Clinical Practice Guideline for Patients Requiring Total Hip Replacement

Inclusions
Patients undergoing elective total hip replacement

Exclusions
Patients with active local or systemic infection or medical conditions that substantially increase the risk of severe perioperative complications or death.

Indications
Primary total hip replacement (THR) is most commonly used for hip joint failure caused by osteoarthritis; other indications include, but are not limited to, rheumatoid arthritis, avascular necrosis, traumatic arthritis, certain hip fractures, benign and malignant bone tumors, the arthritis associated with Paget's disease, ankylosing spondylitis, and juvenile rheumatoid arthritis. The aims of THR are relief of pain and improvement in function.

Issues
- Pre-Surgical Patient Education
- Perioperative Blood Loss
- Deep Venous Thrombosis (DVT) and Pulmonary Embolism (PE)
- Infection
- Dislocation
- Patient Anxiety
- Discharge Planning
- Rehabilitation

Goal
- To improve patient outcomes following THR surgery while making efficient use of health care resources.

Recommendations

Perioperative Complications:

Blood Loss
- Autologous blood donation 3 weeks prior to surgery

Postoperative Complications:

Deep Venous Thrombosis (DVT), Pulmonary Embolism (PE)
- Full length TED stockings
- Either warfarin or low molecular weight heparins beginning 12 hours pre- or postoperatively with a duration of 7 to 10 days
- Foot and calf pumping

Infection
- Use of a cephalosporin for antibiotic prophylaxis, started preoperatively and continued for a 24 hour period

Patient Anxiety/Dislocation
- Inclusion of consistent patient education both preoperatively and postoperatively, by all members of the health care team
- Patient education booklet that the patient can refer to before and after surgery, and following hospital discharge

Mobilization
- Ambulation beginning postoperative Day One, with routine physiotherapy protocol in hospital
- A routine physiotherapy protocol using outcome goals for both home care and outpatient physiotherapy for patients following discharge from hospital
Discharge Planning
- Early, consistent information involving the entire health care team
- Goal to discharge the patient home 5 days postoperatively

Outcome Measures
- Use of the Functional Assessment Tool as an outcome to measure patient functionality and quality of life

Background

Introduction
More than 120,000 artificial hip joints are being implanted annually in the United States. Successful replacement of deteriorated, arthritic, and severely injured hips has contributed to enhanced mobility and comfortable, independent living for many people who would otherwise be substantially disabled. New technology involving prosthetic devices for replacement of the hip, along with advances in surgical techniques, has diminished the risks associated with the operation and improved the immediate and long-term outcome of hip replacement surgery.

Questions remain, however, concerning which prosthetic designs and materials are most effective for specific groups of patients and which surgical techniques and rehabilitation approaches yield the best long-term outcomes. Issues also exist regarding the best indications and approaches for revision surgery.

Indications
Primary THR is most commonly used for hip joint failure caused by osteoarthritis; other indications include, but are not limited to, rheumatoid arthritis, avascular necrosis, traumatic arthritis, certain hip fractures, benign and malignant bone tumors, the arthritis associated with Paget's disease, ankylosing spondylitis, and juvenile rheumatoid arthritis. The aims of THR are relief of pain and improvement in function. Candidates for elective THR should have radiographic evidence of joint damage and moderate to severe persistent pain or disability, or both, that is not substantially relieved by an extended course of nonsurgical management. These measures usually include trials of analgesic and nonsteroidal anti-inflammatory drugs (NSAIDs), physical therapy, the use of walking aids, and reduction in physical activities that provoke discomfort. In certain conditions such as rheumatoid arthritis and Paget's disease, additional disease-specific therapies may be appropriate. The patient's goals and expectations should be ascertained prior to THR to determine whether they are realistic and attainable by the recommended therapeutic approach. Any discrepancies between the patient's expectations and the likely outcome should be discussed in detail with the patient and family members before surgery.

In the past, patients between 60 and 75 years of age were considered to be among the best candidates for THR. Over the last decade, however, the age range has been broadened to include more elderly patients, many of whom have a higher level of comorbidities, as well as younger patients, whose implants may be exposed to greater mechanical stresses over an extended time course. In patients less than 55 years of age, alternative surgical procedures such as fusion and osteotomy deserve consideration. However, there are no data showing that the outcomes of these procedures are as good or better than those from THR when performed for similar indications. Advanced age alone is not a contraindication for THR; poor outcomes appear to be related to comorbidities rather than to age.

There are few contraindications to THR other than active local or systemic infection and other medical conditions that substantially increase the risk of serious perioperative complications or death. Obesity has been considered a relative contraindication because of a reported higher mechanical failure rate in heavier patients; however, the prospect of substantial long-term reduction in pain and
disability for heavier patients appears to be
similar to that for the population in general.

Thus, although the clinical conditions and
circumstances leading to THR are broadly
defined, several issues regarding indications
remained unresolved. For example, data are
insufficient on the associations between
potential risk factors (e.g., age, weight,
smoking, medications) and outcomes to guide
treatment of the individual patient. Moreover,
indications are not clear for use of the various
surgical approaches and types of prostheses
in individual patients. Finally, standardized
instruments to measure levels of pain,
physical disability, and quality of life as
perceived by the patient need to be used to
guide clinical decision-making and choice of
surgery.

Perioperative Complications

Blood Loss

Total hip replacement surgery is associated
with significant blood loss. The proportion of
hip replacement surgeries requiring blood
transfusions has been seen to be over 50%2.
The decision to transfuse patients undergoing
surgery is generally made by agreement of
the anesthesiologist and surgeon, but there
are no clear criteria for making this decision.
We do know that patients with a low
preoperative hemoglobin receive more
transfusions than patients with higher
hemoglobin levels2.

Multiple methods to decrease the incidence of
allogenic blood transfusions are available,
including predonation of blood (autologous
blood donation), hemodilution, perioperative
blood salvage, and preoperative
administration of erythropoietin3. Preoperative
erythropoietin therapy has been shown to be
effective in reducing the incidence of blood
transfusions in patients with hemoglobin levels
between 10-13 mg/dL4. Erythropoietin may be
as effective as autologous blood donation in
reducing the need for allogenic transfusions,
and can increase the number of rheumatoid
arthritis patients who can make autologous
donations4. The antifibrinolytic agent
tranexamic acid may have a role in reducing
blood loss5,6.

Postoperative Complications

Deep Venous Thrombosis and
Pulmonary Embolism

Pulmonary embolism (PE) is a major concern
with THR, resulting primarily from
development of deep venous thrombosis
(DVT) in the lower extremities7. Fatal PE
occurs in up to 5% of patients who have
undergone hip replacement surgery7. There
are various treatments that can be used to try
and reduce the risk of DVT and PE.

The National Guideline Clearinghouse (NGC)
guideline for DVT7 recommends that either
subcutaneous low molecular weight heparin
(started either 12 hours before surgery, 12-24
hours after surgery, or 4-6 hours after surgery
at half the usual high-risk dose and then
continuing with usual high risk dose the
following day) or adjusted dose warfarin (ratio
target 2.5, range 2.0 to 3.0, started
preoperatively or immediately after surgery).
One review8 concluded that low molecular
weight heparins and warfarin are more
effective than other agents, but heparins are
associated with a higher rate of bleeding
complications, so warfarin is recommended as
the most effective and least risky. However,
warfarin requires intermittent blood work
throughout treatment, and so compliance and
quality of life become an issue. Adjusted dose
heparin, started preoperatively, is an
acceptable but more complex alternative. The
optimal duration of anti-coagulant prophylaxis
is 7 to 10 days9,7. For high-risk patients only,
the NGC guideline on DVT prophylaxis7
recommends extending the duration of
prophylaxis beyond the 7 to 10 day duration.

The NGC7 also recommends that graduated
compression stockings or intermittent
pneumatic compression may also provide
additional efficacy against DVT. Other
agents, such as low dose unfractionated
heparin, aspirin, dextran, intermittent
pneumatic compression alone, are all less effective and not recommended.

Foot and calf pumping devices appear to prevent DVT, and may protect against PE, and reduce mortality, but compliance remains a problem in most cases.\(^8\)

**Infection**

Wound infections are among the most common nosocomial infections among hospitalized surgical patients and are the second or third most common nosocomial infections among all hospitalized patients.\(^10\) Antimicrobial prophylaxis has shown to be effective in the prevention of infection.\(^10\) A Cochrane Review\(^11\) found no convincing evidence that any particular cephalosporin is more effective than another. It also found no evidence that extending the antibiotic regimen beyond 24 hours postoperatively reduces the number of infections. A single dose or short-term administration is not only as effective as longer-term, but will lower overall costs and reduce the risk of toxicity and development of bacterial resistance.\(^12,13,14\)

**Patient Anxiety**

Major surgical procedures such as total hip replacements affect the patient both physically and psychologically. If a patient is unduly anxious, recovery may be affected, prolonging the length of hospital stay, the cost of care and the patient’s well being. Preoperative education reduces patient anxiety, reducing stress and enhancing patient outcomes, and ultimately reducing the patient’s length of stay in hospital.\(^15\) A Cochrane review is currently being done on this topic and is expected in early 2004.

**Dislocation**

Dislocation of the hip after a THR can be up to 2.4%, mostly occurring in the first year.\(^8\) Prevention of dislocation comes in two forms. First, it has been shown that dislocation occurs less often with an anterolateral surgical approach than a posterior approach.\(^8\) Second, patient education focusing on hip precautions and an exercise regime can help to reduce dislocations. It is generally recommended that education efforts be concentrated in these areas, both pre and postoperatively.\(^15\)

**Mobility**

Early mobility has been shown to decrease risk for DVT, pressure sores, and respiratory complications in patients undergoing orthopedic surgery.\(^7,16\) Patient outcomes are improved, patient satisfaction is increased, and length of stay in hospital is shorter when a patient is mobilized early and follows a standardized physiotherapy protocol.\(^17\)

Continuity of patient care throughout the recovery process after a THR is important. A protocol for home care and outpatient physiotherapy improves patient outcome and reduces the length of hospital stays.\(^18\)

**Discharge Planning**

Many studies have described the importance of early development of a formalized discharge plan and of effective intraorganizational and interorganizational communication of this plan. With a discharge planning protocol in place that all members of the health care team communicate, patients have shorter hospital stays, fewer readmissions, and higher rates of needed post-discharge services.\(^19,20\)

It is imperative that the patient and caregiver be involved in the discharge planning and decision-making. With the increasing number of elderly patients and elderly caregivers for these patients, planning for discharge becomes more complicated and crucial to the patient achieving desired outcomes.\(^19\) All health professionals have a responsibility to ensure that there is a plan for discharge, and that this is well communicated to both
the patient and the discharge destination, whether it be care closer to home in a community hospital, retirement facility or long term care centre, rehabilitation setting, or home with home care services\textsuperscript{19, 20}.

**Outcome Measurement**

It is important for the health care team to be able to measure patient outcomes, based on the patient’s functional goals and quality of life. The Institute for Clinical Evaluative Sciences (ICES) has published a Functional Assessment Tool, a valid and reliable measure for patient progress\textsuperscript{8}.
References

5. Kazuhiro et al. Reduction of blood loss using tranexamic acid in total knee and hip arthroplasties. Archives of Orthopedic Trauma Surgery (2000); 120:518-520
12. The Medical Letter. Antimicrobial prophylaxis in Surgery (1999); 41(1060):75-80
17. March M et al. How best to fix a broken hip. MJA (1999); 170: 489-494