

THE RIGHT PRESCRIPTION FOR YOUR SUPPLY CHAIN

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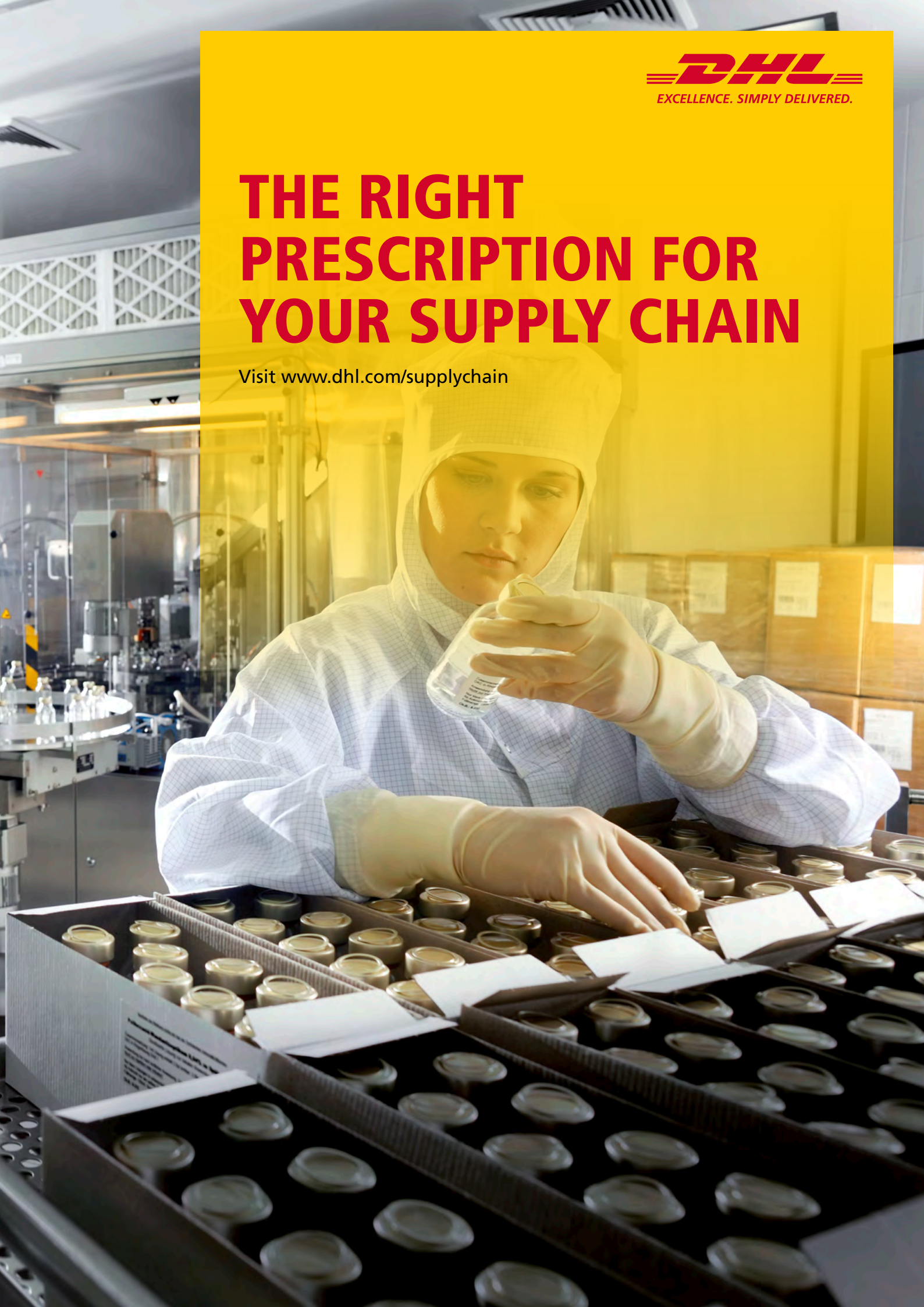


TABLE OF CONTENTS

Supply chain challenges

Achieving cost efficiency
Complexity
Regulatory requirements
Mergers and acquisitions
Temperature assurance
Counterfeit products
Visibility of inventory

Sub-sectors and their supply chain dynamics

Our supply chain solution

Pharmaceuticals
Medical devices
Hospitals and health services
Clinical trials

04

Our unique capabilities

Global footprint and industry expertise
Commitment to excellence
Quality and regulatory compliance
Cold chain and temperature assurance
Health, safety and security

08

Solutions for Life Sciences & Healthcare industry

10

Plan – laying the foundation

Source – getting the materials you need

Make – manufacturing the product

Deliver – getting it where it needs to be

Return – receiving support when it's needed

05

06

Our supply chain services

12

Warehousing services

Transportation services

Unrivalled heritage and expertise

14

04

Supply chain challenges

Life sciences and healthcare companies are remodelling their supply chains in order to increase reliability and security, trim costs and reduce time to market.



06

Our supply chain solutions

We provide unrivalled heritage and capability in compliant, specialist supply chain solutions to the global healthcare industry.

Our supply chain services

Continuously evolving and improving, our wide-ranging solutions help organizations to address their most complex, pressing operational needs from transportation to management services.



12

SUPPLY CHAIN CHALLENGES

Life sciences and healthcare companies are remodelling their supply chains in order to increase reliability and security, trim costs and reduce time to market for new products and technologies, to achieve a competitive advantage.

Complexity

Over the past decade, the supply chains of life sciences and healthcare companies have tended to become ever more complex with multiple manufacturing facilities, favourable tax regimes, long lead times on biologics, seasonality for vaccines and product launch for generics. This is in part due to initiatives designed to cut costs, address time pressures and comply with regulatory requirements. Over time, this can lead to unnecessarily complex systems that undermine efforts to streamline supply chains and identify areas of improvement.

Regulatory requirements

Companies operating in the life sciences and healthcare space are subject to an ever changing and growing set of regulations and compliance requirements that vary between countries and regions. Supply chains need to be able to comply with regulations, without sacrificing efficiency and cost effectiveness, which requires agility to take advantage of regulatory changes.

Mergers and acquisitions

The pharmaceutical industry continues to see an increase in mergers and acquisitions as companies look to boost product pipelines, acquire much needed expertise in areas such as biotechnology, and access new revenue streams such as generics. Merging companies may have very different approaches to supply chain, and these will need to be integrated in the most efficient and least disruptive manner if cost and efficiency savings are to be realized.

Temperature assurance

The industry increasingly has a requirement for temperature controlled transport, storage and production, which can add an additional layer of complexity for supply chain managers. Dealing with supply chains that require

controlled temperatures (2-8°C, 15-25°C etc.) and very low temperatures (for example -150°C), throughout a global network of facilities and transport methods is a key skill which is increasingly required.

Counterfeit products

Counterfeiting of products is a growing problem, intensified by the rise of online commerce. The need to ensure a safe and genuine product has led to a number of companies re-evaluating supply chain processes to prove e-pedigree. In some cases they are supplying direct to pharmacies or they need to do additional labeling/serialization in order to comply with national legislation.

Visibility of inventory

Compared to other sectors, uptake of supply chain visibility technology has been slow within life sciences and healthcare. Companies adopting these new technologies have achieved inventory and cost reductions in both commercial and clinical supply chains.



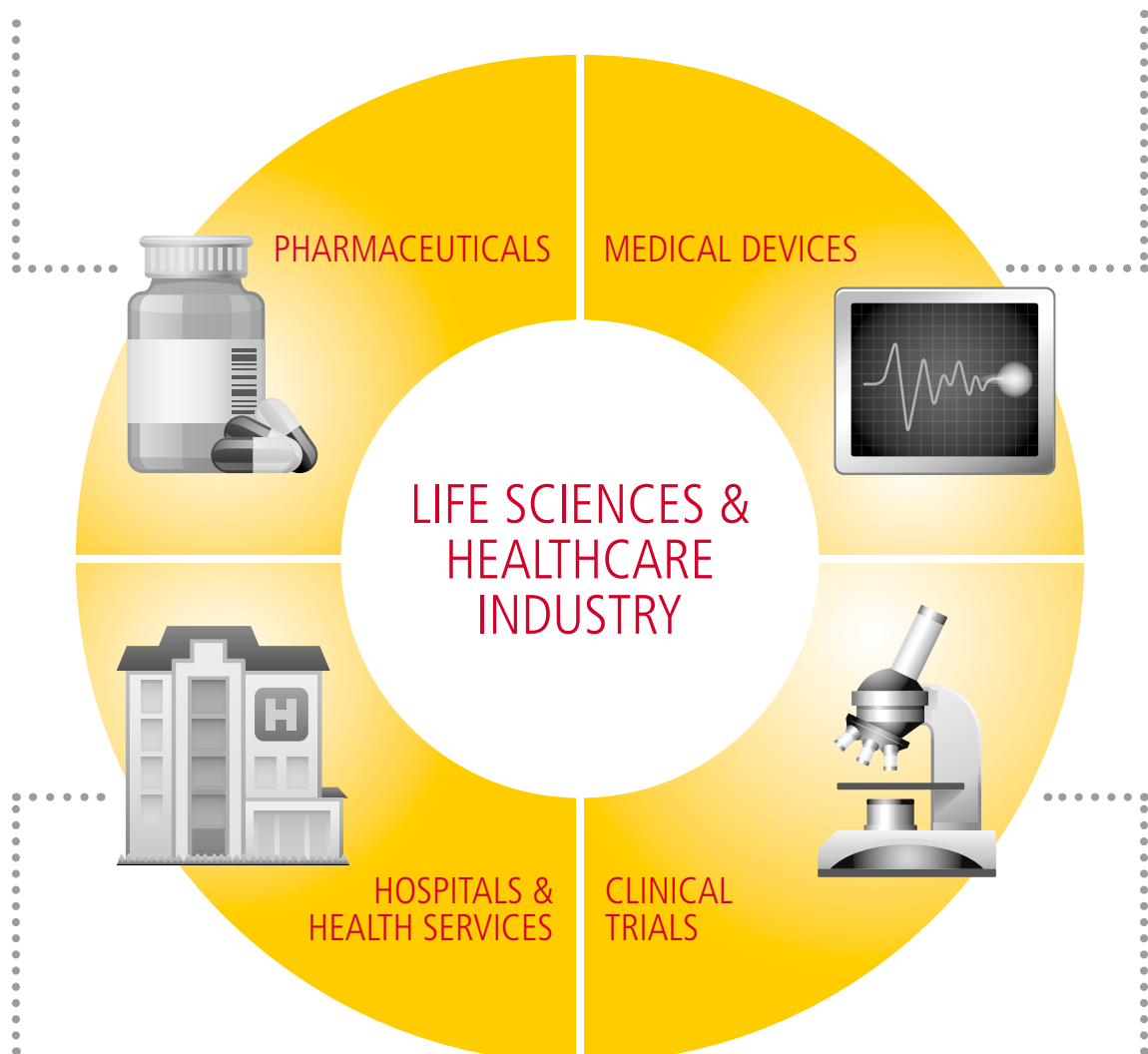
SUB-SECTORS AND THEIR SUPPLY CHAIN DYNAMICS

Pharmaceuticals

The pharmaceutical supply chain is complex. The channel to market, traditionally via wholesalers is increasingly focused on moving closer to the patient. Direct to market initiatives are improving sales effectiveness and addressing counterfeiting. The increasing focus on temperature assurance and regulatory requirement to have data available, place additional demands on the supply chain.

Medical Devices

Diverse products ranging from implants to capital equipment, consumables to diagnostics have specific supply chain needs. Manufacturers operating across multiple segments have different requirements for each supply chain, adding to complexity.



Hospitals & Health Services

With 80% of global healthcare costs in services (rather than products) improving hospital supply chains (public and private) is a key driver for overall healthcare expenditure. Examples include traffic around inner-city sites which has significant logistical impact, the high cost of internal space within hospitals and poor design for efficient logistics. Large numbers of discrete items means tracking of inventory is complex, in many cases with limited systems.

Clinical Trials

Clinical Trials timelines are tight and achieving them is crucial to meeting patient recruitment targets. DHL's experience is that 30% of trials are chilled, 70% include monitoring and most are global or regional creating additional challenges. Visibility of inventory through the supply chain, including status and condition, has the potential to improve decision making and reduce costs.

OUR SUPPLY CHAIN SOLUTION

We provide unrivalled heritage and capability in compliant, specialist supply chain solutions to the global healthcare industry.

Within our life sciences and healthcare offering we have dedicated teams who specialize within the following areas: Pharmaceutical, Medical Devices, Hospitals & Health Services, and Clinical Trials.

Our extensive experience of supplying logistical solutions to the life sciences and healthcare sector has enabled us to develop specific expertise in the following areas: Vaccines, Generic Pharmaceuticals, Biotechnology Products, Over The Counter (OTC) Medication, and Animal Health. For each of these areas we have experts working with our customers to optimize their supply chains.

We adopt a three stage process to provide customers with sustainable supply chain solutions.

1. Research into the specific challenges within the customer's supply chain, be they acquisition, space constraint or strict temperature requirements.
2. Network and service design to deliver the right network for the current and projected business and specific requirements such as late stage customization or development of new services.
3. Implementation of the business and on-going operational management including improvement processes. This has proven to deliver real benefits to customers in national, regional and global supply chains.

Pharmaceutical

We provide complete supply chain solutions to pharmaceutical customers, from strategic services such as consultation and network design, to warehousing and

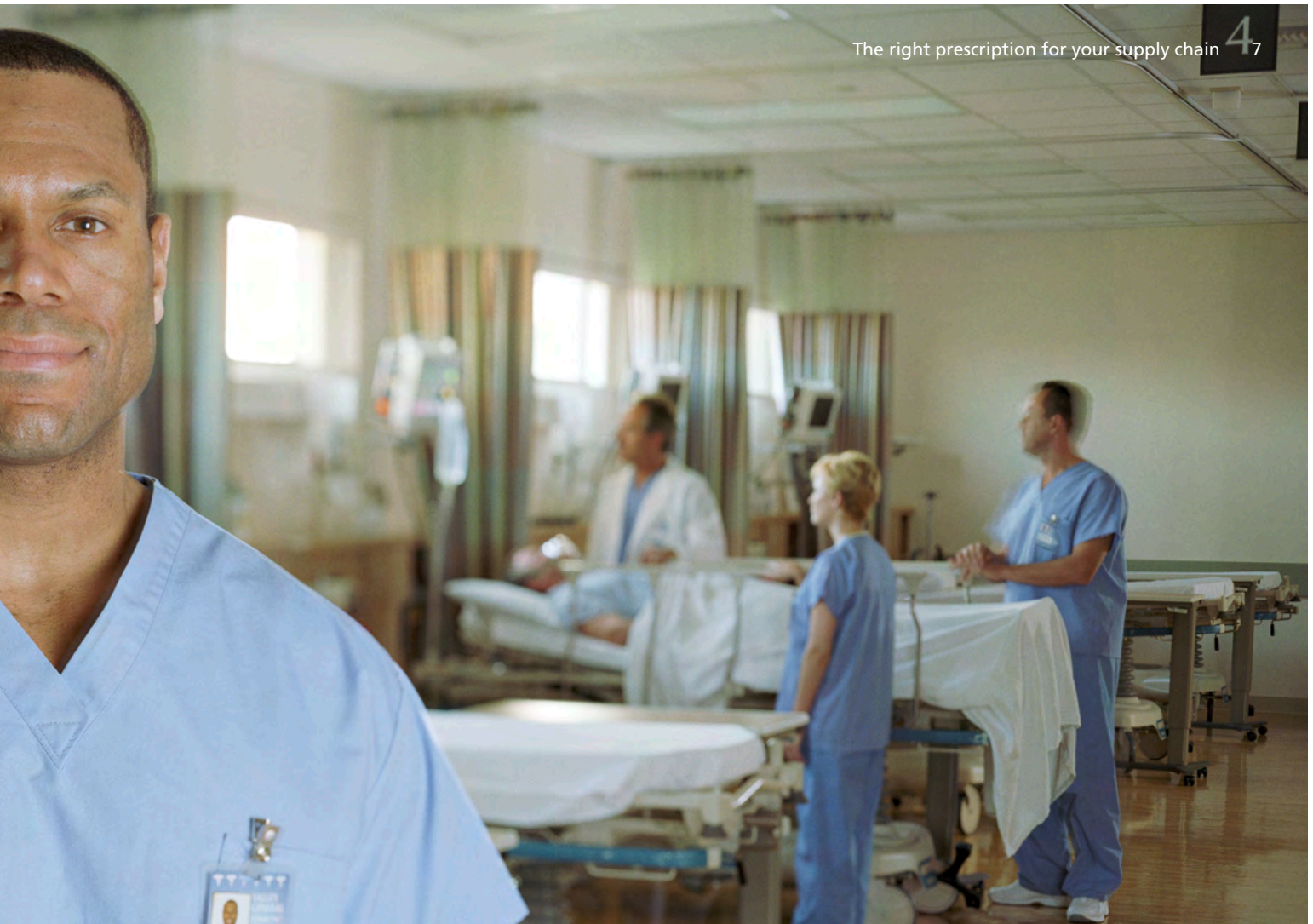


transportation. DHL is providing additional services to pharmaceutical customers including manufacturing, packaging, product customization, direct delivery and cash collection. Our broad reach allows us to help customers to enter new markets and have the confidence that quality assurance and regulatory requirements will not be compromised.

Within this business unit, specialist teams offer specialist solutions. We have a deep experience of products that are more challenging to distribute such as vaccines and biologics, and we are able to meet the challenges of seasonal supply, pandemic planning and temperature monitoring across the globe. We can also assist generics manufacturers at key times, such as product launch.

Medical Devices

We are able to support medical devices manufacturers in the strategic design of their supply chain with services such as consultancy, network design and operating as a Lead Logistics Provider to deliver transformational improvements. We provide our customers with a comprehensive suite of capabilities to support the needs of their customers across both mature and emerging markets. These range from multi-market (regional) warehousing and manufacturing / late stage customization to inventory



management and assurance of supply for loan kits, instruments and high value capital items.

We understand and support the logistical requirements of a diverse range of products, from implantable devices to diagnostic agents. We also offer additional services such as direct to patient delivery and reverse logistics to handle returns as required.

Hospitals & Health Services

We have provided logistics services to hospitals and health services for over 10 years, and manage the largest healthcare supply chain contract in the world, worth over €1.5bn annually. We support health services and hospitals in the strategic design of their supply chain with services such as consultancy, storage and inbound area redesign and operating as a Lead Logistics Provider (managing a range of providers) to deliver transformational improvements. In terms of delivery, we offer a range of services from warehousing (through off site consolidation) and cross docking to on site logistics and procurement, as well as more specialist offerings such as patient transport and inventory / materials management. We are committed to helping healthcare providers get maximum efficiency from their supply chain, and we are continually developing new services and capabilities.

Clinical Trials

DHL is the only third party logistics company providing integrated solutions in the clinical trials sector and has over 15 years' experience in the area. Our offering is supported by 20 specialist clinical trials depots providing distribution to over 80 countries, as well as a community of over 100 global experts in clinical trials logistics.

We understand the requirements of the clinical trial supply chain with its strict regulatory environment, demanding temperature controls and requirements for the highest standards of quality, visibility and security. We have delivered substantial reductions in distribution costs and inventory to our clinical trials customers through the implementation of supply chain visibility tools combined with network optimization. We also have an improvement focus which means we are continually looking to new ways to maximize efficiencies.

Our extensive reach and depth of expertise allows us to help our customers to access new markets, increase speed to market, increase supply chain visibility and reduce costs, while maintaining quality and regulatory compliance.

OUR UNIQUE CAPABILITIES

We have been at the forefront of innovative supply chain solutions for the life sciences and healthcare industries for 20 years. Over this time we have developed our experience, capabilities, products and global footprint with a product range to meet the requirements of the industry.

Global footprint and industry expertise

With over 120 sites in 40 countries and 4,500 dedicated healthcare staff, serving 250 life sciences and healthcare customers worldwide, we're always there to offer a safe pair of hands. We have the scale and experience to implement healthcare logistics solutions across the world.

Our unrivalled global capability and experience in emerging markets help you to access new growth opportunities and conduct effective operations. With DPDHL group operations in over 220 countries and territories, combined with our financial strength, we have the flexibility to scale up or down to meet requirements.

Commitment to excellence

Process Improvement is key to our operations. Through a structured and systematic approach the DHL DMAIC process (Define, Measure, Analyze, Improve and Control), which uses Six Sigma and Lean methodologies, we continuously improve standards. Our relentless pursuit of excellence gives you a real and sustained competitive advantage.

Quality and regulatory compliance

With our Global Quality Assurance group of over 100 individuals driving operational consistency and governance we're always up to date with the latest changes in local and international regulations. Our global network provides highly controlled environments and we ensure full GxP (Good Practice) compliance from origin to destination. This is underpinned by "DHL's LSH Rules and Guidelines" a compilation of worldwide regulations and practices that is the basis of our operations.

Cold chain and temperature assurance

We store and transport medical and pharmaceutical supplies at temperatures that include deep frozen, chilled and controlled ambient. We understand that replacing even one case of critical products is no easy task. That is why we've developed disciplined temperature controlled procedures to protect these valuable items; Packaging and shipment preparation areas are within controlled environments and we use innovative packaging materials to ensure temperatures are maintained throughout the chain of custody.

Health, safety and security

We help you achieve high standards on health, safety and security through extensive training and timely monitoring. We offer consulting on global safety regulations and conduct regular inspections and process audits of our facilities.





SUPPLY CHAIN SOLUTIONS FOR LIFE SCIENCES & HEALTHCARE INDUSTRY

▶ **PLAN**
Laying the foundation



Supply Chain Planning

Supply Chain Consulting (SCC)

By understanding and anticipating your business and logistics needs in an ever-changing environment, our teams provide a reliable source of expertise. We can provide you with advisory and/or consulting services, for example, an in-depth analysis of all network flows and supply chain processes across your organization in order to re-engineer and develop an optimized supply chain.

Lead Logistics Provider (LLP)

We build performance-driven partnerships with our customers. As a single logistics partner, we take over responsibility and accountability for the design, management and optimization of end-to-end-supply chains. We help our customers create competitive advantage and provide them with strategic, financial and commercial value by improving control, visibility and flexibility.

▶ **SOURCE**
Getting the materials you need



Inbound Logistics

Procurement Services

We provide sourcing and procurement services, leveraging economies of scale to drive down costs and improve margins. From the initial consulting and demand planning to negotiation, buying, tracking receiving and incoming inspection.

Inbound to Manufacturing

We take responsibility for optimizing all inbound transportation. We collect the right materials (e.g. API, ABI, excipients) from multiple suppliers at the right time giving you the confidence that deliveries will be in synch with your production schedule. We provide full warehousing solutions together with local shuttle service and in-plant movement of materials. We support lean manufacturing through tighter control, visibility and improved resource efficiency.

▶ **MAKE**
Manufacturing the products



Manufacturing Logistics

Serialization, Postponement and Packing Services

We operate a network of GMP facilities worldwide providing a range of assembly-based services. This allows responsiveness to country and customer demands and product evolution during the lifecycle. Assembly, packaging services and kitting ensures that products have the correct specification for the market and enables postponement or late customization. In addition we undertake customer specific presentations, serialization or labeling as well as the assembly of kits comprising pharmaceutical, medical devices and consumables.

Rework Services

Rework enables reconfiguration to meet changing requirements, such as content changes to leaflets, additional labelling (such as 2D bar-coding to support e-pedigree) and re-labeling for products being redeployed to different markets based upon changing demands.

▶ **DELIVER**
Getting it where it needs to be



Distribution Logistics

Home Healthcare

We provide direct to patient services based on core logistics activities plus kitting, patient and equipment management. The service is customized to meet the requirements of terminal, long term, recovery and episode care.

Order to Cash

Enables direct to market channels and new market entry, to improve sales effectiveness and build closer relationships with customers and patients. Our solution involves order management, fulfillment and receivables through an integrated IT solution and customer service centers.

Promotional Logistics

We offer fast availability of marketing materials through web-enabled ordering and operations include assembly, rework sample of samples and returns management.

Clinical Trials

We manage the outbound distribution of clinical supplies and the inbound flows of returns, including network design, study management and managed transport. Our global network solution of 20 depots supports global /regional outsourcing.

Pandemic

We provide core logistics processes supported by specialist activities, enabling governments and manufacturers to minimize the impact of a pandemic through availability of standby resources and rapid deployment.

▶ **RETURN**
Receiving support when it's needed



Aftermarket Logistics

Reverse Logistics

We offer the management of customer returns including arranging collection, logging, quarantine storage and inspection. We also support product recalls including dispatch data, arranging collections, quarantine storage and certified destruction. This service extends across pharmaceuticals, medical devices and reusable instrument kits.

Envirosolutions

We design and manage waste recycling solutions, integrated with existing logistics flows, which consistently reduce cost and environmental impact.



OUR SUPPLY CHAIN SERVICES

Continuously evolving and improving, our wide-ranging solutions help organizations to address their most complex, pressing operational needs from transportation to management services.

WAREHOUSING SERVICES

Creating and operating customized warehouse solutions that deliver bottom-line benefits is at the heart of all our solutions.. We offer warehousing to meet the requirements of each customer.

Multi-User Warehousing – multiple customers sharing the same physical platform and the same process; it's a scalable, repeatable solution with synergy benefits providing better cost, service and quality. Typically this is most effective for emerging markets and smaller overall operations where a standard or menu driven service offering is appropriate.

Shared-User Warehousing – several customers sharing the same physical building but with segregated areas and dedicated teams; we implement a customized solution for each customer. The costs of the site are shared (e.g. security, local functions) and labor can be transferred to accommodate peaks in demand. This is most effective for the larger customers in the developed markets.

Dedicated Warehousing – a dedicated facility with very limited sharing of cost between contracts and operations; most effective for larger customers with specialist operations or where location is key for historical, manufacturing or tax efficiency reasons. Where possible we use the benefits of a campus solution to share some services, such as quality control, IT infrastructure and security. In many cases dedicated facilities form part of a regional or global solution where DHL has an input into designing and implementing the optimal supply chain.

Multi-Market Hubs – we operate multi-market hubs in a range of geographies linking warehousing capabilities with managed transportation, import / export expertise, documentation preparation and value added services (in particular assembly and late customization / postponement). This enables regional distribution of pharmaceuticals and medical devices in parts of EMEA, APAC and the Americas. With this model we distribute ethical pharmaceuticals, biotechnology products, generic medicines, investigational products / clinical trials materials and medical devices – some hubs situated within free trade zones or with bonded areas to delay tax and duty payments.

TRANSPORTATION SERVICES

From needles and bandages to MRI scanners we have the specialist skills to move your products ensuring visibility and product integrity in cold chain and international temperature assured freight.

Managed Transport – our managed transport solution provides transparency, consistency of performance and operational efficiencies leading to improved service for your internal and external customers. The solution provides an independent centralized transport management function which improves visibility, communication, performance management supplier rationalization and compliance.

International Transport – we work closely with transport providers within the DPDHL group, including Global Forwarding, Freight (including the LTL Cool Chain service), Express and Same Day as well as specialist transport





providers outside the group. Typically the solution is designed by DHL Supply Chain in conjunction with other parts of the business and services include active and passive temperature controlled packaging systems for temperature sensitive products.

Domestic Transport – we operate our own transport fleet in many countries for FTL (Full truck load) and LTL (less than truck load) services, in most cases with controlled ambient (15-25°C) and refrigerated (2- 8°C) temperature zones. In some cases this service is also extended to parcel movements and direct to patient (home delivery) or operated in conjunction with other DPDHL group companies to provide a full domestic solution.

Patient Transport – We provide non-emergency patient transport services with the highest level of patient care based upon medical need. The drivers, coordinators and managers have been recruited to meet the needs of patient and hospital, providing an efficient and caring service. This is coupled with a bespoke booking system and implementation program.

MANAGEMENT SERVICES

Labor management – labor represents 50% to 60% of typical distribution costs. DHL Supply Chain's labor solutions help you manage these costs and improve the capabilities of your human capital. Our approach combines labor-management technology, engineered productivity standards, comprehensive operating practices and performance recognition while our scale and expertise

allows us to bring qualified and experienced life sciences resources to the task just when you need them most.

IT management – whether you require a new solution or integration into your existing system, we design, implement and validate global IT and project management solutions to match your needs and bring consistent, high-quality, cost effective IT services to your supply chain. Through experience of working with major systems (Oracle, Red Prairie, SAP, Manhattan etc.), we understand how to optimize IT solutions and consistently review and deploy new capabilities as they come on to market.

Real estate management – a well-executed real estate strategy can make significant contribution towards meeting your operational requirements and financial budget. Real estate plays a vital role in supply chain strategies, as nearly every warehousing or distribution center decision features a real estate component. Whatever and wherever your market, we bundle real estate and logistics services to offer a single-sourced comprehensive solution that reduces end-to-end supply chain cost, minimizes risks and improves efficiency.





UNRIVALLED HERITAGE AND EXPERTISE

We'll continue to listen to your needs and innovate with new markets and products to ensure you have a sustainable supply chain for the future.

Our track record and dedicated industry experts give DHL an unrivalled pedigree across the life sciences and healthcare industries, helping us to provide specialist, high quality solutions whatever your business.

We see each industry sectors with its own unique challenges. This drives us to listen when developing solutions, but also enables us to innovate by transferring expertise and experience from other sectors. As a global business we see growth in the developing markets of BRICM and across Asia and LATAM as well as production shifts and increased challenges of traceability (through e-pedigree), security and temperature.

Finally we see a considerable challenge with expiring patents and the need to innovate for ethical pharma, new channels with direct to pharmacy models, the move towards personalized medicine as well as continued consolidation in the industry and an increased focus on operational efficiency and effectiveness within health services and hospitals.

Our business approach is straightforward; we spend time understanding your requirements through discussion. We then use our life sciences and healthcare expertise to ensure that we address all of your business challenges, critical success factors and deliverables to develop the right solution for you. Once agreed, we implement this using our project management process (DePICT), run the operations using our quality rules and guidelines, process flows and procedures underpinned by our IT systems and drive improvement through our DMAIC processes.

In summary, we offer the expertise to understand your business and the capabilities to work with you to develop, and implement, the solutions which will deliver real benefits. We have an extensive range of products and capabilities which can be scaled and replicated to meet your needs.

We have an unparalleled infrastructure of accredited facilities as well as alignment across the other DHL business units (Freight, Global Forwarding, Global Mail and Express) to enable us to deliver integrated solutions. This is underpinned by validated systems, processes, implementation experience and our quality framework to ensure success.



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