

# Comprehensive Nursing Strategies to Reduce Hospital Stay for Total Knee Replacement Patients

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**Abstract:** For total knee replacement patients, how to reduce hospital stay on the premise of high quality therapeutic effect is a most critical issue. Less hospital stay is beneficial for not only decreasing unnecessary medical spending, but improving the therapies consequences as well. Thus, it is a key issue to alleviate the medical resources-strain problems and offer the patients more comfortable treatment conditions. In this work, researches of reducing hospital stay for total knee replacement patients over the last decade were investigated and comprehensive clinical nursing strategies were proposed. The proposed strategies are consisted of pre-operation education, physiotherapeutics during the surgery, multimodal pain management and discharge preparation. Advanced academic researches and clinical nursing experiences were summarized and comprehensive clinical nursing strategies for total knee replacement patients were demonstrated for reference.

**Keywords:** Nursing; Total Knee Replacement; Reduce Hospital Stay; Nursing Strategies

## Introduction

Total knee arthroplasty is a common surgical operation in orthopaedic medical treatment in major hospitals at present. The operation can effectively remove the late knee joint pain common to the elderly and greatly improve the quality of life of knee joint patients. With the improvement of people's living standards and the aggravation of social aging, the number of people suffering from knee joint diseases is increasing. Total knee arthroplasty has become a common treatment method.

A large number of total knee arthroplasty operations not only further aggravate the strain on medical resources, but also bring great inconvenience to patients themselves and their families. Especially for China, medical resources are extremely scarce, and high-quality medical conditions are difficult to meet the growing medical market. High-quality total knee replacement surgery not only needs to complete the examination process and the operation process, but also has the professional nursing before and after the operation. Compared with such a large group of knee joint patients, these processes are greatly consumed, which caused extremely limited medical resources and even the difficulty of seeing a large number of patients. Shortening hospital stay has become a problem that must be faced in total knee arthroplasty.

To reduce the hospitalization time of patients with total knee arthroplasty, nursing workers and researchers at home and abroad have done a great deal of academic and clinical research practice. This article has collected and sorted out the relevant SCI and search papers published in the past 10 years. On the basis of research, articles with high relevance and credibility are selected, and articles and data without peer review are excluded enough complete and sound articles, and 34 and SCI papers that meet the requirements were obtained. It was concluded that preoperative education for patients, physical therapy for the day of surgery, multimodal pain control and pre-discharge preparation were the most frequently mentioned nursing methods. According to the four kinds of nursing methods mentioned in the literature, this

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doi: 10.18686/jn.v9i1.162

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paper analyzes and discusses them, and obtains a comprehensive nursing strategy aimed at reducing the hospitalization time of patients undergoing total knee arthroplasty, which provides a reference for the nursing scheme of total knee arthroplasty.

## 1. Preoperative education for patients

The conclusion of the 20 articles indicate that conditions and shortening hospital stay are of great help<sup>[1][8-26]</sup>. Among them, the 4 and the article give the statistically significant impact of the data from the level of clinical actual data,<sup>[8][15][20][26]</sup>. Jones and his partners suggested that for total knee arthroplasty, rich preoperative education is an effective way to shorten the hospitalization time of patients. In their verification experiment, the hospitalization time of patients who did not receive preoperative education was prolonged by 1.6 and times compared with patients who received rich and formal preoperative education. Similarly, in the clinical experiments of 60 and others, the experimental results show that receiving complete preoperative education can shorten hospitalization time, reduce drug expenditure and even improve the quality of functional recovery<sup>[15]</sup>.

McDonald pointed out in his research that if patients knew the basic contents and recovery process of total knee arthroplasty before surgery, they would behave more calmly during surgery and treatment. Preoperative education made them less anxious and nervous<sup>[20]</sup>. However, in his experiment, the preoperative education strategy did not show obvious advantages in the final medical effect of patients after surgery. Yoon and his partners pointed out in the review that personalized preoperative education is the effective hand segment to improve the therapeutic effect. In their experiment, each patient received pre-operation education specially designed for himself. The content of pre-operation education is basically the same, but the way and emphasis of the narration are tailored to the patient's own situation. The final experimental results show that patients receiving personalized preoperative education have about 1 day or so less hospital stay than patients not receiving preoperative education.

## 2. Physical therapy on the day of surgery

In the study, it was found that the average hospitalization time of patients can be reduced by fixing the patients in a straight sitting position on the day of surgery (the patient can move when the certificate is guaranteed) and performing physical therapy twice a day after surgery. Chan and his collaborators concluded that 75 femoral nerve block should not be used excessively<sup>[20]</sup> through the pain control plan for femoral nerve block and meta-analysis method. The reason is that this method may aggravate quadriceps amyotrophy and even cause other complicated diseases, such as femoral neuropathy, neuritis, dyskinesia, easy fall after operation, etc. From then on, it can be concluded that improper physical therapy such as femoral nerve block will lead to the impairment of patients' body functions and increase the length of hospitalization. In addition, Husted and others found that physical therapy on the day of surgery is of great help to improve postoperative recovery, and the faster recovery of the patient's body also accelerates the progress of hospitalization. Ibrahim and his colleagues found that 4-6 hours of limb fixation after surgery can help patients faster establish functional recovery of body, shorten hospitalization time, and even significantly improve the therapeutic effect of limbs<sup>[14]</sup>.

## 3. Multimodal pain control

Seventeen articles pointed out that multi-mode pain drug intervention is helpful to shorten the hospitalization time of patients. Moreover, the use of analgesic drugs at multi-receptor sites can also improve the medical treatment effect of patients<sup>[1][9-12][14][16][18][20][22-24][27]</sup>. Six articles confirmed this conclusion with clinical data. Maheshwari and others pointed out that comprehensive application of multimodal analgesic methods can help patients participate in recovery activities more easily, thus improving recovery progress and shortening hospital stay<sup>[9][18]</sup>. Accelero suggests that patients who use various analgesic drugs are less likely to suffer from postoperative complications<sup>[9]</sup>. In the clinical experimental observation of 403 patients, Ayalon, and colleagues found nonsteroidal anti-inflammatory drugs, COX-2, corticosteroid drugs used at the same time can shorten the hospitalization time of patients, reduce the pain during treatment, reduce the risk of complications and accelerate the recovery of limb function<sup>[10]</sup>. According to the report of Mayo Clinic in the United States, the use of multi-mode pain control methods in surgical operations can reduce the 1999 and US dollar

medical expenses. Regan and others pointed out that multi-site analgesic drugs can help patients participate in physics earlier after total knee replacement surgery treatment<sup>[1]</sup>, timely administration of effective analgesic drugs to patients after surgery can enable them to participate in limb exercise faster, accelerate functional recovery, and further shorten hospitalization time<sup>[12]</sup>.

## 4. Pre-discharge preparation

In the nursing process of total knee replacement surgery, it is also extremely important to guide patients to prepare for discharge in advance. Knowing the discharge arrangement can reduce the psychological pressure during the recovery period, improve the recovery speed and shorten the hospitalization time of the patients. The article points out that letting patients know their expected time of discharge and preparing for discharge in advance can help patients dispel their worries and recover wholeheartedly. Such nursing strategies are more effective in reducing medical expenses and improving the quality of surgery. Husted pointed out in his research that for patients undergoing total knee replacement surgery, both medical staff and patients should know about the approximate time of discharge from hospital, and should also know about the medical plan before discharge from hospital. Accelerero pointed out that nurses need to communicate with patients in a timely manner to ensure that patients understand the hospitalization arrangements, know the approximate length of hospitalization, and be psychologically prepared before discharge from hospital<sup>[9]</sup>. Ibrahim and research partners found that medical expenses and hospital stay were greatly increased when patients undergoing total knee arthroplasty were informed of the time of discharge. At the same time, if the medical staff inform the patients of the condition to which they will be discharged immediately, the reduction of expenses and hospitalization time will be more obvious. According to the research of Mayo Clinic in the United States, in order to achieve the best surgical effect of total knee replacement, patients should know the discharge schedule in advance, instead of completing medical treatment in hospital for a long time in confusion<sup>[19]</sup>. McGinley said in his research that in the treatment of total knee replacement surgery, patients and medical staff should clearly define the discharge schedule, know when to discharge and to what extent the patients can be discharged. The hospital should ensure that the patients are discharged in time, which is also beneficial to the recovery of the patients' literature<sup>[22]</sup> pointed out that for patients undergoing total knee replacement, it is crucial for the recovery of patients to fully understand the discharge standard and schedule and to be familiar with exercise procedures.

## 5. Comprehensive nursing strategy to reduce hospitalization time of total knee replacement patients

According to the above description, the research results of medical institutions and research units at home and abroad are of great significance for hospital medical staff to determine comprehensive nursing strategies for patients undergoing total knee joint replacement. Comprehensive nursing strategy can optimize the patient's medical effect, standardize the medical care process, reduce unnecessary hospitalization consumption, improve medical quality, improve patient satisfaction, improve surgical effect and save medical costs. The publication of these scientific research results provides a new way of thinking for the medical staff in the orthopedic ward of the hospital, and also provides a reference for optimizing the treatment process of total knee arthroplasty. Based on the experimental data and research results, we can come up with a comprehensive nursing strategy to reduce the hospitalization time of patients undergoing total knee arthroplasty, which can further improve the quality and quantity of medical care and serve the health care industry in China.

Comprehensive nursing strategies for total knee arthroplasty involve preoperative education, physical therapy on the day of surgery, multimodal pain intervention and pre-discharge preparation. First of all, adequate preoperative education is very necessary for the treatment of patients, and preoperative education should be detailed, professional and formal as far as possible, and the adjustment of educational methods should be made according to the patient's personality characteristics and actual psychological conditions, so as to guide patients to actively deal with surgical treatment and eliminate anxiety and other adverse psychology. Secondly, arranging physiotherapy measures to accelerate the recovery of patients on the day of surgery is helpful to meet the urgent needs of patients for exercise ability and physical fitness, reduce the occurrence of complications while assisting the recovery of the body, and physiotherapy

on the day of surgery can improve the strength of knee joints, increase the range of activities, and make patients more active in treatment. Thereby ensuring the treatment quality and safety and improving the treatment efficiency. Third, multi-mode pain suppression can better complete the pain relief task after surgery. Pain relief intervention can reduce the risk of complications, make patients more comfortable, participate in the medical care process more actively, improve the postoperative functional recovery efficiency, and further shorten the hospitalization time. Finally, pre-hospital preparation is also an important means to ensure medical effect and shorten hospitalization time. Both the medical staff and the patient should work out the hospital's standard and date, so that doctors can implement the treatment process more decisively, patients will be more responsible for their own recovery, and actively adjust themselves to meet the discharge standard and reduce the length of stay.

According to the test results of each factor in the research paper, it can be concluded that combining the above four nursing factors and determining the above nursing strategy is conducive to ensuring the treatment effect of total knee arthroplasty, shortening the hospitalization time of patients and improving the treatment efficiency and quality. This comprehensive nursing strategy has great reference value and practical significance in clinical practice.

## 6. Conclusion

According to the analysis, a comprehensive nursing strategy involving four major factors including preoperative education, physical therapy on the day of surgery, multi-mode pain control and pre-discharge preparation was proposed. This strategy can not only ensure the therapeutic effect of total knee arthroplasty, but also shorten the hospitalization time of patients, guide clinical practice and improve the therapeutic efficiency and quality. This strategy provides reference for the treatment and nursing of patients who are undergoing joint replacement of the TKA in the orthopedic ward of the hospital, and also provides methodological reference for determining comprehensive nursing plans.

## References

1. Regan E N, Phillips F, Magri T. Get a leg (or two) up on total knee arthroplasty. *Nursing*, 2016, 2013, 43(7): 32-37.
2. Centers for Disease Control and Prevention (CDC). Public health and aging: projected prevalence of self-reported arthritis or chronic joint symptoms among persons aged > 65 years--United States, 2005-2030. *MMWR. Morbidity and mortality weekly report*, 2003, 52(21): 489.
3. Pine M, Fry D E, Jones B L, *et al.* Controlling costs without compromising quality: paying hospitals for total knee replacement. *Medical care*, 2010, 48(10): 862-868.
4. Hines P A, Kevin M Y. The changing reimbursement landscape: nurses' role in quality and operational excellence. *Nursing Economics*, 2009, 27(1): 7.
5. Tomek I M, Sabel A L, Froimson M I, *et al.* A collaborative of leading health systems finds wide variations in total knee replacement delivery and takes steps to improve value. *Health Affairs*, 2012: 10.1377.
6. Polit D F, Beck C T. *Nursing research: Generating and assessing evidence for nursing practice*. Lippincott Williams & Wilkins, 2008.
7. Duvall J J, Andrews D R. Using a structured review of the literature to identify key factors associated with the current nursing shortage. *Journal of Professional Nursing*, 2010, 26(5): 309-317.
8. Jones S, Alnaib M, Kokkinakis M, *et al.* Pre-operative patient education reduces length of stay after knee joint arthroplasty. *The Annals of The Royal College of Surgeons of England*, 2010, 93(1): 71-75.
9. Accelero Health Partners. Length of Stay Is Critical for Total Hip and Knee Replacement Cost of Care. Canonsburg, PA: Accelero Health Partners, 2014.
10. Ayalon O, Liu S, Flics S, *et al.* A multimodal clinical pathway can reduce length of stay after total knee arthroplasty. *HSS journal*, 2011, 7(1): 9-15.
11. Berger R A, Sanders S A, Thill E S, *et al.* Newer anesthesia and rehabilitation protocols enable outpatient hip replacement in selected patients. *Clinical Orthopaedics and Related Research®*, 2009, 467(6): 1424-1430.
12. Cook J R, Warren M, Ganley K J, *et al.* A comprehensive joint replacement program for total knee arthroplasty: a descriptive study. *BMC musculoskeletal disorders*, 2008, 9(1): 1.
13. Hypnar L A, Anderson L. Attaining superior outcomes with joint replacement patients. *Journal of Nursing*

Administration, 2001, 31(11): 544-549.

14. Ibrahim M S, Khan M A, Nizam I, *et al.* Peri-operative interventions producing better functional outcomes and enhanced recovery following total hip and knee arthroplasty: an evidence-based review. *BMC medicine*, 2013, 11(1): 1.
15. LIN P C, HUNG S H, WU H F, *et al.* The effects of a care map for total knee replacement patients. *Journal of clinical nursing*, 2011, 20(21-22): 3119-3127.
16. Vanhaecht K, Bellemans J, De Witte K, *et al.* Does the organization of care processes affect outcomes in patients undergoing total joint replacement? . *Journal of evaluation in clinical practice*, 2010, 16(1): 121-128.
17. Lucas B. Total hip and total knee replacement: preoperative nursing management. *British Journal of nursing*, 2008, 17(21):1.
18. Maheshwari A V, Blum Y C, Shekhar L, *et al.* Multimodal pain management after total hip and knee arthroplasty at the Ranawat Orthopaedic Center. *Clinical Orthopaedics and Related Research®*, 2009, 467(6): 1418-1423.
19. Mayo Clinic Staff. Knee replacement definition[R].Rochester: Mayo Clinic, 2014.
20. McDonald S, Hetrick S E, Green S. Pre-operative education for hip or knee replacement. *The Cochrane Library*, 2004.
21. McGinley A. Factors affecting length of stay following total knee replacement: a clinical practice audit. *Journal of Orthopaedic Nursing*, 2008, 12(3): 171-178.
22. Parisien K R, Valentine D, Hoffman V, *et al.* Enhancing the Patient's Experience Through the Total Joint Replacement Continuum of Care. *Orthopaedic Nursing*, 2012, 31(6): 322-325.
23. Shakespeare D, Kinzel V. Rehabilitation after total knee replacement. *The Knee*, 2005, 12(3): 185-189.
24. SooHoo N F, Lieberman J R, Farnig E, *et al.* Development of quality of care indicators for patients undergoing total hip or total knee replacement. *BMJ quality & safety*, 2011, 20(2): 153-157.
25. Wheeler E C. The CNS's impact on process and outcome of patients with total knee replacement. *Clinical Nurse Specialist*, 2000, 14(4): 159-172.
26. Yoon R S, Nellans K W, Geller J A, *et al.* Patient education before hip or knee arthroplasty lowers length of stay. *The Journal of arthroplasty*, 2010, 25(4): 547-551.
27. Chan E Y, Fransen M, Parker D A, *et al.* Femoral nerve blocks for acute postoperative pain after knee replacement surgery. *The Cochrane Library*, 2014.