

Impact of Diagnosis-Related Groups (DRG) Payment on the Quality And Efficiency of Peripheral Arterial Disease (PAD) Care : A Mixed-Methods Study

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BACKGROUND & OBJECTIVE

- Diagnosis-Related Groups (DRG) Payment is widely recognized for enhancing healthcare efficiency, though its impact on the quality of care remains mixed.
- China has scaled up a nationwide pilot of DRG payment since 2021, resulting in a continuous decrease in health expenditures. However, there are growing concerns about its potential adverse effects on the quality of care.
- The prevalence of peripheral arterial disease (PAD) is increasing globally. The significant heterogeneity among patients and the lack of standardized treatment lead to substantial variations in quality of care, which could be exacerbated in the context of DRG.
- This study aimed to investigate the impact of the DRG payment on the quality and efficiency of care for PAD patients in China.

METHODS

- Using a mixed-methods design, we analyzed quantitative data from a PAD cohort registry from 10 tertiary hospitals in China between 2021 and 2023, and qualitative data from interviews in DRG pilot hospitals.
- A two-way fixed effects difference-in-differences (DID) analysis evaluated the effect of DRG payment, assessing quality of care through six indicators (three immediate post-surgery and three within a 30-day period) and the efficiency using hospitalization expenditure and length of stay.
- Post-operative indicators included the absolute change and the probability of reduction in clinical severity, as quantified by Rutherford Category, alongside patient-reported symptom relief ranging from 0 to 10.
- For the 30-day metrics, we assessed the absolute improvement and the likelihood of enhancement in Health-related Quality of Life(HR-QoL), as well as the incidence of adverse events.
- Thematic analysis was conducted using a framework based on the hierarchy of top-down policy implementation.

RESULTS

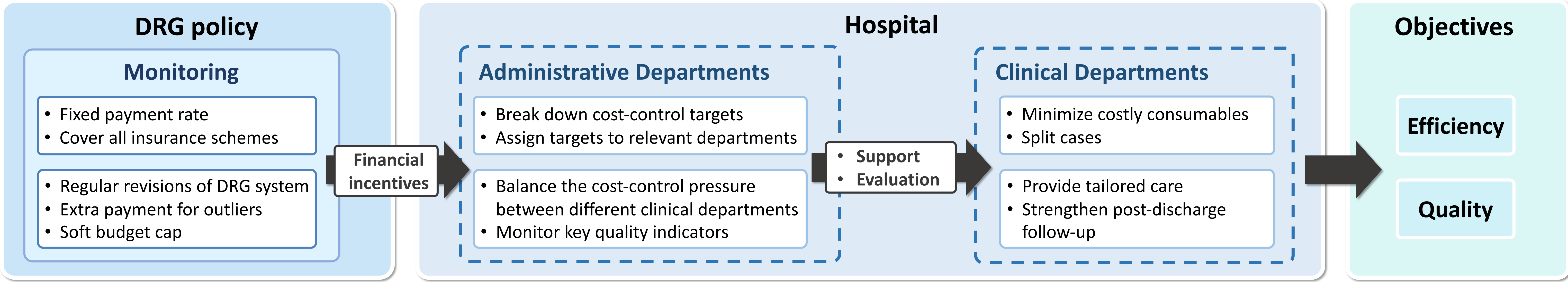
- DID results indicated that DRG lowered hospitalization expenses by 6% ($P<0.05$) and shortened lengths of stay by 1.6 days ($P<0.01$) without compromising six quality indicators. In addition, we checked the pre-policy trend, and all analyses satisfied the parallel trend assumption.
- To test the robustness, we combined propensity score matching (PSM) with DID. Despite smaller sample sizes leading to less significant estimates, the positive impact on efficiency remained consistent, though the previously significant quality improvement became insignificant.

Table 1 Impacts of the DRG payment on quality of care and efficiency

Variables	Reduction in clinical severity	Probability of clinical severity reduction	Patient-reported symptom relief	30-day HR-QoL improvement	Probability of 30-day HR-QoL improvement	30-Day Adverse Event Incidence	Ln(Expenditure)	Length of stay
Whole sample								
DRG payment	0.712 (0.469)	0.162 (0.117)	0.36 (0.313)	0.198** (0.071)	0.0222 (0.025)	0.0222 (0.034)	-0.0639** (0.024)	-1.613*** (0.435)
Observations	4,648	4,648	4,568	3,213	3,213	4,648	4,648	4,648
PSM								
DRG payment	0.719 (0.487)	0.15 (0.117)	0.308 (0.296)	0.0752 (0.084)	0.0032 (0.031)	0.0109 (0.029)	-0.0578* (0.025)	-1.581** (0.544)
Observations	3,088	3,088	3,029	2,097	2,097	3,088	3,088	3,088

Notes: Standard errors clustered at the hospital-year level are reported in parentheses. ***, **, and * denote the significance at the 1%, 5%, and 10% level, respectively.

- At the policy level, fixed-payment naturally incentivized efficiency improvements, while regular revisions of DRG systems, extra payment for cost-outliers, soft budget cap, and targeted monitoring were applied to address unintended consequences on quality.
- Within hospitals, administrative departments responded with enhanced financial management, training, and evaluation of DRG-related performance, effectively encouraging a focus on both efficiency and quality. Clinical departments, guided by these management measures, reconciled both aspects by minimizing costly consumables while adopting more tailored patient management.



CONCLUSION

- DRG significantly improved care efficiency without compromising short-term care quality for PAD. Further research should explore the long-term impacts on quality and identify effective strategies for incentivizing and monitoring provider behaviors.