



## LOGISTICS FLOW IN HEALTHCARE

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### Abstract

The article deals with the issues of minimizing the doctor's costly actions through high-quality regulation of the medical and diagnostic process and the widespread introduction of economic regulators of the medical and diagnostic process into healthcare practice.

**Keywords:** healthcare logistics, medical facility, medical services, medical personnel, patient care, patient flow.

The special nature of the logistics approach in management and healthcare, is the special role that is assigned to the patient flow as an object of management. Unlike the key role of material flow in industrial production, the priority in initializing information, cash and other types of flows in healthcare, of course, belongs to patient flows. It should be noted that the concept of material flow is central to logistics. It generalizes the continuity of change and movement of the products of labor in the sphere of circulation and production. Logistics in healthcare is very important. Here the humanitarian nature is obvious and the relationship between the ability to provide assistance on time and the organization of material flows that determine the provision of this assistance is increasingly being investigated. Material flow can be considered as a separate spatiale phenomenon, in the process of which various logistics operations are applied to a certain material object that is the carrier of a goal or related activity in a set period of time. **A stream** is a collection of objects perceived as a single whole, existing as a process on a certain time interval, measured in absolute units over a certain period.

Logistics in healthcare is a very broad area of possible applications. Starting with those actions that affect the daily work of hospitals and polyclinics, creating conditions for high quality and inexpensive provision of medicines, food, medicines, operational materials, tools and personnel, and ending with the organization of organ or blood transportation. The logistics of blood resources, or more precisely, the logistics of managing blood supply chains throughout the country's healthcare system, is one of the newest areas of logistics development, focusing not only on direct blood supplies from the donor to the patient (through all elements of the chain), but also on optimizing blood supplies based on the substitutability of groups, and the issues of blood supply network management systems.

Characteristics of the behavior of consumers of medical services, reflects some passivity while waiting for service in a medical institution, which is typical for traditional logistics. In service logistics, patients themselves are active, forming a flow that is decisive in the aggregate of economic flows of medical institutions. In this case, service providers (medical personnel) are also very active.

At the same time, the so-called additional flows in relation to the main ones can have not only a preliminary, but also a subsequent character, if medical services are paid in advance.



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In service logistics, financial flows originating from consumers (patients) are additional and are of great importance for direct service, i.e. service consumption. Patient flows to medical services are accompanied by financial flows and information flows that take different forms depending on the specifics of the service.

The formation of patient flows is usually carried out in a planned manner. The flow management plan should provide services for each group of patients receiving medical care in outpatient and inpatient settings, with an assessment of financial resources. Separately, it is necessary to make a detailed cost analysis for a group of complex resource-intensive diseases. During the development of plans, the following types of work are carried out: collecting information on the compared treatment and prevention facilities; making adjustments to the volume of medical care; studying the existing patient flows and analyzing options for optimizing them in terms of resource use; selecting and approving rational options.

Polyclinic doctors should be involved in planning the volume of inpatient care. They should periodically assess the amount of hospitalization required and the approximate length of stay of patients in hospitals, eventually reaching the preliminary request for a certain number of bed days. This means that polyclinics are prepared in advance they plan the number of bed days for their patients with a guarantee of payment for the agreed volumes of hospitalizations based on the cost of completed treatment cases. A preventive action plan should be an integral part of organizing patient flows. At the same time, it is necessary to estimate the costs of their implementation and the economic effect. A special place in the plan of organizing patient flows is given to the program of work with the elderly and disabled population.

This part of the program should be linked to the social protection authorities. One of the ways to improve the quality of healthcare is to introduce an annual medical examination of the entire population. The decision to hold this event in the past years testified to the high level of development of our healthcare system, its high material and technical equipment and availability of labor resources. Currently, for the modernization of healthcare, the need for rational use of resources involved in various patient service flows is taking on an innovative meaning. Innovations aimed at improving the efficiency of resource use should be carried out taking into account their medical, economic and social efficiency. To mobilize the existing reserves, it is necessary to increase the level of economic work, using modern methods of managing the flow of resources and improving the remuneration system for employees of medical organizations.

Healthcare logistics is focused on patient flow modeling. Let's look at how it helps improve the schedule of doctors in hospitals. The development of the clinic's doctor-patient scheduling system will help doctors test different versions of their schedules and see how appointment schedules affect the clinic's performance. Another model can be developed using the Process Modeling Library. With its help, it was possible to analyze several options for improving the level of training of medical staff, of emergency doctors, and so on. Even from the model, to solve the problems of patient congestion (the so-called "queue theory") in emergency departments. The results of experiments with the model will help



determine the capacity of emergency departments and make better use of human resources in the hospital.

Modeling the use of medical resources makes it possible to test different hospital configurations in what-if scenarios. The built simulation model can also be used for other medical centers.

Statistics obtained from experiments with simulation models help assess the. This allows you to determine the acceptable throughput.

This is based on the AnyLogic program, which allows you to develop detailed models for making sector and evaluate the effect of introducing new technologies, such as reanimobiles. It is based on the relationship and integration of transport, storage facilities, procurement and distribution of goods, information and innovation logistics.

Based on the logistics model, the main conditions for implementing a logistics management system can be formulated: 1. Parameterization of medical institution flows and their monitoring; 2. Determining the regularities of the functioning of the production environment based on the regulations; 3. Determination of points for dispatching streaming traffic in order to improve the quality of operational management; 4. Selecting a solution option based on comparing flow parameters with the state of frames, technologies used, and resources in a specific area of the production environment.

From all this, we can draw the following conclusion:

1. Using the logistics approach, it is possible to identify structural divisions of the institution where problem situations may arise.
2. Effective management of flow traffic in these places requires the organization of control points, a strict system of staff labor rationing, detailed and adequate regulations of activities that will ensure the dispatching of flows based on the selected parameters.
3. Effective operational management can serve as an objective basis for developing a marketing strategy and policy of a healthcare institution, make it possible to purposefully plan the work of offices and staff, determine priorities in the order of technical re-equipment of workplaces, etc.

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