وزارة الصحة
Ministry of Health

المديرية العامة لمستشفى خولة
Directorate General of Khoula Hospital

Orthopedic Department

Document Title	Guideline for Enhanced Recovery After Peri-Trochanteric Hip Fracture Stabilization Surgery
Document Type	Guideline
Directorate/Institution	Directorate General of Khoula Hospital
Targeted Group	All healthcare Professionals Involved in Care of Patient with Peri-trochanteric Fracture.
Document Author	Author's name next page
Document Reviewer	Reviewer's name next page
Release Date	August 2025
Review Frequency	Three years

Validated by		**Approved by**	
Name	Dr. Sleema Al Aisary	Name	Dr Abdullah Al Salti
Designation	Director of Quality Management &Patient Safety	Designation	Acting Director General د. عبدالله بن محمد الصلتي المدير العام المساعد للشؤون الطبية Dr. ABDULLAH MOHD. AL-SALTI Asst. D.G. of Medical Services
Signature		Signature	
Date	04/08/2025	Date	04/08/2025

سلطنة عمان - وزارة الصحة
المديرية العامة لمستشفى خولة
مكتب المدير العام
D.G. Office
DIRECTORATE GENERAL OF KHOULA HOSPITAL
SULTANATE OF OMAN - MINISTRY OF HEALTH

Acknowledgement

We would like to acknowledge the team that has written and review the first version of this document,

Names of authors:

1. Dr. Ismail Al Habsi, Consultant, Orthopedic Department
2. Ms. Saida Al Harthi, Sr.Specialist Nurse.
3. Ms. Shafia Al Raqadi, Sr. Nurse -Nursing In-charge OU1
4. Ms. Nuha Al Amri Sr.Nurse, TKR ward Nursing In-Charge
5. Ms. Asila Al Shukri, Sr. Nurse - Deputy Nursing In-charge OC
6. Ms. Shaimaa Al Alawi, Sr. Nurse - Deputy Nursing In-charge OU1
7. Ms. Mariyam Al Sulaimi, Sr. Nurse- OU1 Nursing Shift In-Charge
8. Ms. Marwa Al Zidjali, Staff Nurse OT
9. Ms. Aisha Al Fudhaili,Sr.Nurse - Deputy Nursing In-charge OU2

Names of Reviewers

1. Dr. Jatinder Luthra, Consultant Orthopedic Department
2. Dr. Abdullah Al Jadidi, Sr. Consultant Anesthesiologist, Chairperson of ERAS Task-force
3. Dr. Hanna Al Ghanami, Sr Specialist Anesthetist
4. Dr. Khalifa Al Yousifi, Sr. Consultant Emergency Medicine
5. Ms. Shamsa Al Sharji: Director of Nursing Affairs
6. Ms. Huda Al Abri, specialist Nurse, Head of Accreditation Department
7. Ms.Amani Al Amri, Sr. Nurse - ED Nursing In-Charge
8. Mr.Mohamed Abdelhadi Ahmed Teleb, Senior Physiotherapist
9. Ms.Nayfeen Al-Kharusi, Senior Physiotherapist

Contents:

1. Acronyms: 4
2. Definitions 4
3. Introduction 5
4. Purpose 5
5. Scope 5
6. Structure 6
7. Responsibilities 14-16
8. Document History and Version Control 16
9. Related Documents 16
10. References 17-19
11. Annexes 20-24

Acronyms:

PHF	Peri-trochanteric Hip Fracture
DGKH	Directorate General of Khoula Hospital
HCP	Healthcare Professionals
ERAS	Enhanced Recovery After Surgery
ED	Emergency Department
TC	Trauma Center
NPO	Nil per Oral
VAS	Visual Analog Scale
NSAID	Non-Steroid Anti-Inflammatory Drugs
PONV	Post-Operative Nausea and Vomiting
DVT	Deep Vein Thrombosis
VTE	Venous thromboembolism
PAC	Pre-Anesthesia Check up
PCA	Patient Control Analgesia
JIA	Joint infiltration Analgesia
LIA	Local Infiltration Analgesia
FIB	Facial Iliac Block
FNB	Femoral Nerve Block
LMWH	Low molecular weight heparin
Sc	Subcutaneous

1. Definitions

1.1 **Enhanced Recovery after Surgery (ERAS):** is a "standardized, multi modal intervention,multi- disciplinary approach, evidence-base protocol for perioperative care for electivesurgeries.

1.2 **Pre-operative Stage:** A term applied to any intervention administered before surgery

1.3 **Intraoperative Stage:** A term applied to any intervention administered during surgery

1.4 **Post-operative Stage:** A term applied to any intervention administered after surgery

1.5 **Opioid**: A compound resembling opium in addictive properties or physiological effects

Guidelines for Enhanced Recovery after Peri-Trochanteric Hip Fracture Stabilization Surgery

Chapter one:

2. Introduction

Peri trochanteric hip fractures (PHF) are a significant public health issue among the elderly in Oman. The directorate general of Khoula hospital is the primary trauma center with experienced orthopedic surgeons and a strong reputation, resulting in many PHF cases being referred to their capable regional hospitals. Most PHF patients are elderly females with comorbidities, leading to extended hospital stays, higher infection risk, and complications. As the population ages, PHF incidence continues to rise, increasing mortality, functional decline, hospital admissions, and costs.

Reducing healthcare costs can be achieved by shortening hospital stays and preventing postoperative complications through creating clear guidelines for multidisciplinary teams from admission through discharge and home care are strategies used to improve postoperative outcomes for PHF patients. These approaches have been shown to decrease the length of stay, hospital costs, and hospitalization load while supporting patient health.

2. Purpose:

The of this guideline to:

2.1 Enhance early recovery and facilitate the reduction of the length of stay after surgery for patients with PHF

2.2 standardize the care for patient with PHF from a day of admission to the discharge day and up to home care.

3. Scope

This guideline of the DGKH, applies to all the healthcare professionals who involve in the patients' care undergoing surgery for PHF stabilization.

Chapter Two:

4. Structure

4.1 **Optimization of Medical Conditions**:

Emergency Department (ED) Doctor / Admitting Orthopedic Surgeon should perform full physical assessment and obtain medical history of the patient (Beta-lactams allergy, MRSA, bleeding/clotting disorder, Renal function for vancomycin dosing, BMI, etc.) and identify surgical risk with underling diseases through:

a. Blood investigations based on the patients' medical history (e.g. CBC, LFT, RFT, and coagulation profile, etc.)
b. Imaging test (X-Ray including chest X-rays, pelvis AP, hip lateral view once admission approved)
c. **CT** scan has to be done at ED as per indication before referring the case to orthopedic on-call doctor.
d. ECG
e. Nasal swab and body screening as per the Infection Prevention Policy

4.2 **Initially Pain Management as per Pain Management Protocol and (ERAS Principle**):

a. Paracetamol 1g IV
b. Fentanyl 1micg/kg IV or Morphine 0.1mg/kg IV (Opioid should be minimized and if tis necessary it shall be given slowly over 3 minutes)
c. Facial Iliac Block (FIB) 20 ml of 0.5% Bupivacaine or Femoral Nerve Block (FNB) of 10 ml of 0.5% Bupivacaine.
   (To be done by expert ED physician if there is no expert who can perform FIB)

4.3 **Initially IV Therapy (ERAS Principle)**

a. Based on Hydration assessment and medical comorbidity Intravenous fluids therapy has to be initiated as soon as possible at ED especially for the elderly patients with poor intake or hypotension.
b. Ensure the large bore (18-20) IV line is inserted in high risk or unstable patients.
c. dehydration had to be corrected and euvolemia to be maintained (isotonic e.g. Normal Saline 0.9% NACL or Ringer's Lactate)
d. Monitor and correct sodium, potassium, calcium and magnesium imbalance as these may affect anesthesia and cardiac function

4.4 **Other Pre-Operative Procedures at ED**

a. Skin traction is not recommended as shown no significant pain relief, but appropriate leg support by pillows is necessary
b. Refer the case to the orthopedic on-call (phone call and at Al-shifa) within an hour of PHF confirmation.
c. The orthopedic doctor has to see the patient within 60 minutes after being informed through the phone call then the referral is to be entered at Al-Shifa System immediately by the referring doctor after the call.
d. The ED nurse should take care of the bony prominent pressure areas until the patient is transferred to OT or to the ward
e. The patient has to be transferred to the ward within 30 minutes after the patient has been admitted to the system (Alshifa System) by the on-call surgeon.
f. Patients with PHF should not spend more than 3 hours in the ED.
g. Informed consent should be obtained at ED by the orthopedic surgeon, once the surgery is indicated and the risks with benefits should be explained to the patient and relatives clearly.
h. Anesthetist referral should be done by the orthopedic surgeon (on-call) immediately during admission procedure.
i. During the admission procedure, the surgeon shall ensure immediate referrals have been done through Al-Shifa to (physiotherapist, nutrition

therapist, pain management etc.) and immediate referral to clinical pharmacist and other concerned specialties teams when the patient has other medical co-morbidities.

j. Osteoporosis scan to be obtained as the baseline for the management plan and BMD shall be done postoperatively
k. Immediate request for blood screening MRSA, MDR, CRE, etc. is necessary only if previously known or planned for Hemi/Total hip replacement
l. ED staff nurse should inform the ward or OT at least 15 minutes before shifting the patient.
m. ED staff should ensure pain control is ongoing while the patient is in ED until the patient is handed to OT or the ward nurse.
n. The surgery should be performed within 36 hours of injury especially for elderly patients

4.5 In-Patient Ward Prior to the Surgery (ERAS Principle):

a. Both a nurse and a surgeon should ensure the admission procedure is being done accordingly as per admission policy and procedure.
b. Continue medical and nonmedical pain management.
c. The injured leg, should be supported with the pillows to the level of patient's comfort.
d. Physiotherapist should educate the patient the pre-and post-breathing exercises.
e. Physiotherapists shall ensure the patient knows that will be mobilized out of the bed within 24 hours after surgery.
f. The surgeon and the nurses should ensure the patient and the relatives know the expected length of stay in the hospital is not more than 4 days unless there are complications or medical indications.
g. The nurse should ensure all the necessary referrals have been immediately done during the admission procedure
h. The educational materials should be given to the patient by assigned nurse immediately during the admission procedure.

4.6 **Pre-Operative Nutrition Optimization (ERAS Principle)**

a. Prevent malnutrition by thorough assessment and screening of the elderly/fragile patients

b. Maintain metabolic stability: Assess dietary history and appetite while encouraging oral intake

c. If surgery is delayed minimize fasting by allowing clear fluid intake (Carbohydrate loading if not contraindicated) up to 2 hours before taken to OT if not at risk for aspiration

d. Vitamin D, Calcium and High Protein oral in-take supplements

4.7 **Preoperatively Fasting (ERAS Principle)**

a. As per ERAS and Fasting guideline; prolonged fasting must be avoided

b. After clearance from the Pre-anesthesia checkup (PAC); the clear fluid can be allowed until 2 hours before shifting patient to OT (Type of liquids allowed are clear apple juice and water only).

c. The patient should have nil per orally (NPO) 6 hours before surgery or 8 hours for the high-risk cases such as CRF, DM, etc.

d. The dietician shall follow the case and allow the carbohydrate loading drink of 12.5% (Carbohydrate containing clear drink with proven safety profile unless otherwise contraindicated)

e. The dietician shall make appropriate plan for the patient (pre-post operatively)

f. Avoid the routine preoperative sedative hypnotics even with the patient who is significantly anxious due to increase cognitive dysfunction, and increase pharyngeal/laryngeal dysfunction

4.8 **Preoperative IV Fluid Therapy**

a. Preoperative IV Fluids shall be minimized, but not restricted, however, the Normal Saline lock in Pre-Op, Ringers Lactate or Plasmalyte shall be considered most of the time, unless they are contraindicated.

b. The stroke volume optimization and the fluid therapy shall be continued with the advanced hemodynamic monitoring

4.9 **Preoperative Prophylaxis:**

a. If the case was not posted as urgent from ED; Chlorhexidine bath has to be given at least 12 hours before the surgery.

b. Thromboprophylaxis as ERAS Principle: Low molecular weight heparin (LMWH) or heparin IV bay be started if surgery is delayed

c. Antibiotic prophylactic dose to be given primarily as per protocol.

d. Prophylaxis for Post-Operative Nausea and Vomiting (PONV) management:

- As per hip and knee ERAS guidelines; if 1-2 risk factors present preoperatively; then 2 antiemetic (Dexamethasone and 5 HT3 antagonist) will be required
- The rescuer third drug {Dopamine antagonist (Metoclopramide)} should be from different group if PONV occurs.

4.10 **Pre-operative Multimodal Analgesia:**

a. As per Protocol of Knee and Hip Arthroplasty Pain Management in Recovery Room:

b. The anesthetist should prescribe pre-emptive analgesic during the pre-operative assessment (Brufen 400mg + Gabapentin 300mg)

c. The staff nurse in OT should help in preparation of Epidural for patient control analgesia (PCA) infusion or Femoral nerve block.

4.11 **Intraoperative Nutrition Optimization (ERAS Principle)**

a. Avoid Overhydration: use goal directive fluid therapy to reduce gut edema and ileum risk.

b. Maintain perfusion: avoid hypovolemia to support GI function post-op

4.12 **Intraoperative Multimodal Analgesia:**

a. Anesthetic Management of General Anesthesia GA vs. Regional; the patient can be anaesthetized by both techniques- not to delay in discharge comparing both techniques.

b. SA- Intrathecal opioids- the low dose recommended to avoid opioid induced complications (Fentanyl or Preservative Morphine 200 mcg)

c. The Epidural can be used but not routinely recommended as it can delay in the patient discharge due to hypotension, urinary retention, pruritus, reduce mobility and delay ambulation.

d. The local infiltration analgesia (LIA)- Is not recommended, but the Femoral Nerve Block- can be used, but not routinely due to persistent of the quadriceps weakness and delay the patient ambulation.

e. The anesthetist should manage the patient's pain during all intraoperative period by ensuring that LIA is administer by the surgeon accordingly and on time.

4.13 **Post-Operative Nutrition Optimization (ERAS Principle)**

a. Resume the oral intake as tolerate, start with fluid progress to soft, then solid

b. High protein diet (targe1.2-1.5g/kg/day) or oral nutrition supplements

c. Continue vitamin D, Calcium, Iron, Zinc if needed

d. Refer to dietitian if patient is at high risk for malnutrition

4.14 **Post Operatively Multimodal Analgesia:**

a. Patient control analgesia (PCA) may not help in elderly patients as it needs good cooperation.

b. Minimize the use of Opioids, but short acting Opioids can be used, with the regional techniques intraoperative.

c. The pain management procedure should be ongoing from OT to the wards for at least 48 hours after surgery and the injectable medications to be given even if the block was given to the patient.

d. Keep into consideration the Non-Opioid /NSAIDS (if there is no any contraindications)

e. Oral Analgesics when compulsory (Acetaminophen) after 48 hours.

4.15 **Postoperative Procedures (ERAS Principle):**

a. Patient is allowed PO intake in place of intravenous fluid as soon as it is tolerated to facilitate the excretion of waste by maintaining intake and output balance chart to ensure body fluid balance. The patient remains NPO, but resume orally as soon as tolerated

b. Salt and water overload are avoided; isotonic buffered solution has been considered

c. Urinary catheter removed as soon as possible within 6 hours after surgery

d. Physiotherapist ensured the proper rehabilitation of the prevention of thrombosis, strengthen muscles for the patient to be independent for the activities of daily living as soon as possible.

e. The surgeon considers the use of Aspirin and mechanical prophylaxis such as low molecular weight heparin post operatively. Unfractionated Heparin can be used for the patients with de-arranged renal function.

f. For high risk group or previous thromboembolic event case to be discussed with Hematologist for proper anticoagulant and duration.

g. As per National Antimicrobial guidelines; diluted beta-dine (Antimicrobial) lavage to be used to prevent surgical site infection and Peri-prosthetic joint infection

h. The prophylaxis should be considered the for post-operative nausea and vomiting

i. Bisphosphonates required as yearly as possible for Osteoporosis patients once the BMD results is released

4.16 **Post- Operatively VTE Prophylaxis (ERAS Principle)**

a. Initiation timing has to be 6-12 hours post operatively once hemostasis is being secured
b. First-line agent is low molecular weight heparin e.g. Enoxaparin subcutaneous (Sc) 40mg once a day.
c. Alternative agents are the Delteparin 5000 IU Sc daily/Rivaroxaban 10 mg daily or Apixaban 2.5 mg BID/Fondaparinux 2.5mg Sc for heparin allergic patients for 28-35 days .
d. For high bleeding risk cases you have to delay in using pharmacological agents, use mechanical measures (e.g. pneumatic compression and stockings)
e. For low risk patient trans to oral agents 81-100 mg/days after 10-14 days of LMWH
f. Close monitoring for bleeding (surgical site, bruising, platelet count if on heparin and renal function test if on LMWH or direct Oral Anticoagulants

4.17 **Post OP-Mobilization Procedure:**

a. Physiotherapists and assigned nurses should ensure that the patient has started the movement and the physical exercises on the bed within 6 hours after surgery.
b. Physiotherapists should ensure that the patient is mobilized out of the bed and start Non-Weight Bearing /Full weight bearing (based on Surgeon Advise) walking within 24 hours as per ERAS guideline for lower limbs arthroplasty.
c. The surgeon should consider post-operatively chemo-thrombolytic prophylaxis (Aspirin) for 28 days.

5.11.Discharge Procedure:

a. The assigned nurse should ensure that the patient has given full verbal post-op and follow up healthcare education before is discharged

b. The assigned nurse should ensure the patient is cleared and discharged from the physiotherapy before giving discharge papers.

c. The assigned nurse should ensure the patient has been given the ERAS of PHF educational materials (Appendix 1) with complete discharge papers.

d. The surgeon should give a proper explanation to the patient /relative regarding the post-operative care at home until follow up day.

e. The surgeon should not allow the patient to stay-in the hospital for more than 4 days without clinically indications

f. Adequate analgesic to be prescribed for the patient to take home

g. Provide adequate thrombolysis-Prophylaxis to continue after discharge

h. The assigned nurse should give the health education about wound care at home,

i. The nurse should ensure that the patient knows the signs and symptoms of infections and when to seek medical advice urgently.

j. The nurse should explain to the patient with the simple and clear language about the post-op follow up.

Chapter Three:

6 Responsibilities

6.1 The Directors/Heads of Departments shall:

6.1.1 Ensure all the staffs are aware and adhere to this guideline implement it effectively.

6.1.2 Monitor and take appropriate action based on the auditing report from auditors

6.1.3 Monitor the clinical practice associated with effectiveness of implementation of the Guideline and take necessary action for better service

6.2 The Orthopedic Consultant/ Doctors shall:

6.2.1 Ensure all doctors adhere to this guideline.

6.3 The Anesthetist Consultant/ Doctors shall:

6.3.1 Emphasize to all doctors the importance of adhering to this guideline.

6.4 The Director of Nursing Affairs shall:

6.4.1 Emphasize to all Head of sections and Unit supervisors the importance of adhering to this guideline

6.4.2 Ensure auditing plan is being implemented accordingly and the auditing is conducted to all associated clinical areas.

6.5 The Head of Section / Unit Supervisor / Shift Supervisor Shall

6.5.1 Reinforce all nursing staff to adhere to this guideline

6.5.2 Emphasize the frequently auditing and action plan are done frequently

6.6 The Associated In-charges of ED, Wards, OT, and OPD Shall:

6.6.1 Ensure all nurses are adhering to this guideline

6.6.2 Ensure proper supervision is given to all staff particularly the new nurses regarding this guideline

6.6.3 Performed self and cross auditing frequently and take necessary action for low compliance

6.7 All Nurses Shall:

6.7.1 Adhere to the guideline of ERAS for PHF.

6.7.2 Perform self and cross auditing with action plan and report to concern departments (Surgeons, Anesthetists, dietician, Physiotherapist etc.) to get their action plan and improvement based on their score obtained

6.8 The Rehabilitation Services Department (Physiotherapy) shall:

6.8.1 Adhere to this guideline

6.8.2 Performed self and cross auditing frequently and take necessary action for low compliance

6.8.3 Participate in interdisciplinary assessments and discharge.

6.8.4 Provide patient/relative teaching/training on exercise therapy which needs to be performed at home.

6.8.5 Advice patients about the required equipment and follow up appointment with Medical Rehabilitation Services Department

6.9 The Nutrition Therapy Head Shall:

6.9.1 Adhere to this guideline

6.9.2 Respond to medical requests and take necessary action on time

6.9.3 Instruct the patient regarding nutrition and any dietary modifications (if indicated).

7 Document History and Version Control:

Version	Description	author name	Review Date
1	Initial Release	Dr. Ismail Al-Habsi Ms. Saida Al-Harthi	2028

8 Related Documents:

8.1 Total Knee Replacement Rehabilitation Protocol

8.2 Protocol of Knee and Hip Arthroplasty Pain Management

8.3 National Antimicrobial Guidelines

8.4 Preoperative fasting guidelines for surgical and Non-surgical Procedures

8.16 Admission policy and procedure

9. References

1. Yin, M., Yan, Y., Fan, Z., Fang, N., Wan, H., Mo, W., & Wu, X. (2020). The efficacy of Enhanced Recovery after Surgery (ERAS) for elderly patients with intertrochanteric fractures who received surgery: study protocol for a randomized, blinded, controlled trial. *Journal of orthopedic surgery and research*, *15*, 1-8.
2. Ju, J. B., Zhang, P. X., & Jiang, B. G. (2019). Risk factors for functional outcomes of the elderly with intertrochanteric fracture: a retrospective cohort study. *Orthopedic Surgery*, *11*(4), 643-652.
3. Fan, J., Xu, X., Zhou, F., Zhang, Z., Tian, Y., Ji, H., ... & Hou, G. (2021). Risk factors for implant failure of intertrochanteric fractures with lateral femoral wall fracture after intramedullary nail fixation. *Injury*, *52*(11), 3397-3403.
4. Choi, Y. S., Kim, T. W., Chang, M. J., Kang, S. B., & Chang, C. B. (2022). Enhanced recovery after surgery for major orthopedic surgery: a narrative review. *Knee surgery & related research*, *34*(1), 8.
5. Fischer, H., Maleitzke, T., Eder, C., Ahmad, S., Stöckle, U., & Braun, K. F. (2021). Management of proximal femur fractures in the elderly: current concepts and treatment options. *European journal of medical research*, *26*, 1-15.
6. Zhu, W., Yan, Y., Sun, Y., Fan, Z., Fang, N., Zhang, Y., ... & Wu, X. (2021). Implementation of Enhanced Recovery After Surgery (ERAS) protocol for elderly patients receiving surgery for intertrochanteric fracture: a propensity score-matched analysis. *Journal of Orthopedic Surgery and Research*, *16*, 1-11.
7. Zhai, C., & Lin, Y. (2024). Impact of fast-track rehabilitation nursing on pressure ulcers and postoperative complications in patients with inter-trochanteric fractures: A meta-analysis. *International Wound Journal*, *21*(4), e14534.
8. Ghouri, S. I., Mustafa, F., Kanbar, A., Al Jogol, H., Shunni, A., Almadani, A., ... & El-Menyar, A. (2023). Management of traumatic femur fractures: a focus on the time to intramedullary nailing and clinical outcomes. *Diagnostics*, *13*(6), 1147.
9. Li, J. H., Li, P., & Li, Y. (2024). Effect of rapid rehabilitation care on surgical site wound infection and pain in patients with intertrochanteric femoral fractures: A meta-analysis. *International Wound Journal*, *21*(4), e14540.
10. Sameer, M., Muthu, S., & Vijayakumar, P. C. (2023). Enhanced recovery after surgery (ERAS) protocol in geriatric hip fractures: an observational study. *Cureus*, *15*(7).
11. Iuliano, S., Poon, S., Robbins, J., Bui, M., Wang, X., De Groot, L., ... & Seeman, E. (2021). Effect of dietary sources of calcium and protein on hip fractures and falls in older adults in residential care: cluster randomised controlled trial. *bmj*, *375*.
12. Wakefield, S. M., Rodham, P. L., & Giannoudis, P. V. (2024). The management of intertrochanteric hip fractures: an update. *Orthopedics and Trauma*, *38*(2), 70-77.
13. Shi, X., & Ma, W. (2024). Effect of collaborative nursing method based on RAM model on postoperative functional reconstruction, soft tissue pain and living quality in patients with femoral trochanter fracture. *BMC Musculoskeletal Disorders*, *25*(1), 627.
14. Yin, M., Yan, Y., Fan, Z., Fang, N., Wan, H., Mo, W., & Wu, X. (2020). The efficacy of Enhanced Recovery after Surgery (ERAS) for elderly patients with

intertrochanteric fractures who received surgery: study protocol for a randomized, blinded, controlled trial. *Journal of orthopedic surgery and research*, *15*, 1-8.
15. Liu, S. Y., Li, C., & Zhang, P. X. (2021). Enhanced recovery after surgery for hip fractures: a systematic review and meta-analysis. *Perioperative Medicine*, *10*, 1-11.
16. Attum, B., & Pilson, H. (2023). Intertrochanteric Femur Fracture. In *StatPearls*. StatPearls Publishing.
17. Wagner, M. (2022) Hip Fracture: Nursing Diagnoses & Care Plans. *Western Governors University.*
18. Bandoim, L. (2017). Intertrochantricantric fracture Diagnosis, Treatment Recovery. *Health Line Media*
19. Sarkies, M. N., Testa, L., Carrigan, A., Roberts, N., Gray, R., Sherrington, C., ... & Sheehan, K. (2023). Perioperative interventions to improve early mobilization and physical function after hip fracture: a systematic review and meta-analysis. *Age and ageing*, *52*(8), afad154.
20. Tarchichi, J., Daher, M., Ghoul, A., Estephan, M., & Mansour, J. (2024). Pre-Operative Traction in Femoral Fractures for Pain Management: A Meta-Analysis of Comparative Studies. Archives of Bone and Joint Surgery, 12(10), 683.
21. Heidari, B., Salimi, R., Saremi, H., & Ghahestani, M. A. (2023). Assessment of Magnesium Sulfate Infusion in Combination with Ketorolac for the Pain Management in Intertrochanteric Fractures; A Randomized Clinical Trial. Archives of Bone and Joint Surgery, 11(6), 414.
22. Zhao, W., Chen, S., Tang, C., & Zhang, C. (2024). The Efficiency of Antiosteoporosis Medicine after Intertrochanteric Fracture Surgery: A Retrospective Study of Refracture Rate, Function Recovery, Complications, and Mortality in the Chinese Elderly Population. The Surgery Journal, 10(01), e11-e19.
23. Tiwari, N., Patil, S., & Popalbhat, R. (2022). Efficacy of Physiotherapy Rehabilitation for Proximal Femur Fracture. Cureus, 14(10).
24. Yokoyama, K., Ukai, T., & Watanabe, M. (2021). Effect of nutritional status before femoral neck fracture surgery on postoperative outcomes: a retrospective study. BMC Musculoskeletal Disorders, 22, 1-7.
25. Irisawa, H., & Mizushima, T. (2022). Relationship between nutritional status, body composition, muscle strength, and functional recovery in patients with proximal femur fracture. Nutrients, 14(11), 2298.
26. Ghasemi, F., Esmaeilnejad-Ganji, S. M., Manafi Rasi, A., Afzal, S., Baroutkoub, M., & Tavassoli, M. (2023). Evaluation of quality of life and associated factors in patients with intertrochanteric femoral fracture. Plos one, 18(11), e0293686.
27. Dangle, J., Kukreja, P., & Kalagara, H. (2020). Review of current practices of peripheral nerve blocks for hip fracture and surgery. Current Anesthesiology Reports, 10, 259-266.
28. Guo, J., Wang, T., Zheng, X., Long, Y., Wang, X., Zhang, Q., ... & Zhang, Y. (2022). Use of Intravenous Paracetamol Preoperatively Favors Lower Risk of Delirium and Functional Recovery in Elderly Patients with Hip Fracture: A Propensity Score-Matched Analysis. Pain Research and Management, 2022(1), 1582727.

29. Calkins, T. E., Culvern, C., Nam, D., Gerlinger, T. L., Levine, B. R., Sporer, S. M., & Della Valle, C. J. (2020). Dilute betadine lavage reduces the risk of acute postoperative periprosthetic joint infection in aseptic revision total knee and hip arthroplasty: a randomized controlled trial. The Journal of Arthroplasty, 35(2), 538-543.
30. Siminiuc, D., Gumuskaya, O., Mitchell, R., Bell, J., Cameron, I. D., Hallen, J., ... & Sarkies, M. (2024). Rehabilitation after surgery for hip fracture–the impact of prompt, frequent and mobilisation-focused physiotherapy on discharge outcomes: an observational cohort study. BMC geriatrics, 24(1), 629.
31. Hofstad, J. K., Klaksvik, J., & Tina, S. W. (2022). Intraoperative local infiltration anesthesia in hemiarthroplasty patients reduces the needs of opioids: a randomized, double-blind, placebo-controlled trial with 96 patients in a fast-track hip fracture setting. Acta Orthopedic, 93, 111.

10. Annexes:

10.1 Appendix: Health Education for Patients before and after Trochanteric Fracture Surgery

During Admission :

When you are in the ward make sure:

- You are oriented to the ward and a call bell kept close to you to get quick assistance
- You have given a copy of your rights and responsibilities to ensure your rights are fulfilled, and you are ready to comply with your responsibilities.
- You have informed a Nurse/Doctor about your allergies and hand to them all your long-term medication to avoid overdose or drugs interaction with hospital new prescribed drugs
- You report immediately any wet floor or any unexpected fall hazards around you

In the Ward Before Surgery :

- Length of hospital stay is expected to be only from 3 to 4 days unless there are medical issues
- Make sure you have Chlorhexidine solution bath before surgery as instructed
- As instructed, you should maintain fasting for 6 hours, but might be allowed for only clear fluids and to stop 2–4 hours before surgery.
- For your safety do not try to abscond the hospital, as you have right to discuss with your healthcare taker
- Follow the healthcare instructions and feel free to ask if you have any doubt

After Surgery :

You Will Be Instructed:

- To start drinking clear fluid, then to solid food once you have regained your Orally tolerance.
- To avoid hot application on the wound after surgery but to use ice packs provided in the ward
- To keep the limb supported with pillows under it longitudinal from hip to the foot
- To do breathing exercise and physical movement on the bed and leg exercise within 4–6 hours after surgery
- To complying with physiotherapists instruction to regain muscle strength which found to reduce pain
- To get out of the bed and be mobilized by physiotherapist using Zimmer/crutches within 12–24 hours after surgery
- Following dietary plan as instructed

- Use non-slippery shoes
- Not to try to walk on the wet floor or out of bed without assistance if you feel dizzy

Discharge Health Education with Home Safety Measures :

- Seek medical advice immediately if you have uncontrolled pain despite all given analgesics, or you have noticed some infection signs such as high fever, excessive fluid discharge on the wound.
- Follow up at nearest health center for alternative dressing and clip/suture removal.
- Follow up all appointments for doctors' visits and for physiotherapy until you are fully discharged from the system.
- Avoid opening dressing and touching the wound at home until the suture is removed and wound is dry
- For lifelong lifestyle changes, you have to avoid squatting, no floor sitting, use high up toilet,
- Ensure your home environment is free from fall hazards and free passage from obstacles
- Use appropriate walking aids as instructed by your healthcare provider
- Do not sit on the lower stool or bend beyond the knees, but always keep the hips higher than the knees
- Get your vision and hearing checked frequently
- Exercise gradually
- Use non-slip-mats and wear well-fitting shoes
- Make your items accessible
- Improve lighting
- Do not walk on the wet floor, wear well-fitting shoes, use non-slip mats and use grab bar in the toilets
- Follow well-balanced diet, drink plenty of fluid, protein rich diet, calcium vitamin D supplements
- Follow the instruction of medicine given and osteoporosis regimen if you are osteoporotic patient

- Get up from chair after half an hour and do not keep your legs cross to each other at any position
- Avoid twisting operated leg or laying on the operated unhealed wound

- **Feel free to contact us for more advice at Directorate General of Khoula Hospital**
- **Orthopedic Department: 22501411-22501457-22501423-22501470-22505059**

التثقيف الصحي للمرضى قبل وبعد جراحة كسر المدور

اثناء التنويم في القسم:

يرجى العلم بما يلي لضمان سلامتك خلال فترة الإقامة في القسم:

- يجب أن تكون على دراية بموقعك داخل القسم، وأن يكون جهاز النداء قريبًا منك لاستخدامه عند الحاجة للمساعدة الفورية.
- تأكد من استلام نسخة من حقوقك وواجباتك، والتزامك بتنفيذها خلال فترة العلاج.
- عليك إبلاغ الطاقم الطبي بأية حساسيات لديك وتسليم كافة أدويتك المزمنة لتفادي خطر الجرعات الزائدة أو التداخلات الدوائية مع الأدوية الجديدة التي قد تُصرف أثناء تواجدك بالمستشفى.
- يرجى الإبلاغ فورًا عن أي أرضيات مبللة أو مخاطر سقوط محتملة في محيطك.
- مدة الإقامة المتوقعة في المستشفى تتراوح بين 3 إلى 4 أيام ما لم تظهر مضاعفات صحية.
- يتوجب الاستحمام بمحلول الكلورهيكسيدين حسب التعليمات قبيل الجراحة.
- يجب الالتزام بالصيام لمدة 6 ساعات قبل الجراحة، وقد يُسمح بتناول السوائل الشفافة فقط حتى ساعتين إلى أربع ساعات قبل العملية وفق التعليمات الطبية.
- حفاظًا على سلامتك، يمتنع الخروج من المستشفى دون علم الفريق الطبي، ويحق لك مناقشة حالتك مع مقدم الرعاية الصحية المختص.
- يُرجى اتباع تعليمات فريق الرعاية الصحية وعدم التردد في طرح أي استفسار.

بعد الجراحة

سيتم توجيهك إلى:

- البدء تدريجيًا في تناول السوائل الشفافة، ثم الطعام الصلب بعد التأكد من القدرة على التحمل الفموي.
- تجنب تعريض موضع الجراحة لأي مصدر حرارة، مع استخدام كمادات الثلج حسب توفرها وتعليمات الفريق.
- إبقاء الطرف المصاب مدعومًا بالوسائد من الورك وحتى القدم.
- ممارسة تمارين التنفس والحركة على السرير، بالإضافة إلى تمارين الساق خلال الأربع إلى ست ساعات الأولى بعد الجراحة.
- الالتزام بتعليمات أخصائي العلاج الطبيعي لاستعادة قوة العضلات والمساهمة في تقليل الألم.
- مغادرة السرير والتحرك بمساعدة أخصائي العلاج الطبيعي باستخدام المساعدات المناسبة (مثل المشاية Zimmer أو العكازات) خلال 12-24 ساعة بعد الجراحة.
- الالتزام بالنظام الغذائي الموصوف وارتداء أحذية مقاومة للانزلاق في جميع الأوقات.
- عدم المشي على أرضيات مبللة أو محاولة مغادرة السرير بدون مساعدة إذا شعرت بالدوار.

التثقيف الصحي وإجراءات السلامة المنزلية عند الخروج

- اطلب استشارة طبية عاجلة في حال الشعور بألم غير مسيطر عليه رغم استخدام المسكنات، أو ظهور علامات عدوى مثل الحمى المرتفعة أو إفرازات زائدة من موضع الجرح.
- راجع أقرب مركز صحي لتغيير الضماد وإزالة الغرز أو الدبابيس حسب المواعيد المحددة.

- التزم بكافة مواعيد المتابعة مع الطبيب وأخصائي العلاج الطبيعي حتى تحقيق الشفاء الكامل والخروج النهائي من خطة العلاج.
- امتنع عن فتح الضماد أو لمس مكان الجرح في المنزل حتى التأكيد الطبي على جفاف والتئام الجرح.
- لتعديل نمط الحياة: تجنب الجلوس بوضعية القرفصاء أو الجلوس على الأرض واستخدم مرحاضًا مرتفعًا لتقليل الإجهاد على الطرف المصاب.
- حافظ على بيئة المنزل خالية من عوامل الخطورة كالعوائق أو الانزلاقات، مع الحرص على الإضاءة الجيدة وسهولة الوصول للأغراض الأساسية.
- استخدم أدوات المشي المساندة بناءً على توصية مقدم الرعاية الصحية.
- لا تجلس على مقاعد منخفضة أو تنحني بحيث يصبح الورك أدنى من الركبتين؛ احرص دومًا على أن يكون الورك أعلى من مستوى الركبة.
- افحص قدراتك البصرية والسمعية بشكل منتظم.
- مارس التمارين تدريجيًا حسب القدرة وتوصيات المتخصصين.
- استخدم السجاد غير القابل للانزلاق وارتدِ حذاءً مناسبًا ومريحًا لتقليل أخطار التعثر والسقوط.
- اتبع نظامًا غذائيًا متوازنًا واشرب كمية كافية من السوائل، وحرصًا على تعزيز التعافي تناول البروتين ومكملات الكالسيوم وفيتامين د وفق التوصية الطبية.
- التزم بتعليمات الأدوية الموصوفة وخطة علاج هشاشة العظام إن وجدت.
- انهض من الكرسي كل نصف ساعة وتجنب تشابك الساقين لفترات طويلة.
- امتنع عن التواء الطرف الذي أجريت عليه الجراحة أو النوم عليه حتى اكتمال الشفاء.

.

لمزيد من الاستفسارات أو النصائح الطبية يرجى التواصل مع:

المديرية العامة لمستشفى خولة – قسم العظام

هاتف: 22505059–22501470–22501423–22501457–22501411