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# Research on the Financial Impact of Centralized Procurement of Medical Consumables on Public Hospitals

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## Abstract

With the continuous deepening of the reform of China's medical and health system, the centralized procurement with volume-based policy has gradually expanded from pharmaceuticals to medical consumables, becoming an important means to control medical expenses and alleviate the burden on patients. While the centralized procurement model significantly reduces the prices of consumables, it also profoundly impacts the financial management systems of public hospitals. Based on policy evolution and hospital management practices, this paper systematically analyzes, from a financial perspective, the effects of the centralized procurement model on tertiary public hospitals in terms of cost structure, capital operations, budget management, and internal control, identifies existing financial risks and operational challenges, and proposes corresponding response strategies and optimization paths. The study finds that while centralized procurement reduces the proportion of medical consumables and optimizes long-term cash flow, it also imposes higher requirements on hospitals' short-term capital turnover, revenue structure, supply chain coordination, and financial internal controls. In the future, public hospitals need to further promote the integration of business and finance, strengthen information technology support, and improve performance incentives to achieve high-quality development amid policy changes.

## Keywords

Medical Consumables, Centralized Procurement Model, Financial Management, Cost Control

## 1. Introduction

Medical consumables, as an important material foundation of healthcare services,

have seen their costs continuously rise as a proportion of total medical expenditures in tertiary public hospitals. This is particularly evident in the context of the removal of consumable markups and the promotion of reforms in medical insurance payment methods, such as Diagnosis-Related Groups / Diagnosis-Intervention Packet, where hospital operational models are shifting from markups on medical drugs and consumables to markups on technical services. Since the pilot centralized procurement of coronary stents in 2020, the national organization of high-value medical consumables has gradually expanded to areas such as artificial joints, orthopedic trauma, and dental implants, forming a trend of regularized and institutionalized advancement. Centralized procurement significantly reduces purchase prices through volume-based pricing and the integration of bidding and procurement, while also reshaping the internal financial management logic of hospitals. Against this backdrop, exploring the impact mechanisms of centralized procurement on the finances of public hospitals holds important theoretical and practical significance for improving hospital economic operation efficiency and adapting to healthcare reform policies.

## 2. Background and Related Research on Centralized Procurement of Medical Consumables

### 2.1. Social and Policy Background of Centralized Procurement of Medical Consumables

China's medical consumables market is vast and diverse, with longstanding issues such as excessively high prices, multiple distribution layers, and heavy financial burdens on patients. In 2019, the General Office of the State Council issued the "Reform Plan for Governing High-Value Medical Consumables," marking the entry of centralized procurement of high-value consumables into the national implementation stage. Starting in 2020, the National Healthcare Security Administration organized centralized procurement of coronary stents, artificial joints, and other items, with average price reductions exceeding 80%. Local alliance procurement has gradually expanded to cover products such as balloons, films, and staplers. The centralized procurement policy aims to use a price discovery mechanism to reduce excessive premiums in the distribution process, promote a return to reasonable consumable prices, and simultaneously coordinate with healthcare payment reforms and hospital performance evaluations, thereby building a reform coordination and integrated governance system across the medical, healthcare, and pharmaceutical sectors.

### 2.2. Research on Centralized Procurement of Medical Consumables at Home and Abroad

Domestic research has primarily focused on the design and implementation effects of centralized procurement policies. Yin et al. (2017) provided international experience for China through a comparative analysis of the pricing and reimbursement mechanisms for medical consumables in Japan and Australia. The study pointed out that Japan sets uniform medical insurance payment prices cen-

trally and uses refined "functional classification" pricing, while also introducing a "foreign reference price system" for dynamic adjustment. In contrast, Australia applies the Australian Refined Diagnosis-Related Groups within the public hospital system and conducts price negotiations through a "prostheses List" in the private system. The study suggests that China should optimize bundled payments, leverage evidence-based and economic evaluations, and establish a price monitoring system. Xin and Gong (2021), using the centralized procurement of Intraocular Lens in Shanghai as an example, pointed out that while centralized procurement lowers prices, it also faces challenges such as clinical adaptability, supply assurance, and public opinion guidance. Zheng (2022) further analyzed the impact of centralized procurement on hospital budgets, inventory management, and supervision from a financial management perspective, emphasizing the importance of integrating business and finance functions and leveraging information technology support. Zhang et al. (2022) noted that while centralized procurement has achieved significant price reductions for drugs and consumables, there are still issues such as repeated procurement by provinces and alliances, inconsistent quality evaluation standards for consumables, and low domestic production rates for certain high-value consumables. They emphasized the need to establish bid procurement rules and quality evaluation systems tailored to each product. Sun and Xu (2023), from the perspective of hospital management operations, systematically analyzed the problem of an excessively high proportion of hospital consumables and proposed comprehensive strategies including strict control of consumable entry, quantification of management indicators, reinforcement of budget management, and the introduction and optimization of SPD supply chain management systems, aiming at refined consumable management and cost control. Hu et al. (2023), from a total life cycle cost perspective, proposed that public hospitals should implement refined control measures at each stage of procurement, inventory, usage, and supervision. Feng and Chen (2025) focused on the direct impact of centralized procurement on hospital financial management, indicating that while it reduces procurement costs and refines budget management, it also brings financial risks such as changes in income structure, short-term cash flow pressure, and weakened supplier services. They proposed addressing these challenges through strengthened financial internal controls, the promotion of business-finance integration, and the introduction of the SPD model.

Foreign studies indicate that centralized procurement is generally effective in controlling healthcare costs. For instance, Japan has established a distinctive hybrid model in medical consumables procurement management, combining government-led centralized procurement with voluntary hospital purchases to form a multi-tiered, differentiated procurement system. The Ministry of Health, Labour and Welfare in Japan formulates a nationwide unified medical fee schedule through the Central Social Insurance Medical Council, which includes payment standards for medical consumables under health insurance. For basic consumables that are high-volume and standardized, Japan implements centralized pro-

curement and price regulation. In 2015, Japan introduced a medical device price benchmark system, setting government guidance prices for approximately 5000 medical devices, with procurement prices by medical institutions not exceeding 1.3 times the benchmark price. Additionally, Japan employs a refined group-based pricing strategy for consumables, categorizing products into different levels based on technical characteristics, clinical effectiveness, production cost, and other factors, and implementing differentiated payments. Examples such as the U.S. Group Purchasing Organization (GPO) model and the European joint procurement mechanism also reduce expenditures through large-scale and standardized procurement, though their success depends on strong contract compliance, quality evaluation systems, and internal hospital management coordination.

## 3. Financial Impact of the Current Centralized Procurement Model for Medical Consumables

### 3.1. Current Status of the Centralized Procurement Model for Medical Consumables

As of 2024, at the national level, four batches of centralized procurement for high-value medical consumables have been carried out, covering high-value items in cardiology interventions, orthopedics, dentistry, and other areas, with an average reduction exceeding 80%. Inter-provincial alliance procurement is also continuously expanding its scope, forming a dual-layer procurement system consisting of national organizations and local alliances. Through rules such as "one item, one policy" classification bidding, stepwise price reduction, and comprehensive evaluation, centralized procurement has significantly lowered prices. At the same time, supporting policies such as coordinated medical insurance payments and retention of surplus funds encourage medical institutions to use selected products.

### 3.2. Changes in Hospital Internal Management under the Centralized Procurement Model

Centralized procurement drives hospitals to shift from passive purchasing to proactive cost management. Hospitals need to establish a consumables management committee, strengthen access verification and supplier evaluation, and especially consider actual feedback from doctors and patients using medical consumables as the main evaluation basis. Hospitals should implement secondary warehouse management and a consumption-based sales model to replace the previous rudimentary "issue-then-sell" approach. Utilizing the SPD (Supply-Processing-Distribution) supply chain model can achieve zero-inventory management and enhance turnover efficiency. Internal performance assessments also incorporate consumable cost control into departmental and individual evaluations, promoting rational clinical usage.

### 3.3. Direct Financial Impact of the Centralized Procurement Model

1) Full-process dynamic control of budget management. Centralized procure-

ment contracts lock in the prices and basic purchase quantities of major consumables, transforming hospital budget preparation from loosely controlled totals—previously disconnected from clinical demand—to a process based on historical consumption data, with dynamic monitoring and early warning during execution in line with contract quantities and prices. Budgets for annual consumable expenditure can thus be prepared with greatly improved accuracy, based on winning bid prices, agreed purchase quantities, and historical non-procurement usage data. During budget execution, dynamic monitoring and warnings can be applied according to the actual usage progress of procurement products. For example, interventions can be made for departments with abnormal usage growth, or products at risk of not meeting the agreed purchase quantities can be analyzed to ensure strict budget adherence and effective implementation of centralized procurement policies.

2) Changes in performance allocation. With the elimination of markup on consumables, income derived from consumables decreases, pushing the revenue structure toward services that reflect the value of technical labor, such as examinations, surgeries, and nursing. Under the dual policy-making orientation of centralized procurement and medical insurance payment reform (DRG/DIP), departmental revenue contributions to performance have changed. Departments with significant use of high-value consumables, such as cardiology and orthopedics, may see their performance-related revenue decline, while departments relying on technical services may see relative increases, reflecting the higher proportion of performance attributed to technical labor.

3) The impact of the coexistence of centralized procurement and regular procurement on financial management. Against the backdrop of the comprehensive implementation of centralized procurement of medical consumables, the procurement system in public hospitals has not completely shifted to a single model, but has generally formed a dual-track system of centralized and regular procurement. After significant changes in the proportions of medical consumables under the two procurement modes following the initial implementation of the centralized procurement policy, the trend has gradually stabilized and changed incrementally. At present, the proportion of centrally procured to regularly procured medical consumables is roughly 1:2. This coexistence stems from the complexity of clinical demand: centralized procurement mainly covers mature products that are highly standardized and have high usage, while many specialty-specific, innovative, or urgent rescue consumables still need to be procured through traditional channels. Centrally procured consumables typically involve financial processes such as medical insurance advance payments and special settlement funds, whereas regular procurement follows the traditional accounts payable process. This hybrid model imposes refined and complex demands on hospital financial management. Under policy requirements, centralized consumables usually necessitate procurement in large quantities, so cost control focuses on ensuring the completion of the agreed procurement volume to avoid the risk of contract breach or price adjust-

ments due to insufficient usage. In contrast, the core of controlling regular procurement lies in strictly managing purchase prices and quantities through internal hospital negotiations, supplier competition, and assessments of usage necessity, to strictly control expenditure growth within the scope covered by the hospital's total revenue growth and adjustments in medical service prices. This requires close coordination between the finance department and the materials management department to develop differentiated approval workflows, payment strategies, and performance evaluation indicators.

## 4. The Impact of the Centralized Procurement Model for Medical Consumables on Financial Structure

### 4.1. Reduction in Consumables Proportion and Adjustment of Revenue Structure

After the implementation of the centralized procurement policy, the proportion of medical consumables revenue in total hospital revenue has significantly decreased. According to statistics from the National Health Commission, between 2021 and 2023, the proportion of medical consumables revenue in total revenue of public hospitals fell from 18.5% to 12.3%, a cumulative decline of 6.2% over three years. During the same period, the revenue proportion reflecting the labor value of medical staff, such as fees for surgeries, treatments, and nursing, increased from 35.8% to 41.2%, showing a shift in the revenue structure toward technology-intensive services.

According to the 2021 "Pilot Program for Deepening Medical Service Price Reform" issued by the National Healthcare Security Administration and seven other departments, the core goal of price adjustments is to optimize the hospital revenue structure. The significant savings to medical insurance funds and patient burdens generated by centralized procurement provide room to improve the pricing of medical services that reflect the technical labor value of healthcare staff, including diagnosis and treatment, surgery, nursing, and traditional Chinese medicine services. For example, after many regions simultaneously removed the markup on medical consumables, the prices of services such as surgery, consultation, and rehabilitation treatment were generally increased, with surgery fees rising 30% - 50% in particular.

From a long-term transformation perspective, the direction clearly forces hospitals to adjust their revenue structure, shifting from total volume expansion to high-quality and efficient operations, and from reliance on material consumption to dependence on technology and service innovation. Departments such as financial management need to reassess the profitability of each department and optimize resource allocation strategies. Hospitals gradually reduce their dependence on consumables revenue and promote a shift in revenue structure toward technology-intensive services, aligning with the high-quality development goals of public hospitals.

### 4.2. Short-Term Cash Flow Pressure and Long-Term Capital Structure Optimization

1) Short-term financial pressure emerges. With medical service price adjustments not yet fully implemented, hospitals generally face income gaps. After sampling tertiary hospitals in the eastern region, an estimation based on the historical data differential comparison method indicates that under the dual impact of eliminating consumable markups and price reductions from centralized procurement, annual hospital revenue decreases by approximately 8%, while the adjustment of technical service prices during the same period only compensates for about 60% of the gap. Centralized procurement contracts usually stipulate payment within 30 days, significantly shortening the previous 90 - 180-day payment cycle. Although prepayment of 30% - 50% of the funds by the medical insurance fund provides a buffer and helps alleviate hospitals' cash pressure, hospitals still need to quickly raise substantial funds to pay the remaining amounts. The sharp drop in selected product prices may also lead to short-term concentrated payments and poor turnover during supply chain coordination and inventory model transformation.

2) Long-term capital structure optimization. Historically, hospital cash flow fluctuations were closely tied to high-value consumable purchases and medical insurance reimbursement cycles, showing significant pressure on cash flow for medical drugs and consumables. Technical service income, however, is characterized by high stability, strong predictability, and low bad debt risk. Unlike the past when consumable income depended on supplier payment cycles and medical insurance reimbursement progress, the adjusted medical service income, as the hospital's core output, has smoother settlement and cash flow. This significantly improves the quality and sustainability of hospitals' operational cash flow. According to the "2022 Statistical Bulletin on the Development of China's Health and Medical Services" and referring to the "China Hospital Operation Management Report 2023" released by the China Hospital Association, in regions where price adjustments have been implemented, pilot hospitals, although experiencing a decrease in the proportion of revenue from consumables, have seen an average increase of 8% - 12% in the proportion of income from medical technology services. This has enhanced overall revenue stability and laid a solid foundation for long-term cash flow sufficiency. With medical price reform centered on technical services, recurring cash inflows based on technical service income significantly reduce the risk of cash chain disruption, providing more stable funding for responding to public health emergencies or long-term investments. Direct procurement cost savings from centralized procurement and net income growth from price adjustments collectively boost the hospital's net profit. This portion of funds no longer needs to be passively paid in bulk to consumable suppliers but is autonomously managed by the hospital within the budget framework. Hospitals can allocate more resources to talent recruitment, discipline development, research and innovation, and IT upgrades—areas conducive to long-term development—thus driving the

shift from a resource-consuming model to an intrinsic development model and achieving a higher-level capital cycle.

### 4.3. Transformation of Cost Management towards Refinement and Full-Process Control

1) Refinement of cost accounting. Traditional cost accounting is department-based. After centralized procurement, as hospitals generally implement both centralized and ordinary procurement systems, there is an urgent need to establish a cost accounting system that goes from department-level to disease-level based on DRG/DIP, allowing accurate analysis of the consumable cost composition for each disease. Additionally, hospitals need to fully adopt real-use, real-sale methods to replace the previous requisition-based model. Hospital financial information systems must be integrated with medical information systems to establish and improve secondary inventory management systems, enabling real-time tracking of consumables from warehousing to patient use. The timing of cost recognition shifts from the requisition stage to the actual usage stage, improving cost accounting accuracy.

2) Full-process control of cost accounting. Centralized procurement drives hospitals to shift from post-event cost accounting to predictive forecasting and mid-event control. By establishing a full life cycle cost control system, hospitals embed financial control nodes at each stage, including budget preparation, procurement justification, usage traceability, and performance evaluation, achieving costs that can be knowable, controllable and optimizable. Beginning with procurement justification and value assessment, hospitals establish a Consumable Management Committee to evaluate new consumables on both technical and economic grounds, controlling costs from the source. During operations, linking HRP and HIS systems ensures synchronization between consumable use and billing, preventing errors or omissions in specific billing details. Ultimately, centralized procurement promotes the optimization of clinical pathways, and standardizing clinical pathways and consumable use encourages hospitals to develop standardized consumable usage plans, reducing unreasonable usage.

## 5. Risks and Responses in Financial Management under Centralized Procurement of Medical Consumables

### 5.1. Major Risks in Financial Management

1) Clinical Adaptation Risk. The acceptance of selected products by doctors and patients affects clinical use. If a substitute product appears with inappropriate indications, it may trigger medical risks or disputes. A significant price drop may affect product quality stability and could also lead to quality risks.

2) Supply Chain Risk. Products with sharply compressed profits may have unstable quality in supplying medical consumables. The willingness of companies to supply and deliver may decrease, potentially leading to shortages or reduced services.

3) Financial Internal Control Risk. First, with the large variety of centralized procurement items and dynamic price changes, frequent price adjustments make traditional financial accounting methods difficult to adapt to, easily leading to issues such as discrepancies between accounts and actual, and inaccurate cost allocation. Second, the usage, procurement volume, and earmarked fund requirements of centralized procurement consumables differ significantly from the flexible negotiation and emergency procurement processes of regular purchases. If internal control processes are not timely reconstructed, there is a high risk of a disconnect between business management and financial management. If the two processes are confused or lack clear identification in the application, approval, warehousing, and delivery stages, the finance department will struggle to accurately collect costs and control budgets, leading to normal purchases encroaching on the centralized procurement budget and cash flow, or failure to complete centralized procurement tasks, resulting in risk of breach of contract.

4) Policy Coordination Risk. If centralized procurement is not well-coordinated with DRG/DIP payment reforms, medical service price adjustments, and other policies, hospital staff income compensation may be inadequate. Additionally, inconsistent assessment requirements across policies expose hospitals to multiple assessment pressures, increasing operational complexity and management costs.

### 5.2. Paths for Optimizing Financial Management and Future Trends

1) Strengthen the integration of business and finance and the development of information systems. For consumables procured centrally, the finance department should collaborate with the medical quality control department to be involved in the selection, contract management, and usage analysis of consumables in advance, reinforce the supervision of warehouse acceptance, and use systems such as ERP and SPD to achieve shared clinical usage monitoring data and process control.

2) Improve supply chain coordination mechanisms. Hospitals need to establish a supplier evaluation and backup list, create backup products for regular procurement and emergency procurement mechanisms, implement SPD inventory management and logistics models, and ensure clinical supply and delivery efficiency.

3) Build financial internal controls suited to centralized procurement models. Based on organizational and institutional foundations, establish the Medical Consumables Management Committee as a decision-making body. Committee members should have substantive approval and supervision authority. Set up specialized positions familiar with centralized procurement policies in the finance and medical equipment departments to track contract performance, handle data reporting, and coordinate medical insurance settlements, ensuring precise implementation of centralized procurement policies at the hospital end. Revise internal control systems to establish two sets of internal control workflows, from procurement, warehousing, usage, payment, and inventory systems, clearly defining dif-

ferentiated processing rules for centralized and non-centralized procurement items. Build an integrated intelligent management platform to achieve full-link data matching and interoperability from budgeting, procurement, inventory, consumption, billing, to cost accounting.

4) Establish a dynamic policy tracking and evaluation decision-making mechanism. On the basis of the Medical Consumables Management Committee, continuously monitor national and local policies on centralized procurement, pricing, and medical insurance payments. Evaluation content includes: the impact of new product access and old product withdrawal on clinical pathways, the effect of price changes on department cost structures, and financial simulation of cash flow pressure during the policy window period in advance. Use big data to analyze the relationship between consumable use, disease types, and surgical procedures, supporting clinical pathway optimization and cost control decisions. Performance assessment of medical staff requires more precise and flexible evaluation plans, with exemption and adjustment mechanisms included in the assessment.

## 6. Conclusion and Outlook

Centralized volume-based procurement, as a key measure to deepen healthcare reform, has effectively reduced the prices of medical consumables and eased patient burdens, while profoundly reshaping the financial management logic of public hospitals. In the short term, hospitals face multiple challenges such as adjustments in revenue structure, cash flow management, and supply chain coordination; in the long term, centralized procurement drives hospitals to transform towards refined and intensive operations, promoting the integration of business and finance and enhancing cost-control capabilities.

In the future, as the scope of centralized procurement expands, rules improve, and reforms in medical insurance payment methods advance, public hospitals will need to further strengthen internal management capabilities, use information technology to redesign financial processes, build modern hospital financial management systems that adapt to policy changes and economic operations, and ultimately achieve coordinated development in medical quality, operational efficiency, and financial sustainability.

## Conflicts of Interest

The author declar s e no conflicts of interest regarding the publication of this paper.

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