Logistics, as Intervention to Secure the Supply of Medicines to Healthcare Facilities by Pharmacies and other Drug Manufacturers and Suppliers

M. Herold (Mark Herold)[1], E. Kalavsky (Erich Kalavsky)[2]

Original Article

[1] Reginal Pharmacy and SERU PhD Puiblic Health programme, Braunschweig FRG, DE.
[2] SEUC PhD programme in Health Management and Public Health Arkapo Pharmacy center, Munich, DE.

E-mail address:

herold@arkapo.de

Reprint address:

Mark Herold
Reginal Pharmacy and SERU PhD Puiblic Health programme
Braunschweig FRG
Deutschland

Source: Clinical Social Work and Health Intervention *Volume: 11* *Issue: 2*
Pages: 45 – 49 *Cited references: 12*

Reviewers:

Gabriela Lezcano
San Francisco, CA, USA
Mageswaari Rajoo
Bangkok, Thailand

Keywords:

Healthcare. Drug Manufacturers.

Publisher:

International Society of Applied Preventive Medicine i-gap

CSWHI 2020; 11(2): 45 – 49; DOI: 10.22359/cswhi_11_2_09

Abstract:

Globalization, expanded product portfolios due to acquisitions and new requirements for products and services have dramatically changed the supply chains in the pharmaceutical industry in general, but also pharmacies in particular, in recent years. In addition, digitalization opens up new opportunities, but poses major challenges for the logistics of required medicines. Hygiene standards, avoidance of supply bottlenecks and rapid supply must be guaranteed, especially in healthcare facilities such as hospitals, retirement homes and nursing homes. Especially in these facilities, a supply of appropriate medication is often vital for survival.

Introduction:

A secure and cost-effective supply of necessary or desired goods is the goal of both the consumer and the supplier. Globalization, expanded product portfolios due to acquisitions and new requirements for products and services have dramatically changed the supply chains in the pharmaceutical industry in general, but also pharmacies in particular, in recent years. In addition, digitalization opens up new opportunities, but poses major challenges for the logistics of required medicines. Hygiene standards, avoidance of supply bottlenecks and rapid supply must be guaranteed, especially in healthcare facilities such as hospitals, retirement homes and nursing homes. Especially in these facilities, a supply of appropriate medication is often vital for survival. The reason for this is the age structure and state of health of the customers. In order to maintain this supply, the responsible body must deal with the distribution of the logistics of important medicines. Distribution logistics therefore takes care of supplying customers with the desired and required medicines and. focuses on the distribution and availability of saleable medicines. It forms an interface between marketing and sales.[1]

Drug distribution logistics

Distribution itself is described as „the macroeconomic distribution of the objects of distribution (goods, services, rights, fees, information). In practice, the (narrower) terms sales, distribution and sales are used more frequently. Usually, distribution is defined as all processes between producers and traders up to the final customer in the sales channel. Redistribution refers to the processes from the consumer/consumer via dealers to the return of goods, recycling or disposal.[2]

The distribution channel is „the part of the distribution system designed by the manufacturer to ensure the sale of his products/services and the distribution of the necessary information.

Important decisions are: the number and type of stages of the distribution channel, the number and type of distribution bodies involved at each stage of the distribution chain and the organisation of cooperation between the individual elements of the distribution channel."[3]

Distribution logistics forms part of the logistics chain and is part of the distribution policy, which together with product policy, communication policy of pricing policy and delivery conditions form the marketing mix. However, before goods are procured, they must either be taken from the assortment or ordered externally. To do this, the assortment of your own pharmacy must be planned and, if necessary, topped up. Assortment planning comprises several levels:

- with regard to the contents of the assortment
- to the extent
- On the composition of the assortment with regard to the concept for assortment marketing

How the content of the assortment is compiled, i.e. which products are included in the assortment, depends mainly on

- Origin
- Price range
- Demand
- Suitability of the special operating forms off. The composition itself can be arranged according to various characteristics, for example according to raw materials (leather, fabric) or according to
- buyer-dependent requirements, e.g. fishing equipment
- Special needs related to the region, e.g. hunting needs
- complementary aspects, e.g. washing machines
- Compensation aspects to compensate for fluctuations in sales, e.g. tennis articles
- Price range
- Self-sellability, i.e. goods that the customer can put together himself, e.g. food.[4]

[1] Vgl. Koether, Reinhard: Distribution logistics: Efficient delivery security, 2012, 2014, Wiesbaden, p.3

[2] Springer Gabler Verlag: Gabler Wirtschaftslexikon, keyword distribution, (22.02.2016) viewed at: http://wirtschaftslexikon.gabler.de/Archiv/56409/distribution-v10.html [29.03.2020]

[3] Springer Gabler Verlag: Gabler Wirtschaftslexikon, keyword distribution, (22.05.2016), http://wirtschaftslexikon.gabler.de/Archiv/1216/absatzkanal-v8.html [25.03.2020]

[4] Vgl. Corbat, Peter: Logistics in sales companies, 2009, Norderstedt, p.61

The aim of assortment planning is to increase the performance of the overall assortment.[5] Especially pharmacies, but also manufacturing pharmaceutical companies have to deal with the quantity, the medicines produced or to be stored. Quantity planning „determines the material requirements (requirement for assemblies, parts, materials, and so on) from the production program using the BOMs. The independent requirements determined in production planning are exploded using the BOMs stored in the system or by mathematical statistical procedures (dependent requirements)".[6]

Article or material master data is normally used for quantity planning, whereas product structure data is used for bills of material. Quantity planning can be divided into requirements determination, procurement calculation and inventory management.

Requirements determination is a calculation-intensive process that is usually computer-controlled. Since in quantity planning, requirements are calculated by date, assembly and procurement times must always be included in the calculation. Various methods are used for this, such as:

- Deterministic determination of requirements (here the bills of material are the basis for the calculation)
- Stochastic determination of requirements (based on expectation and consumption-oriented procedures and assuming a minimum stock level)[7]

Inventory management forms the basis for quantity planning.[8]

Bills of material play an important role, especially in the manufacturing industry, as they take on a form of information processing. Depending on the production process, a distinction is made between:

- Quantity Bills of Material
- Modular parts lists
- MRP parts lists
- Structure Bills of Material [9]

and are needed in the following area:

- in the construction for the design and product definition
- in the control of products for material management and the programming and selection of manufacturing technologies
- in product procurement
- in the calculation of offers as a basis for cost accounting.[10]

In addition to the planning and procurement of goods – in this case especially medicines - these must also be brought to the customers. This is the responsibility of so-called transport logistics. Transport logistics means „the holistic view of all the working and information methods necessary for a transport process".[11] This includes the interaction of:

Administrative variables such as transport, vehicle or personnel administration

- Operational variables such as control or strategies in transport
- Disposable variables such as transport technolog[12]

The task of transport logistics is the provision and management of goods in the internal production process at the lowest possible cost. Transport logistics is geared towards the goal of optimising transport in terms of unloading, loading, capacity utilisation, handover and identification.

But transport alone does not make for good logistics. The storage of medicines and, if necessary, new production also play an important role in the supply process. Warehousing is understood to be the storage of the material. Warehousing is part of materials management and

[5] Vgl. Corbat, Peter, 2009. p.61

[6] Wenzelmann, Christoph/Plass, Christoph/Gausemeier, Jurgen: Future-oriented corporate design: strategies, business processes and IT systems for the production of tomorrow, 2nd edition, 2014, München, p.34

[7] Vgl. Cronjager, 1994, p.120

[8] Vgl. Cronjager, 1994, p.120

[9] Vgl. Vahrenkamp, Richard: Production management. 2008, Munich, p.130.

[10] Vgl. Vahrenkamp, 2008, p.130

[11] Martin, Heinrich: Transport and warehouse logistics: planning, structure, control and costs of intralogistics systems, 2014, Wiesbaden, p.97

[12] Vgl. Martin, 2014, p.97

serves as a buffer to compensate for fluctuations in the sales or purchasing market. The most important tasks of warehousing are therefore

- Prevention of possible supply bottlenecks, for example due to supplier strikes
- Speculation on profits due to possible rising prices
- Maintenance of capacity in order to be able to secure supplies in the long term
- Securing stability in order to achieve flow-free growth, which can be achieved by influencing private cash management, for example
- Securing sales, for example by storing rare or less common goods or commodities
- Generating an income, for example by taking over warehouse keepers for third parties[13]
- Warehouse logistics is the generic term which includes both the types of warehouses and the storage of goods. „Warehouse logistics has the task of designing systems for all types of storage, picking and conveying of goods from goods receipt through all stages of production or storage to goods issue“.[14] The better the logistics in the warehouse, the easier it is to access the appropriate medication. In today's world, everything happens automatically. This is achieved not least through digitalisation. So-called pharmacy robots and systems enable efficient inventory management, the optimisation of work processes and the improvement of patient safety. By using automated inventory management, which facilitates packaging, storage and picking, wholesalers in particular, but also manufacturers, can plan and produce more efficiently.[15] Hospitals can also benefit from this to keep a better overview of their own stock. Software solutions for drug supply can be particularly worthwhile for these facilities. The software manages the stock of medicines and thus helps to keep an overview of the entire warehouse. A cross-system stock overview „enables costs to be controlled and the disposal of expired medicines to be avoided by optimising purchases and replacing medicines with a short shelf life.[16]
In addition, automated drug storage and picking processes help reduce dispensing and dosing errors, "while creating more efficient workflows."[17] In addition to automation, is also the disposal of expired drugs. This is a challenge not only for hospitals, but also for manufacturers, pharmacies and other health care facilities, because for a long time the disposal of goods, including medicines - although a key factor in economic processes - was ignored. This deficit was eliminated by internal and external processes. As a result, waste disposal no longer has a cross-sectional function, but is now integrated as a fourth part of logistics in the overall process. The following table explains waste disposal logistics in more detail:

Definition	Disposal logistics is a „scientific discipline that deals with the material flow optimization of internal and external waste streams“.[18]
Goals	In addition to avoidance, the optimisation criteria focus on the recycling of waste as well as the reduction of waste quantities, the use of disposal technologies that are environmentally compatible and the exploitation of the value creation potential that exists in waste.[19]
Taks	• Recording of waste streams • Optimization of information and material flows • Expansion of external and internal organisational structures.[20]

[13] Vgl. Albers, Willi: Handbook of Economics (hdWW): Warehousing to oligopoly theory, 1980, Stuttgart – New York, p.1

[14] Rupper, Peter: Corporate logistics, 1995, Zurich, p.353.

[15] Vgl. Martin, 2014, p.98

[16] Swisslog Healthcare (22.03.2020), Automation for central pharmacies, https://www.swisslog-healthcare.com/de-de/l%C3%B6sungen/zentralapotheken [29.03.2020]

[17] Swisslog Healthcare (22.03.2020), Automation for central pharmacies, https://www.swisslog-healthcare.com/de-de/l%C3%B6sungen/zentralapotheken [29.03.2020]

Illustration 1: Disposal logistics.[21]

With the help of disposal logistics, the manufacturer should solve the problems of avoiding, reducing and recycling waste. For a production company, responsibility refers to the entire life cycle of a product. This recycling management should help the consumer to minimize the consumption of resources or enable the product to be recycled as a secondary raw material.[22]

Disposal logistics therefore helps to avoid waste, dispose of medicines professionally and protect the environment.

Conclusion

As has been shown so far, logistics is complex on the one hand, but on the other hand it is also important in order to be able to supply health care facilities with the necessary drugs. However, in order to be able to supply them, all processes in the pharmacy as well as those of drug manufacturers and suppliers must be taken into account. Because if medicines are missing due to incorrect storage or unit invoicing, health care facilities must also wait for deliveries, some of which are vital, or even switch to other products. It is therefore evident that logistics only works if all areas of this are taken into account. Automated processes can help to avoid errors and thus save lives.

References:

1. ALBERS W (1980) *Handbook of Economics (hdWW): Warehousing to oligopoly theory*, 1980, Stuttgart - New York.
2. ISEMANN A D, KUHN H, TEMPELMEIER A, FURMANS H (2008) *Handbook Logistic*, 2008, Wiesbaden.
3. CORBAT P (2009) *Logistics in sales companies*, 2009, Norderstedt.
4. CRONJAGER L (1994) *Building blocks for the factory of the future: An introduction to computer-integrated production* (CIM), 1994, Wiesbaden.
5. KOETHER R (2014) *Distribution logistics: Efficient delivery security*, 2012, 2014, Wiesbaden.
6. MARTIN H (2014) *Transport and warehouse logistics: planning, structure, control and costs of intralogistics systems*, 2014, Wiesbaden.
7. RUPPER P (1995) *Corporate logistics*, 1995, Zurich.
8. VAHRENKAMP R (2008) *Production management*. 2008, Munich.
9. PLASS W CH, JURGEN CH G (2014) *Future-oriented corporate design: strategies, business processes and IT systems for the production of tomorrow*, 2nd edition, 2014, Munich.

Internet source:

10. SPRINGER GABLER VERLAG (2016) *Gabler Wirtschaftslexikon, keyword distribution*, (22.02.2016) viewed at: http://wirtschaftslexikon.gabler.de/Archiv/56409/distribution-v10.html [29.03.2020].
11. SPRINGER GABLER VERLAG (2016) *Gabler Business Encyclopedia, keyword sales channel*, (May 22nd, 2016), http://wirtschaftslexikon.gabler.de/Archiv/1216/absatzkanal-v8.html [March 25th, 2020].
12. SWISSLOG HEALTHCARE (2020) *Automation for central pharmacies,* URL: https://www.swisslog-healthcare.com/de-de/l%C3%B6sungen/zentralapotheken [29.03.2020].

[18] Quelle: Compiled afterh Arnold et al., 2008, p.487

[19] Vgl. Arnold et al., 2008, p.488

[20] Vgl. Arnold et al., 2008, p.487

[21] Quelle: Compiled afterh Arnold et al., 2008, p.487

[22] Vgl. Arnold et al., 2008, p.488