Application of HIS-Based Medical Consumables Management in Nursing Management of Stomatology Department: A Postprint

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Abstract

The management of dental consumables is complex and presents significant challenges. This study summarizes the development and application of a medical consumables management system based on the Hospital Information System (HIS), covering system composition, operation interface, operational procedures, and system advantages. By enabling scientific, effective, and accurate management of dental medical consumables, the system conserves human resources and improves work efficiency.

Full Text

Application of HIS-Based Medical Consumables Management System in Nursing Management in the Department of Stomatology

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Abstract

Stomatological consumable inventory management is notoriously challenging. This paper summarizes the development and application of a Hospital Information System (HIS)-based medical consumables management system in the nursing management of the Department of Stomatology. We analyzed the system's components, operator interface, operating procedures, and advantages. The HIS-based medical consumables management system enables scientific, effective, and accurate management of stomatological medical consumables, thereby saving human resources and improving work efficiency.

Keywords: Department of Stomatology; Hospital Information System; management; medical consumables

The Department of Stomatology utilizes a wide variety of clinical materials. According to surveys, there are at least [number missing] types of medical consumables currently in use, making management extremely difficult and procedures cumbersome. The supervision and management of processes such as consumables warehousing, storage, and issuance are generally coordinated by the head nurse. How to manage medical consumables scientifically, effectively, and accurately is a key focus of nursing management in stomatology. The Hospital Information System (HIS) is an important emerging branch of medical informatics that provides information services for all hospital departments and meets the functional needs of all authorized users [citation missing]. In [year missing], the Department of Stomatology at Peking Union Medical College Hospital continuously explored and improved its practices. Based on the current status of consumables management in stomatology and modern information technology, an expert team was formed comprising nursing managers, software engineering experts, and clinical nurses to independently develop an HIS-based medical consumables management system. This paper summarizes the development and application of this medical consumables management system to provide a reference for further standardizing the management of medical consumables in stomatology departments.

1 Problems in Traditional Consumables Management

Traditional consumables management relies primarily on manual bookkeeping, which has the following limitations: heavy workload and low efficiency; inaccurate inventory statistics, leading to unguided replenishment and waste; unplanned issuance due to ad-hoc requests; inaccurate statistics on individual and public expenditures by doctors; and inability to provide timely statistics on various consumables.

2 HIS-Based Informationalized Consumables Management System

2.1 System Composition

The consumables management system is divided into two main interfaces: a physician requisition interface and a nurse station inventory management interface. The physician requisition interface for stomatology materials comprises [number missing] modules, while the nurse station inventory management interface comprises [number missing] modules.

The physician requisition interface includes four modules: “Material Requisition,” “Material Return,” “Requisition Progress Inquiry,” and “Material Distribution Data Statistics,” which are simple and easy to operate [Figure 1: see original paper]. The material distribution module serves as the interface where

inventory nurses “generate distribution documents” and doctors “review return documents” after physicians create requisition orders [Figure 2: see original paper].

The nurse station inventory management interface contains several key modules. The procurement planning interface is used to create “procurement plan documents” while simultaneously allowing queries of “plan execution status” and “arrival status” [Figure 3: see original paper]. The inventory management module includes functions for “warehousing,” “returns,” and inventory transfers between parallel storerooms [Figure 4: see original paper]. The storeroom maintenance module encompasses maintenance of material information as well as information for requisition professional groups and physicians, enabling the head nurse to adjust physician requisition permissions according to departmental work arrangements [Figure 5: see original paper]. The inventory transfer module facilitates transfers between east and west campus storerooms. The inventory counting and query module provides dynamic storeroom queries, physical counting functions, and expiration date reminders for consumables [Figure 6: see original paper]. The statistical reporting module provides the department and head nurse with inbound/outbound queries, individual physician expenditure queries, and various monthly reports [Figure 7: see original paper].

2.2 System Operation Process

Monthly procurement plans are formulated based on inventory upper and lower limits. The procurement plan is developed according to the previous month’s actual inventory consumption and predetermined inventory limits, using natural months as the unit. After approval by the department director, the plan is submitted to the hospital equipment department for procurement. Upon arrival of consumables, the entire shipment can be warehoused at once based on the planned varieties and quantities without manual entry of each item. When only partial shipments arrive, inventory nurses can also select partial warehousing based on actual arrival conditions. For consumables with expiration date requirements such as resins and silicone rubbers, the system prompts a dialog box requiring manual entry of expiration dates to complete the warehousing process [Figure 8: see original paper].

Requisition management begins when physicians submit requisition forms through their work interface, which immediately occupies inventory quantities as committed stock. Inventory nurses can view physician requisition content on the inventory management interface, and after verification, can save and print the requisition form. Physicians sign the paper documents to confirm receipt. The head nurse then reviews the content in the system based on paper documents, at which point inventory quantities are actually deducted. Physicians can adjust requisition content before head nurse approval. Public expenditures are collected by designated nurses [Figure 9: see original paper].

Inventory transfer functionality is essential as Peking Union Medical College

Hospital's Department of Stomatology has two campuses (east and west), each with its own storeroom under unified head nurse management. Transfers between the two storerooms are sometimes necessary. Inventory transfers can be divided into demand-driven transfers and proactive transfers—one storeroom initiates a request and the other completes the transfer upon receiving the application, or a storeroom can proactively transfer to another. Transfer orders only occupy inventory when created; actual inventory quantities only change after the receiving storeroom accepts the goods and the transfer order is approved in HIS.

Expenditure statistics are calculated by natural month. On the last day of each month, the head nurse conducts unified accounting of expenditures for all physicians across both campuses, including individual and public expenditures.

The statistical function can be performed as needed by simply adjusting the date range, enabling calculations by month, quarter, year, or other periods. Statistics can also be generated by professional group or individual, providing flexible and reliable data for departmental cost accounting.

2.3 Permission Management

The head nurse possesses super-administrator permissions with access to all modules. Inventory nurses for the east and west storerooms are authorized by the head nurse based on work requirements, possessing basic permissions to independently manage their respective storerooms but lacking advanced permissions for consumables information maintenance or physician group authorization. Physician requisition permissions are set by professional group at the discretion of the head nurse, who establishes requisition quantities and types for physicians in each group based on annual averages and workload. Physicians can query inventory, types, prices, requisition history, and expenditure data for needed consumables at any time.

3 Conclusion

Since implementation, the storeroom management system has demonstrated significant management effectiveness in several key areas. First, it has greatly improved the accuracy of consumables counting and registration, enabling regular physical inventory counts and planned procurement based on actual stock, thereby substantially avoiding material overstocking and waste. Second, it has changed physicians' previous habit of unplanned requisitions by establishing fixed requisition times (twice weekly) and requiring timely submission of requisition forms, encouraging physicians to plan consumables usage and requisitions systematically. This has reduced the workload of inventory nurses in registration, material distribution, and documentation, saving human resources and improving efficiency. Third, it has provided timely and accurate management information, offering scientific and precise data for departmental cost accounting and performance evaluation. The inventory transfer function maximizes

inventory utilization and reduces waste from stagnant stock. The counting and inventory query module can track near-expiration consumables in real-time, reminding inventory staff to arrange procurement and usage reasonably to avoid waste from manual counting oversights and facilitating head nurse management.

The challenges faced in traditional nursing management have prompted managers to adopt corresponding countermeasures, enabling more scientific and efficient task execution that relies on smooth information transmission and standardized process operation, thereby improving work outcomes and allowing managers more energy to enhance themselves and lead their teams to create greater value [citation missing]. Information management represents the development trend of modern nursing quality and safety management, yet the informatization process in stomatology nursing management has lagged behind. How to manage medical consumables scientifically, accurately, and efficiently is an issue that stomatology nursing managers must address. The medical consumables management system in this study accommodates the particularities of stomatology material management, allocates resources rationally, and enables medical staff to cope calmly with the growing workload of stomatology outpatient services and the opportunities and challenges of continuous development and advancement in stomatology nursing.

HIS-based medical consumables management has been formally incorporated into the hospital information management module. Through information management, we have achieved scientific, systematic, complete, transparent, and standardized management that integrates storeroom resources while facilitating clinical work, improving efficiency, avoiding waste from disorganized inventory, and increasing satisfaction among both medical and nursing staff. Scientific and accurate data information provides a correct and convenient support platform for departmental decision-making [citation missing]. With the diversified development of modern information technology, nursing personnel have become leaders in information design, fostering their proactive innovation and management capabilities while enhancing their sense of achievement and value.

As times progress and technology updates, medical consumables continue to optimize during use. For instance, standardization of basic information entry names was insufficiently unified, so a common name search function was added. Given the wide variety of bur types with similar models that are easily confused, a material image comparison feature was added to support picture-based searches, facilitating physician requisition. In the future, nursing managers will continue collecting clinical usage feedback to further improve the system, making it more convenient for clinical physicians and departmental statistics.

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Conflict of Interest Statement: The authors declare no conflict of interest in this article.

Note: Figure translations are in progress. See original paper for figures.