requires harmonized global processes, trusted data, and a cultural shift in how your quality, manufacturing, and technical teams collaborate. This helps elevate quality from a control function to a strategic collaborator in speed, reliability, and continuous improvement.

4 Tech-enabled planning

Tech-enabled planning is the decision engine that can connect strategy and portfolio choices to what the supply chain delivers day to day. Modern planning capabilities can:

- Improve your forecast precision and responsiveness by using advanced demand sensing and AI-based models that incorporate real-time sales, prescription, procedure, and channel data that can feed directly into demand, supply, and inventory plans.
- Enable end-to-end scenario planning through a single, constraint-based planning backbone that links demand, supply, inventory and capacity across internal sites and external partners and supports “what-if” analysis for launches, disruptions, and network changes.

To help deliver this value, tech-enabled planning should be underpinned by reliable data, integrated platforms, disciplined processes, and strong leadership engagement. This helps position planning as a true decision engine—linking strategy to execution and enabling faster, more informed trade-offs across the network.

5 Centers of Excellence and Centers of Scale

Operating models that leverage Centers of Excellence (CoE) and Centers of Scale (CoS) enable enterprise-wide orchestration as supply chains grow more complex across modalities, geographies, and partners. These models can:

- Drive effectiveness and consistency through CoS by centralizing high-volume, transactional activities (transportation management, warehouse management, performance management, etc.) onto shared platforms and infrastructure
- Increase responsiveness and build domain expertise through CoE by establishing enterprise-wide standards, governance, and industry-leading practices (network strategy, supplier management, risk management) across business units

Realizing these models requires clear delineation of roles between global centers and business units, strong governance, and investment in enabling technologies and data platforms. When implemented effectively, these operating models help reduce structural complexity, improve service quality, and create a more scalable supply chain—positioning your organization to adopt more advanced, agentic AI capabilities over time.

The foundations that can make transformation stick

Without these foundations, even the more advanced capabilities can struggle to scale—making them critical to realizing the holistic value of supply chain transformation. These underpin how technology is used, how decisions are made, and how people work. They shore up capabilities to function as one coherent, future-ready supply chain.

- **Holistic data and digital backbone:** Implement a harmonized data model and integrated, cloud-based systems so clinical, commercial, manufacturing and logistics can share precise, real-time information and use advanced analytics at scale.
- **Segmented, patient centric operating models:** Design differentiated supply chain strategies for different products, markets and patient groups, so inventory, channels, and service levels are tailored to clinical and patient needs.
- **Partner ecosystem management:** Build strategic, data connected partnerships with CMOs, logistics providers, and technology firms governed by common standards and joint performance goals
- **Talent, culture, and digital upskilling:** Develop cross functional, data-literate supply chain teams that work in agile, outcome focused ways and can quickly adopt your new digital and AI capabilities.

What leaders should do now

Organizations with “future ready” supply chains are outperforming peers on profitability with stronger EBITDA expansion driven by operational leverage and revenue growth. The implication is clear. Supply chain modernization can be self-funding when anchored in value. An agentic ecosystem can be developed to manage a company’s global supply chain and create a competitive edge.

Many of today’s pharma and medtech organizations already invest in the future supply chain, but few are delivering impact at the speed or scale required. Too many efforts remain fragmented, technology-led, and disconnected from the outcomes that matter.

To help close the gap, leaders should act differently.

- **Anchor on bold outcomes, not technology.** Define measurable business outcomes—speed to launch, expanding patient access, addressing cost of poor quality—and reimagine your business processes, operating model, and capabilities to help deliver those outcomes.
- **Move from pilot use cases to scalable enterprise-wide capabilities.** Concentrate on a few critical capabilities such as intelligent planning and quality risk management and deploy them enterprise-wide on integrated platforms and data foundations. Identifying early value drops can compound returns over time.
- **Bring your workforce with you.** Invest in upskilling your organization as it is imperative that your people are equipped and confident to operate in the new environment and can be deployed to work that creates real advantage.

When transformation programs are done properly, real value can be generated through cost takeout, faster cycle times, higher throughput, and a more productive workforce. Those who move decisively can not only improve operations but can help redefine the supply chain to deliver growth, resilience, and patient impact outcomes.

PwC brings deep industry experience across pharma and medtech to help leaders define outcome-driven transformation agendas, stand up and run enterprise-scale programs, and build the capabilities, operating models, and data foundations required to deliver impact at speed.

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