

# Manufacturing confidence

Resilient logistics solutions  
for Healthcare supply chains



## 1

# Rising to the challenge

Healthcare manufacturing is at a critical juncture. The rise of biologics, personalised medicines, and therapies like GLP-1 is reshaping production demands and introducing unprecedented complexity.

Manufacturers face mounting pressure to scale operations, meet regulatory requirements, and respond to global disruptions, all while maintaining quality and budget.

Meeting these challenges requires something many manufacturers may not have considered: a reimagined logistics strategy. To overcome these pressures, manufacturers need a resilient supply chain that can swiftly respond to disruptions, ensure regulatory compliance, and scale operations without compromising patient care.





## 2

## Evolving pressures

From volatile supply chains and workforce limitations to ever-evolving global compliance standards, healthcare manufacturers face a labyrinth of operational demands and regulatory pressures. The key challenges are:

- Demand surges for GLP-1 therapies, vaccines, and treatments strain production capacity and require strict temperature regulation throughout the entire supply chain.
- Capacity constraints and labour shortages challenge operational scalability.
- Regulatory burdens like serialisation and new GxP standards require rigour at the manufacturing level.
- Geopolitical instability and reshoring trends demand flexible sourcing and distribution.

Healthcare manufacturers must rise to meet these shifting demands without compromising patient care, which means scaling quickly, maintaining compliance, and prioritising patient outcomes. Success hinges on supply chain resilience: a combination of agility, precision, and adaptability.



## 3

## Support that moves with you

Support for healthcare manufacturing begins upstream, before production starts. To build robust supply chains, healthcare manufacturers need key capabilities like:



**Raw material and API transport with temperature control and regulatory compliance**



**Coordination of component and packaging material flows, including vials, syringes, and excipients**



**Pre-production logistics across suppliers, plants, and quality teams to ensure readiness**



**Synchronisation across multi-site operations with harmonised processes and digital visibility**

The right partner supplements your supply chain with these key capabilities. Kuehne+Nagel empowers Healthcare manufacturers from the very start. We source critical materials, including excipients, APIs, vials, packaging, and clinical inputs, and ensure their compliant, timely arrival.

Whether in-plant or through our external warehouses located close to the manufacturing site, we orchestrate the flow of materials – from raw materials to APIs to packaging components – ensuring they are always available at the right time and in the right quantity to keep production lines running smoothly.

Once goods leave the factory, we use our global network to ensure they're delivered swiftly to where they're needed most.

## 4

## Cold matters: Maintaining product quality through temperature control

In an industry where lives depend on precision, compliance is non-negotiable. Every component must be handled with uncompromising care and the right temperature control, from active ingredients to final products.

Maintaining warehouses and transport at specific temperatures can be costly to budgets and the environment. However, there is an alternative route that can be both sustainable and cost-effective. Temperature-controlled routes offer improved sustainability and product integrity across global routes and transport modes, maintaining temperature ranges from +2 to +8°C and +15 to +25°C.

### What to look for in warehouses supporting pharmaceutical supply chains:

- GxP and GMP-certified facilities operate under pre-validated standard WMS solutions and audit trail functionality.
- Advanced temperature-controlled infrastructure accommodates 2–8°C, CRT, cryogenic, and ultra-low storage and transport.
- End-to-end serialisation solutions with upstream aggregation, labelling, and regulatory data integration.
- Integrated eQMS (quality management system) solution that serves as a foundation for efficiency and compliance.
- Quality prioritisation, with services like consistent sample collection, RAMAN inspection, and GMP-grade retention storage.

With the right LSP, these capabilities aren't stand-alone. Kuehne+Nagel's HealthChain-certified compliance stack integrates with global visibility tools, partner networks, and client workflows, ensuring traceability and readiness at every touchpoint. Take advantage of services like Cool Corridor, where our experts run a lane risk assessment and help you identify pre-qualified routes and packaging options to ensure end-to-end integrity. Through airtight compliance and meticulous attention to detail, therapies and patient outcomes can be safeguarded.

## 5

## Smart warehousing

In healthcare manufacturing, there is zero room for error. Maintaining product integrity and regulatory compliance demands more than traditional warehousing. Smart warehousing and in-plant logistics are essential to ensure compliance and deliver consistent product quality.

For example, at Kuehne+Nagel, we manage off-site warehouses near the manufacturing plants. A 360-degree end-to-end approach ensures direct production feed, seamless material flow, and consistent operational excellence. These facilities operate in full compliance with the most rigorous GDP and GMP standards, equipped to handle highly complex product categories, including deep-frozen goods, hazardous materials, high-value products, and narcotics.

This combination of strategic location, operational precision, and uncompromising quality ensures that every healthcare product meets the highest standards, especially in environments where compliance and reliability are non-negotiable.



Inventory optimisation to reduce waste and mitigate supply risk.



Automation technologies like automated guided vehicles (AGVs) and pallet repalletising systems enhance speed and accuracy.



Shuttle services between the warehouse and production lines that keep a seamless material flow, minimising downtime.



## 6

## Greater visibility means greater control

Maintaining control and clarity across the healthcare supply chain is vital. Kuehne+Nagel's digital platforms translate complexity into confidence, delivering actionable insights and real-time transparency across every transport mode.

When combining digital platforms like myKN with integrated control towers, manufacturers gain full command over inbound raw materials, onsite inventory, production-ready components, and outbound distribution. This means smarter decisions, faster action, and safer outcomes. Digital platforms like myKN can unlock powerful benefits like:



### Real-time shipment tracking

inventory views, document access, and analytics – all in one secure interface.



### CSV-validated warehouse management systems (WMS)

tailored to the healthcare and life sciences sectors, ensuring full regulatory compliance and zero risk in warehouse data management.



**Serialisation number handling** that integrates seamlessly with customer systems and regulatory databases to ensure products are traceable across the globe.



**Control tower logistics** that consolidate data across locations and modes, issue alerts, and orchestrate rapid, coordinated responses when disruptions occur.



## 7

## Success in action

A leading pharmaceutical manufacturer scaling GLP-1 production faced critical supply chain hurdles: delays in inbound materials, bottlenecks in quality assurance, and gaps in audit preparedness. These issues raised concerns about production continuity, regulatory compliance, and market responsiveness.

Kuehne+Nagel deployed a dedicated production supply solution at the customer's facility, designed to synchronise logistics with manufacturing demand and regulatory expectations.

### Key solution components included:

- **Timely delivery** of active pharmaceutical ingredients (APIs) and packaging materials, reducing lead times and optimising floor space.
- **On-site kitting and QA material flows**, streamlining the movement of critical components through quality checkpoints and into production lines.
- **Real-time inventory visibility and audit-ready documentation**, providing transparent tracking and instant access to validated records.

**The results were quick and clear:** inventory levels reduced by 18%, lowering carrying costs and improving space utilisation; on-time line feeding achieved 99.2%, ensuring consistent production output and minimising downtime; and the regulatory audit passed with zero major findings.

Through integrated supply chain design and on-site execution, the manufacturer unlocked scalable, compliant, and cost-efficient GLP-1 production. Kuehne+Nagel's solution enabled tighter control, smoother operations, and audit-proof logistics, setting a blueprint for future therapeutic scale-ups.



## 8

# At your side, today and tomorrow

Healthcare manufacturing must evolve to meet rising complexity and demand. Kuehne+Nagel delivers adaptive logistics solutions engineered to help manufacturers face these challenges with agility, resilience, and long-term strategic alignment.

Imagine logistics support that goes beyond transactions towards intelligence, integrated production support. Deep expertise, validated processes, and purpose-built platforms can enable healthcare providers to scale faster, stay compliant, and lead confidently into the next wave of healthcare innovation.

Partnering with a logistics provider that can support you from clinical trials through full-scale commercial production is essential to success in this environment. The right partner offers modular infrastructure, flexible staffing models, and a global network with multimodal capabilities. Together, these elements ensure your operations remain agile no matter the circumstance.

In a world where healthcare demands are evolving rapidly, strategic logistics partnerships are essential to delivering innovation, resilience, and patient care at scale.

## Key offerings



### Scalability

From clinical trials to full-scale commercial production, modular infrastructure and flexible staffing models ensure readiness at every phase.



### Flexibility

A global network and multimodal capabilities enable rapid pivoting in response to shifting market demand and regulatory landscapes.



### Strategic partnership

Our solutions integrate with your goals, systems, and standards to become an operational extension of your supply chain.

# About us

With approximately 82,000 employees at almost 1,300 sites in close to 100 countries, the Kuehne+Nagel Group is one of the world's leading logistics providers. Headquartered in Switzerland, Kuehne+Nagel is listed in the Swiss blue-chip stock market index, the SMI. The Group is the global number one in air and sea logistics and has strong market positions in road and contract logistics.

Kuehne+Nagel is the logistics partner of choice for 400,000 customers worldwide. Using its global network, logistics expertise and data-based insights, the Group provides end-to-end supply chain solutions for global companies and industries. As a member of the Science Based Target Initiative (SBTi), Kuehne+Nagel is committed to sustainable logistics by reducing its own environmental footprint and by supporting its customers with low-carbon logistics solutions.

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