

A Study on the Impact of Performance Management in Integrated Cerebrovascular Disease Wards of Municipal Hospitals on the Quality of Stroke Treatment

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Abstract: *Objective:* To explore the impact of implementing a performance management model for cerebrovascular disease wards in municipal hospitals on the quality of treatment for patients with acute ischemic stroke, and to provide a reference for optimizing the management system of primary stroke centers. *Methods:* Eighty patients with acute ischemic stroke admitted to a municipal tertiary general hospital from July 2024 to July 2025 were selected as the study subjects. They were divided into a control group and an observation group, with 40 patients in each group, according to the implementation of the performance management model. The control group adopted the conventional management model of traditional cerebrovascular disease wards, while the observation group implemented a targeted performance management program for cerebrovascular disease wards. The differences in key treatment indicators and clinical prognosis between the two groups were compared. *Results:* The time from entry to needle (DNT) and time from entry to puncture (DPT) in the observation group were (38.26 ± 6.12) min and (68.41 ± 10.25) min, respectively, which were significantly shorter than those in the control group (56.14 ± 8.37) min and (92.73 ± 13.68) min, respectively ($P < 0.05$). The 7-day neurological function improvement rate in the observation group was 82.50%, and the 90-day good prognosis rate was 77.50%, both significantly higher than those in the control group (62.50% and 52.50%, respectively) ($P < 0.05$). The incidence of in-hospital adverse events in the observation group was 5.00%, significantly lower than that in the control group (20.00%) ($P < 0.05$). *Conclusion:* Implementing targeted performance management in the cerebrovascular disease wards of municipal hospitals can effectively shorten the critical time window for the treatment of acute stroke patients, improve the quality of treatment, and improve the clinical prognosis of patients. It is worth promoting and applying in primary stroke centers.

Keywords: Municipal hospitals; Cerebrovascular disease fusion ward; Performance management; Stroke treatment quality; Acute ischemic stroke

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1. Introduction

Stroke is the leading cause of death and disability among adults in China, characterized by high incidence, high mortality, high disability rate, and high recurrence rate, imposing a heavy disease burden on society and families. Municipal hospitals, as the backbone of China's stroke prevention and treatment system, bear the responsibility for treating the majority of acute stroke patients within their respective regions. In recent years, with the advancement of stroke center construction, many municipal hospitals have successively implemented the integrated cerebrovascular disease ward model, which integrates resources from multiple disciplines such as neurology, neurosurgery, interventional radiology, and rehabilitation medicine to establish a one-stop stroke treatment unit, breaking down traditional barriers between disciplines and achieving full-process management of stroke patients from emergency screening to post-operative rehabilitation ^[1]. Based on this, this study selected 80 patients with acute ischemic stroke from a municipal tertiary general hospital as research subjects to explore the impact of integrated ward performance management on the quality of stroke treatment, aiming to provide practical reference for the construction of stroke centers in municipal hospitals.

2. Materials and methods

2.1. General information

Eighty patients with acute ischemic stroke admitted to a municipal tertiary general hospital from July 2024 to July 2025 were selected as the study subjects. They were divided into two groups according to the implementation of the performance management model. The 40 patients who implemented traditional management from July 2024 to December 2024 were included in the control group, and the 40 patients who implemented performance management in the integrated ward from January 2025 to July 2025 were included in the observation group.

Inclusion criteria: (1) Meeting the diagnostic criteria for acute ischemic stroke as outlined in the "Chinese Guidelines for the Diagnosis and Treatment of Acute Ischemic Stroke 2023," confirmed by head CT or MRI; (2) The time from onset to admission was within a 4.5-hour time window, meeting the indications for intravenous thrombolysis or endovascular treatment; (3) Informed consent was obtained from the patient or their family; (4) Complete clinical data.

Exclusion criteria: (1) Severe failure of vital organs such as the heart, liver, and kidneys; (2) Intracranial hemorrhage or neoplastic diseases; (3) Mental illness preventing cooperation with the study ^[2]. There were no statistically significant differences in general characteristics between the two groups ($P > 0.05$).

2.2. Methods

The control group adopted the conventional management model of traditional cerebrovascular disease wards, namely, separate management by the neurology department, admission by the neurology department after emergency screening, and coordination of thrombolysis and interventional treatment by each department. Performance distribution was based on the traditional departmental plan, with workload as the main assessment indicator, and no specific assessment content was set for the stroke treatment process.

The observation group implemented a performance management plan for the cerebrovascular disease fusion ward, the details of which are as follows:

(1) Constructing an integrated ward organizational structure: Integrating personnel from multiple disciplines

such as neurology, neurosurgery, interventional radiology, emergency medicine, rehabilitation medicine, and radiology, and establishing a fixed integrated ward management team: the emergency department is responsible for pre-hospital handover and preliminary screening, the neurology department is responsible for intravenous thrombolysis and internal medicine management, the interventional radiology department is responsible for endovascular treatment, the neurosurgery department is responsible for patients requiring surgical intervention, the rehabilitation department provides early intervention and bedside rehabilitation, and the radiology department opens a green channel for stroke examination. All personnel are included in the unified management of the integrated ward.

- (2) Develop a targeted performance indicator system: Set up tiered performance assessment indicators around the core process of stroke treatment. The assessment content is divided into three dimensions: key time indicators, treatment quality indicators, and prognostic indicators. Key time indicators account for 40%, including the time from entry to needle (DNT), the time from entry to puncture (DPT), and the time for issuing imaging reports. The achievement rate of $DNT < 60 \text{ min}$ and $DNT < 45 \text{ min}$ is set as the core assessment point. For every minute exceeding the target, the corresponding performance will be deducted. An additional reward will be given if the achievement rate exceeds 90%. Treatment quality indicators account for 30%, including the rate of intravenous thrombolysis, the rate of endovascular treatment, the rate of guideline compliance, and the incidence of adverse events. Prognostic indicators account for 20%, including the rate of improvement in neurological function at 7 days and the rate of good prognosis at 90 days.
- (3) Establish a performance-based distribution and incentive mechanism: Change the traditional distribution model based on professional title, implement salary based on position and performance, and give preference to front-line treatment positions and key technical positions. Provide special subsidies to medical staff involved in stroke emergency treatment, and provide additional performance bonuses for night and holiday outpatient visits^[3]; link performance appraisal results with professional title promotion and commendation, and give priority to recommending those with excellent performance for promotion; set up a collaboration bonus to address communication problems in multidisciplinary collaboration, and give additional rewards to cross-departmental staff who actively cooperate and efficiently complete treatment, thereby improving the enthusiasm for multidisciplinary collaboration.

2.3. Observation indicators

- (1) Key time indicators for treatment: compare the DNT, DPT and DNT achievement rate of the two groups of patients ($DNT < 60 \text{ min}$ is considered to be achieved).
- (2) Clinical treatment effect: The National Institutes of Health Stroke Scale (NIHSS) was used to assess the neurological function of patients at admission and 7 days after onset. The improvement rate of neurological function was calculated: the improvement rate was defined as a decrease of ≥ 4 points in NIHSS score, and the improvement rate was calculated as the number of improved cases / the total number of cases $\times 100\%$. The modified Rankin Scale (mRS) was used to assess the prognosis of patients 90 days after onset. The good prognosis was defined as an mRS score ≤ 2 points. The good prognosis rate was calculated. The incidence of adverse events in the hospital was statistically analyzed for both groups of patients.

2.4. Statistical methods

SPSS 28.0 statistical software was used. Quantitative data were expressed as ($\bar{x} \pm s$), and independent samples t-tests were used for comparisons between groups. Categorical data were expressed as cases (%), and chi-square tests were used for comparisons between groups. $P < 0.05$ was considered statistically significant.

3. Result

3.1. Comparison of key time indicators in the treatment of the two groups of patients

The DNT and DPT of the observation group were significantly shorter than those of the control group, and the DNT target achievement rate was significantly higher in the observation group than in the control group. The differences were statistically significant ($P < 0.05$), as detailed in **Table 1**.

Table 1. Comparison of key time indicators in the treatment of the two groups of patients

Group	Number of examples	DNT (mean $\pm$ SD, min)	DPT (mean $\pm$ SD, min)	DNT compliance rate [Example (%)]
Control group	40	56.14 $\pm$ 8.37	92.73 $\pm$ 13.68	28 (70.00)
Observation group	40	38.26 $\pm$ 6.12	68.41 $\pm$ 10.25	38 (95.00)
t/ χ^2 value		10.932	8.975	8.658
p-value		< 0.001	< 0.001	0.003

3.2. Comparison of clinical treatment effects between the two groups of patients

The 7-day neurological function improvement rate and the 90-day good prognosis rate of the observation group were significantly higher than those of the control group, and the incidence of in-hospital adverse events was significantly lower in the observation group than in the control group. All differences were statistically significant ($P < 0.05$), as detailed in **Table 2**.

Table 2. Comparison of clinical treatment outcomes between the two groups of patients [n(%)]

Group	Number of examples	7-day improvement in neurological function	Good prognosis at 90 days	Adverse events within the hospital
Control group	40	25 (62.50)	21 (52.50)	8 (20.00)
Observation group	40	33 (82.50)	31 (77.50)	2 (5.00)
χ^2 value		4.013	5.495	4.114
p-value		0.045	0.019	0.043

4. Discussion

4.1. Performance management in integrated wards can effectively shorten the critical time for stroke treatment

The treatment outcome of acute ischemic stroke is closely related to the treatment time. For every minute that thrombolysis is performed earlier after the onset of the disease, approximately 1.9 million neurons can be saved. Shortening critical times such as DNT and DPT is the core goal of improving the quality of stroke treatment.

The results of this study showed that the DNT and DPT of the observation group were (38.26 ± 6.12)

min and (68.41 ± 10.25) min, respectively, which were significantly shorter than those of the control group. The DNT target achievement rate reached 95.00%, which was significantly higher than 70.00% of the control group. The differences were statistically significant ($P < 0.05$). This indicates that the performance management of the integrated ward can effectively shorten the critical time for stroke treatment, which is consistent with the results of relevant domestic studies. The performance management takes key time indicators such as DNT and DPT as the core assessment content and directly links them to performance distribution, which fully mobilizes the enthusiasm of medical staff, minimizes the time of each link, and thus shortens the overall treatment time.

4.2. Integrated ward performance management can significantly improve the quality of stroke treatment and improve patient prognosis

The quality of stroke treatment is ultimately reflected in the patient's clinical prognosis. The ultimate goal of shortening the treatment time is to reduce mortality and disability rates and improve the patient's quality of life.

The results of this study showed that the neurological function improvement rate at 7 days was 82.50%, and the good prognosis rate at 90 days was 77.50%, both significantly higher than those in the control group. The incidence of in-hospital adverse events was 5.00%, significantly lower than that in the control group. All differences were statistically significant ($P < 0.05$). This indicates that performance management in the integrated ward can effectively improve the quality of stroke treatment and improve patients' clinical outcomes. Performance management in the integrated ward further improves the efficiency of multidisciplinary collaboration, and early intervention in bedside rehabilitation by the rehabilitation department helps promote the recovery of patients' neurological function and reduce the incidence of complications.

5. Conclusion

Implementing targeted performance management in the cerebrovascular disease wards of municipal hospitals can clarify the responsibilities of each position, fully mobilize the enthusiasm of medical staff, optimize the stroke treatment process, effectively shorten the critical time window for the treatment of acute ischemic stroke patients, improve the quality of treatment, improve the clinical prognosis of patients, and at the same time improve the job satisfaction of medical staff. It is suitable for promotion and application in stroke centers of primary municipal hospitals and has important practical significance for improving the construction of my country's stroke prevention and control system.

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Disclosure statement

The authors declare no conflict of interest.

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