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2025 Volume 10, Issue 4
Journal of Medicines Development Sciences
ISSN: 2382-6371(Online) ISSN: 2382-6363(Print)

Analysis of the Impact of Comprehensive Drug Clinical Evaluation Thinking on Temporary Drug Procurement Management in Hospitals

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Abstract: *Objective:* To study and analyze the impact of comprehensive drug clinical evaluation thinking on temporary drug procurement management in hospitals. *Methods:* 394 temporary drug purchase applications in our hospital from January 2022 to December 2023 were selected as the research objects and divided into two groups according to time. January 2022 to December 2022 was the conventional management group (n=197), which adopted the temporary procurement management model of conventional drugs; January 2023 to December 2023 was the comprehensive thinking group (n=197), which adopted the comprehensive clinical evaluation thinking management model of drugs. Compare the purchasing decisions and categories of purchased drugs between the two groups. *Results:* The temporary drug purchase application rate and pre-audit failure rate of the comprehensive thinking group were lower than those of the control group, and the temporary purchase execution rate was higher than that of the control group. The difference was statistically significant (P<0.05). The hospitals' temporary drug purchases mostly included immunomodulatory drugs and anti-infective drugs. Among the drug categories purchased by the two groups, the purchase of anti-infective drugs, nervous system drugs, respiratory system drugs and special/other therapeutic drugs was statistically significant. The conventional management group was significantly higher than the comprehensive thinking group (P<0.05). *Conclusion:* The application of drug clinical comprehensive evaluation thinking in hospital drug temporary procurement management can effectively improve the scientificity, rationality and execution efficiency of procurement decisions, optimize the drug catalog structure, and improve the overall level of hospital drug management.

Keywords：hospital drugs; temporary procurement; thinking on comprehensive clinical evaluation of drugs

Online publication: December 26, 2025

1. Introduction

Hospital drug management is one of the core links of the medical service system. Its scientific and standardized nature directly affects clinical efficacy, patient safety and medical resource utilization efficiency. With the changes in the disease spectrum and the diversification of medical needs, the role of temporary drug procurement in responding to sudden clinical needs and the treatment of special cases has become increasingly prominent [1]. However, the urgency and complexity of temporary procurement often lead to significant flaws in the management process: the traditional model relies too much on experience-based decision-making and lacks systematic evaluation, which can easily lead to blind procurement, waste of

resources, and potential drug safety hazards. Globally, the problem of drug resistance in infectious diseases has intensified. The high burden of such diseases has directly driven the urgent clinical demand for related drugs. Against this background, how to optimize the temporary procurement process through scientific management has become a difficulty that hospital pharmacy management needs to overcome [2]. As a multi-dimensional decision-making tool, drug clinical comprehensive evaluation comprehensively evaluates the value of drugs from core dimensions such as safety, effectiveness, and economy, providing a theoretical basis for clinical drug use and procurement management [3]. However, existing research mostly focuses on routine drug catalog management, and there is insufficient exploration of the application of comprehensive evaluation thinking in temporary procurement scenarios. Traditional management models often only focus on drug supply timeliness and cost control, ignoring the matching of clinical value and individual patient needs, resulting in procurement decisions being out of touch with clinical reality. In addition, the sudden nature of temporary procurement makes it difficult for traditional review mechanisms to deeply evaluate the applicability and risk-benefit ratio of drugs, further exacerbating management blind spots [4]. The temporary drug purchase application forms of our hospital from January 2022 to December 2023 were selected as the research object to explore the impact of comprehensive drug clinical evaluation thinking on the hospital's temporary drug procurement management. The specific report is as follows.

2. Materials and methods

2.1. General information

394 temporary drug purchase applications in our hospital from January 2022 to December 2023 were selected as the research objects, and they were divided into two groups according to time. January 2022 to December 2022 was the conventional management group (n=197), which adopted the temporary procurement management model of conventional drugs; January 2023 to December 2023 was the comprehensive thinking group (n=197), which adopted the comprehensive clinical evaluation thinking management model of drugs.

2.2. Method

The routine management group accepts the routine management model: after the clinical department submits a temporary purchase application, the clinical pharmacist of the Pharmacy Department will conduct a preliminary rationality review based on the patient's current treatment plan and the historical purchase frequency of the drug. After passing the review, the application needs to go through a step-by-step approval process, and is finally approved and implemented by the relevant leaders.

The comprehensive thinking group accepts the thinking management model of comprehensive clinical evaluation of drugs: (1) Optimization of organizational structure and responsibilities: The hospital has established a multidisciplinary collaborative management team, covering the pharmacy department and the rational medication group. The Pharmacy Department is responsible for the design and execution of the procurement plan. The management team establishes a standardized drug review and evaluation system by analyzing problems in previous temporary procurement cases, and clarifies the priority and decision-making criteria for drug review. (2) Process reconstruction and quality control: After the clinical department submits the purchase application, the Pharmacy Department selects qualified drug suppliers and specifications based on clinical needs for confirmation by the clinical department director. The application must be pre-reviewed by the clinical pharmacist, reviewed by the director of the Pharmacy Department, and finalized by the Drug Selection Working Group of the Pharmaceutical Council, and the purchase will be completed by the Pharmacy Department. This model strengthens the pre-trial and follow-up evaluation mechanism: in the pre-trial stage, the safety, effectiveness, economy and individual needs of patients are comprehensively evaluated. For example, anti-infective drugs need to be combined with pathogenic test results and drug resistance profiles to analyze the necessity of medication; in the follow-up stage, by regularly tracking the clinical efficacy and adverse reaction data of purchased drugs, the hospital drug catalog is dynamically optimized to reduce repeated purchases and waste of resources. (3) Establish a professional review team

and implement the first-review responsibility system, that is, the fixed pharmacist is responsible for the entire review and follow-up of the same drug. The review team allocates management pharmacists according to drug categories, regularly summarizes temporary procurement data and makes suggestions for catalog optimization to ensure review quality and process closed-loop management. In addition, temporary procurement applications must follow the principle of "a single patient applies for the dosage of one course of treatment for the first time", strictly formulate procurement conditions based on clinical diagnosis and treatment needs and relevant laws and regulations in my country, and standardize the decision-making process from multiple perspectives such as necessity, safety, and cost-effectiveness. Through the above measures, we can achieve scientific and standardized management of temporary drug procurement, reduce the rate of unnecessary purchases, and improve the accuracy and execution efficiency of clinical medication.

2.3. Observation indicators

2.3.1. Procurement decision-making situation

Observe and compare the purchasing decision-making status of the two groups, including the temporary drug purchase application rate, pre-audit failure rate, and temporary purchase execution rate.

2.3.2. Categories of purchased drugs

Observe and compare the categories of purchased drugs between the two groups, including digestive system and metabolism regulating drugs, hematopoietic system drugs, cardiovascular system drugs, dermatological drugs, genitourinary system drugs, hormone drugs, anti-infective drugs, immunomodulatory drugs, musculoskeletal system drugs, nervous system drugs, respiratory system drugs, sensory organ drugs, and special/other therapeutic drugs.

2.3.3. Statistical methods

Our hospital analyzes and studies through the SPSS 21.0 statistical software package. The measurement data is expressed by ($\bar{x} \pm s$) and conforms to the normal distribution. The test is used for comparison between groups. The count data is expressed by relative numbers. The x_2 test is used for comparison between groups. The rank sum test is used for comparison of clinical efficacy. $P<0.05$ means that the difference is statistically significant.

3. Results

3.1. Comparison of purchasing decision-making situations between the two groups

The temporary drug purchase application rate and pre-review failure rate of the comprehensive thinking group were lower than those of the control group, and the temporary purchase execution rate was higher than that of the control group, and the difference was statistically significant ($P<0.05$). **Table 1**.

Table 1. Comparison of purchasing decisions between two groups [n(%)]

Group	n	Temporary drug purchase application	Pre-audit failure rate	Temporary procurement execution rate
Comprehensive thinking group	197	79 (40.10)	13 (6.60)	179 (90.86)
General management group	197	121 (61.42)	39 (19.80)	136 (69.04)
x^2	-	17.913	14.977	29.275
P	-	<0.001	<0.001	<0.001

3.2. Comparison of the categories of purchased drugs between the two groups

The most temporary drugs purchased by hospitals are immunomodulatory drugs and anti-infective drugs. Among the two groups of drug categories, the procurement of anti-infective drugs, nervous system drugs, respiratory system drugs and special/other therapeutic drugs has statistical significance. The conventional management group is significantly higher than the comprehensive thinking group (P<0.05). **Table 2**.

Table 2. Comparison of the categories of purchased drugs between the two groups [n(%)]

Group	Comprehensive thinking group (n=197)	General management group (n=197)	x^2	x^2
Digestive system and metabolism regulating drugs	9(4.57)	6(3.05)	0.624	0.430
Hematopoietic system drugs	7(3.55)	6(3.50)	0.080	0.778
Cardiovascular system drugs	5(2.54)	8(4.06)	0.716	0.397
Dermatological medications	4(2.03)	3(1.52)	0.145	0.703
Genitourinary system drugs	4(2.03)	6(3.05)	0.410	0.522
Hormone drugs	6(3.05)	9(4.57)	0.624	0.430
Anti-infective drugs	16(8.12)	31(15.74)	5.436	0.020
Immunomodulatory drugs	26(13.20)	29(14.72)	0.190	0.663
Musculoskeletal System Drugs	8(4.06)	7(3.55)	0.069	0.792
Nervous system drugs	1(0.51)	11(5.58)	8.595	0.003
Respiratory drugs	3(1.52)	16(8.12)	9.345	0.002
Sensory organ drugs	5(2.54)	4(2.03)	0.114	0.736
Special/other therapeutic drugs	3(1.52)	17(8.63)	10.324	0.001

3. Discussion

The results of this study show that the introduction of comprehensive drug clinical evaluation thinking can significantly optimize the efficiency of temporary drug procurement management in hospitals. The comprehensive thinking group's temporary procurement application rate dropped by 20.43%, the review failure rate dropped by 65.8%, and the execution rate increased by 18.53%, suggesting that this model effectively reduces unnecessary procurement through a systematic evaluation mechanism and improves decision-making accuracy and execution efficiency. This result is closely related to the significant decline in the purchase volume of anti-infective drugs, nervous system drugs and other categories. Taking anti-infective drugs as an example, its high purchase demand is directly related to the epidemiological characteristics of infectious diseases: increased bacterial resistance, rising risks of nosocomial infections and frequent new infectious diseases have all prompted clinical departments to tend to obtain broad-spectrum or new antibacterial drugs through temporary procurement [5]. In the traditional management model, due to vague review standards, temporary purchase applications for some unnecessary broad-spectrum antibiotics are easily approved, which may lead to drug abuse and exacerbate the risk of drug resistance [6]. By strengthening safety and necessity assessment, the comprehensive thinking model can effectively screen out the need for non-indications, thereby reducing the proportion of anti-infective drug procurement.

The conventional management model adopted by the control group is easy to operate and quick to respond, but its limitations are also very significant. First, the review process relies too much on historical procurement frequency and

clinical experience, lacks a standardized evaluation system, and is difficult to respond to the individual needs of complex cases. For example, the high procurement rate of immunomodulatory drugs in the routine management group may reflect the urgent need for new targeted drugs in some departments, but the patient's genetic test results or drug indication matching are not fully considered, resulting in the failure of some purchased drugs to effectively translate into clinical benefits. In addition, although the step-by-step approval process can avoid some risks, due to the lack of multi-dimensional evaluation basis, the review process tends to become a formality, which ultimately manifests itself in a high pre-review failure rate and temporary procurement application rate. From the perspective of management mechanism, the limitations of the traditional model stem from its "passive response" characteristics. Temporary procurement needs are mostly initiated directly by clinical departments. The pharmacy department can only make preliminary judgments based on limited past data, making it difficult to comprehensively assess the long-term cost-effectiveness or potential risks of drugs [7-8]. In addition, the traditional model lacks an after-the-fact tracking mechanism and cannot optimize follow-up decisions through medication feedback, forming a closed-loop defect of "emphasis on approval and neglect of management".

The design principle of the comprehensive evaluation management model implemented by the observation group is derived from a systematic analysis of the pain points of temporary procurement. This model achieves management upgrades through innovation in three aspects: First, it pays equal attention to demand orientation and risk control: by forming a cross-department management team and integrating the professional perspectives of the pharmacy department and clinical departments, it ensures that procurement decisions not only meet actual clinical needs but also avoid medication risks. For example, in the procurement of immunomodulatory drugs, the management team can combine patient pathological classification, drug-based evidence, and medical insurance payment policies to select drugs with clear indications and precise efficacy to avoid decision-making biases caused by information asymmetry; second, closed-loop process and dynamic optimization: This model forms a closed-loop management loop through pre-examination and follow-up tracking mechanisms. In the pre-review stage, applications are strictly screened from dimensions such as necessity, safety, and economy, while follow-up continues to optimize the drug catalog through clinical feedback and data analysis. For example, regular analysis of respiratory drug procurement data can help hospitals identify conventional drugs with stable efficacy and high cost performance, reducing reliance on temporary procurement; third, professional division of labor and implementation of responsibilities: the first review responsibility system and the fixed pharmacist full-process tracking mechanism not only improve the professionalism of the review, but also strengthen the attribution of responsibilities. The same drug is reviewed by a fixed pharmacist, which can avoid fluctuations in evaluation standards caused by personnel replacement. At the same time, long-term data accumulation can provide a reliable basis for dynamic adjustments to the drug catalog [9~10]. Taking respiratory drugs as an example, the treatment of acute exacerbations of chronic obstructive pulmonary disease requires adjusting the medication regimen based on patient blood gas analysis and inflammatory indicators. The comprehensive evaluation model can provide evidence-based basis for subsequent purchases by tracking drug efficacy and adverse reaction data and reduce the randomness of empirical medication [11].

From the perspective of disease pathological mechanisms, the application of comprehensive evaluation models has significantly improved the suitability of drugs and clinical scenarios. Taking special/other therapeutic drugs as an example, the procurement of certain rare disease drugs needs to be based on the patient's genetic test results and disease progression stage. The traditional model can easily lead to drug misuse or waste due to the lack of molecular diagnostic support[12]. By incorporating disease-specific biomarker analysis, the comprehensive evaluation model can accurately identify applicable groups and ensure that limited resources are directed to patients who need it most.

The results of this study confirm that an integrated mindset can significantly reduce the rate of unnecessary purchases and improve execution efficiency. This achievement is essentially due to its targeted improvement of traditional management shortcomings: at the decision-making level, the multi-dimensional evaluation system makes up for the shortcomings of empirical decision-making, making procurement more in line with the actual needs of disease treatment; at the execution level, process optimization and clear responsibilities reduce redundancy in the approval process and speed up procurement response; at the resource level, dynamic catalog management avoids the ineffective accumulation of drug

inventory and improves the overall utilization efficiency of medical resources.

This study also has certain limitations: first, as a single-center retrospective study, the extrapolation of the results needs to be further verified through multi-center prospective studies; secondly, the implementation of the comprehensive evaluation model depends on the hospital's informatization level and multi-department collaboration capabilities, and institutions with insufficient resources may face implementation challenges; finally, this study did not analyze the weight differences of evaluation indicators in different disease categories in detail, and a dynamic weight allocation model needs to be established in the future to enhance decision-making flexibility.

In summary, the comprehensive drug clinical evaluation thinking provides a scientific and standardized solution for hospital temporary procurement management by integrating multi-dimensional data, strengthening process closed-loop and focusing on clinical value.

About the author

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Disclosure statement

The author declares no conflict of interest.

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