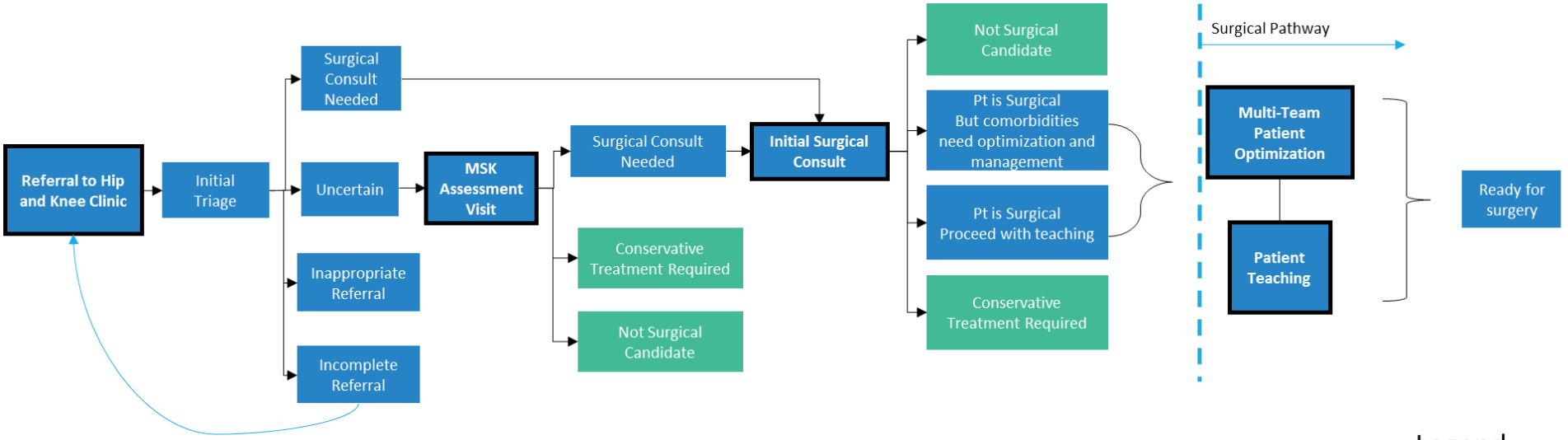
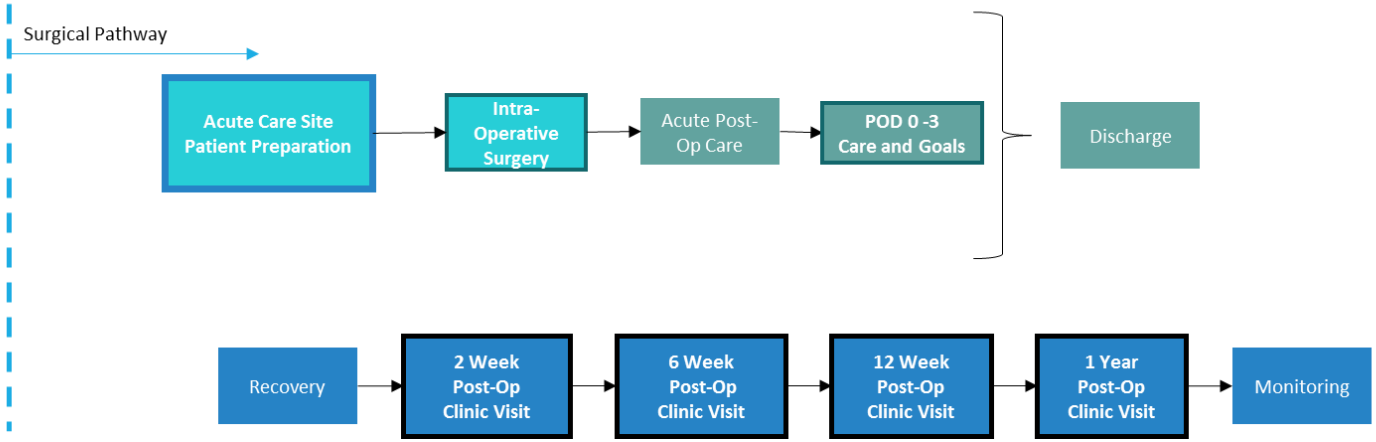
# Hip and Knee Surgical Care Path
# Release Date: 2021

## Abbreviations

| Term | Meaning | Term | Meaning | Term | Meaning |
|---|---|---|---|---|---|
| ADL | Activities of Daily Living | NSAID | Non-steroid anti-inflammatory | | |
| AHS | Alberta Health Services | OR | Operative Room | | |
| AP | Anterior-posterior | OSA | Obstructive Sleep Apnea | | |
| ASA | American Society of Anesthesiologists | OT | Occupational Therapist | | |
| Bid | *Bis in die* – twice daily | PCN | Primary Care Network | | |
| BMI | Body Mass Index | PCP | Primary Care Physician | | |
| BPMH | Best Possible Medication History | prn | *Pro re nata* – take as needed | | |
| CBC | Complete Blood Count | PO | *Per os* – by mouth | | |
| CHG | Chlorhexidine Gluconate | POD | Post operative days | | |
| CM | Case Manager | PONV | Post operative nausea and vomiting | | |
| DAT | Diet as Tolerated | PT | Physiotherapist | | |
| DB & C | Deep breath and cough | Pt | Patient | | |
| D/C | Discharge | q_h | *Quaque hora* - every _ hours | | |
| DOAC | Direct Oral Anticoagulants | RN | Registered Nurse | | |
| DOS | Duration of stay: 24 hours = $^{1}$ day; defined as from when patient checks in for surgery to when (s)he leaves the hospital | ROM | Range of Motion | | |
| | | RR | Respiratory Rate | | |
| DVT | Deep Vein Thrombosis | SBP | Systolic Blood Pressure | | |
| ECG | Electrocardiogram | THA | Total Hip Arthroplasty | | |
| EQ5D | euroQol – 5 dimension – 5 levels | TKA | Total Knee Arthroplasty | | |
| F/A | Foot and Ankle | TXA | Tranexamic Acid | | |
| GI | Gastro-intestinal | QID | *Quater in Die* – four times per day | | |
| GP | General Practitioner | WBC | White Blood Cells | | |
| Hgb | Hemoglobin | Wt | Weight | | |
| IM | Internal Medicine | WOMAC | Western Ontario and McMaster Universities Osteoarthritis Index | | |
| INR | International Normalized Ratio | | | | |
| IPA | Isopropyl alcohol | | | | |
| IV | Intravenous | | | | |
| LMWH | Low Molecular Weight Heparin | | | | |
| MSK | Musculoskeletal Specialist | | | | |

# The Hip and Knee Arthroplasty Care Path

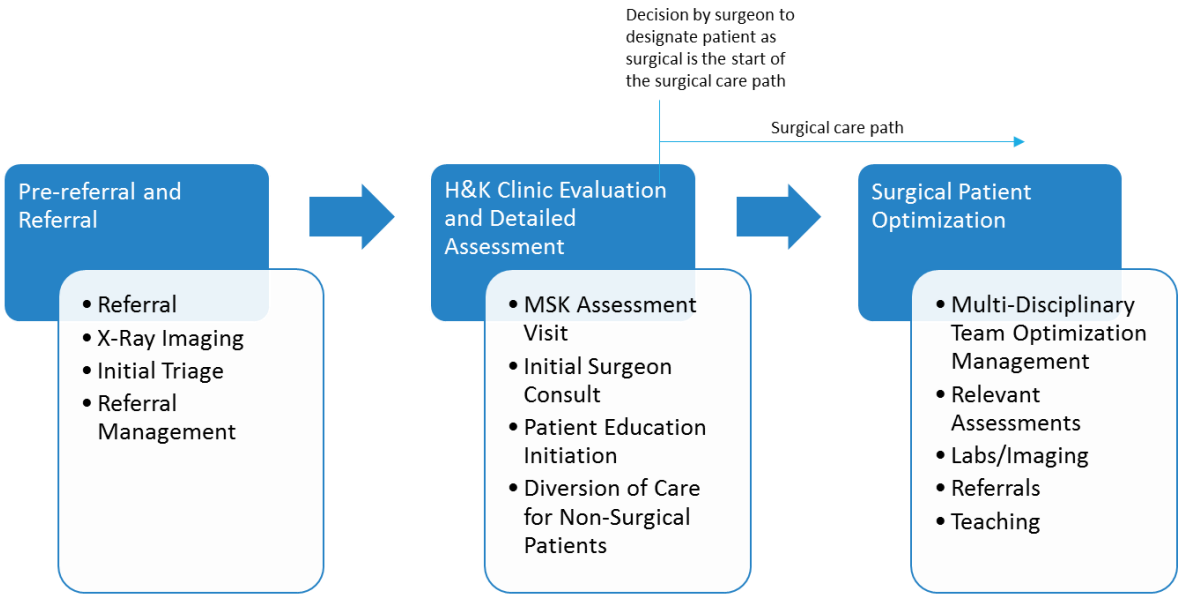



## Legend

- Clinic delivers care
- Non-Surgical – refer to Conservative Care Path when available
- Hospital – Admission delivers the care
- Hospital – OR delivers the care
- Hospital – In-patient delivers the care

# Hip and Knee Care Path –
# Referral to Assessment to Surgical/Medical/Functional Optimization



| Guidelines | Suggested Tools |
|---|---|
| ☐ **For Authorized Practitioner:**<br>• All referrals sent to designated Hip and Knee Replacement Clinic<br>• Authorized practitioner submits a standardized data set with completed referral packages including diagnostic imaging and applicable consult reports<br>• Referring authorized practitioner designates preferred Surgeon or next available Surgeon<br>• Referring authorized practitioner will be contacted if preferred Surgeon is not available within appropriate wait standards.<br>☐ **For Primary Assessments:**<br>• All referrals triaged in a Hip and Knee Replacement Clinic<br>• All referrals receipt acknowledged within 7 working days, and screened for appropriateness within 14 days[1]<br>• Triaging:<br>1. Referral is inappropriate: send notice of denial<br>2. Referral is incomplete: send notice of pending<br>3. Referral is appropriate:<br>a. Pts that require an MSK assessment to determine optimal treatment, are booked for an MSK Assessment Visit (see below)<br>b. Otherwise Pt is booked for Initial Surgical Consult (see below)<br>Note: Appropriate referrals *should* be booked to receive a clinic evaluation within 40 working days[2]<br>Note: Notice of acceptance, pending, or denied sent to referring authorized practitioner, as defined<br>• If accepted, Pt instructions communicated to each Pt<br>▪ Pt advised to select "Buddy"/Family member to attend clinic visits<br>☐ **For Revision:**<br>• Monitored Pt booked by Surgeon who did primary; or<br>• Monitored Pt referred to revision specialist by Surgeon who did primary; or<br>• Non-monitored Pt's authorized practitioner completes referral<br>• Pt advised to select "Buddy"/Family member to attend clinic visits | Provincial Referral Form<br>**Required for Referral Tests/Diagnostics**<br>☐ **Knee:**<br>• AP WB<br>• Lateral<br>• Skyline optional<br>☐ **Hip:**<br>• AP pelvis centered at pubis<br>• AP and lateral of proximal half of affected femur<br>☐ **For Revision:**<br>• Use monitored images if completed<br>• If monitoring images have not been done, then complete full set as above shoot through lateral of hip if requested |

## Hip and Knee Clinic Evaluation and Detailed Assessment

| MSK Assessment Visit | Suggested Tools |
|---|---|
| ☐ **Preparation:**<br>• Pt completes self assessment<br>• Outcome measurement tool completed on all Pts<br>☐ **During MSK Assessment:**<br>• Pt validate referral package material<br>• MSK specialist/Surgeon decides whether a surgical assessment is required or the Pt is non-surgical, see criteria (right)<br>1. Pt has maximized conservative treatment and a surgical assessment is required<br>2. Pt has not maximized conservative treatment – conservative treatments can still be exploited to improve quality of life and function (Pt. is non-surgical, see below)<br>3. Pt is not an appropriate candidate for an elective surgery (see criteria, right). Conservative treatments can be explored (Pt. is non-surgical, see below)<br>• If applicable, subsequent appointments are booked (see below)<br>☐ **If 2nd Opinion is Required**:<br>• 2nd opinion can be requested by referring authorized practitioner or Pt.<br>• Referring authorized practitioner to submit new Referral and indicate 2nd opinion<br>• Pts to call clinic directly and request 2nd opinion | Hip and Knee Outcomes Tool (Combined WOMAC and EQ5D-5L)<br>**Criteria for Non-Surgical Pt**<br>☐ Cognitive/neurologic impairment (Surgeon discretion)<br>☐ Orthopaedic challenges such as history of infection, or technical infeasible, or the joint cannot be reconstructed<br>☐ Pt refuses surgery<br>☐ Not willing to be compliant with the care path<br>☐ Extreme medical risk |

## Non-Surgical Patient

| Non-Surgical Care |
|---|
| ☐ **If Pt is Designated as Non-Surgical:**<br>• MSK specialist/RN or Surgeon/RN/CM completes either Surgical Optimization Pt Plan or Non-Surgical Pt Plan<br>• Some non-surgical Pts return to clinic for non-surgical treatment. Non-surgical Pts who return for treatment book with clinic representative<br>• Decision and accompanying documentation communicated back to referring authorized practitioner<br>• Follow 2nd Opinion steps (above) if required |
| **Suggested Tools** |
| ➢ **Please also refer to OA Conservative Management Care Map – To Be Developed by Hip and Knee Osteoarthritis – Conservative Working Group** |

Surgical Assessment

## Initial Surgical Consult

☐ **Preparation:**

- All surgical Pt completes Hip/Knee Patient Reported Outcome and Experience Measures
- All surgical Pts assigned to a Hip and Knee Replacement Surgeon and CM based on next available or requested Surgeon (if within standard waits)

☐ **During Hip and Knee Replacement Clinic Team Evaluation:**

- Surgeon and CM validate/complete referral package material (history and demographics)
- X-rays ordered for views missing from referral stage
- Surgeon assess risk factors and determines feasibility of surgery:
  1. Pt has too many risk factors and Surgeon is unwilling to proceed (Pt is non-surgical, see above)
  2. Pt still has conservative measures they can attempt (Pt is non-surgical, see above)
  3. Pt is suitable for surgery, but existing risk factors will require optimization and management (follow Surgical Pt Optimization, below)
  4. Pt is suitable for surgery and is ready for teaching (follow Surgical Pt Optimization, below)
- Start surgical Pt agreement[3]
- Order minor-treatments, pre-op PT, clinic OT consult, nutrition consult, home visit and referrals for medical clearance and peri-operative blood consultation (see Surgical Pt Optimization, below, for criteria)
- Surgical Pts advised dental clearance is required, at Surgeon discretion
- CM reviews consult referrals and lab/imaging requisitions with Pt and advises Pt of timelines
  1. Copy of plan given to Pt
  2. Copy of plan sent to referring authorized practitioner and PCP, if different, within 5 working days of Pt's consult

## Additional Tests and Diagnostic Imaging

☐ **For Knees**

- Three foot standing of limb at Surgeon's discretion

☐ **For Hips**

- Additional film as required at Surgeon's discretion

Note: Pre-operative x-rays with templating spheres done at the discretion of the Surgeon

## Teaching/Discharge

☐ Surgical Pts are given Pt education package (guide book and resources) to review at home

☐ At clinic's discretion, surgical Pts are directed:

- to local pharmacy for full medication review, and
- for initiation of tobacco cessation program, if applicable.

Note: Pt to bring all documentation from complementary programs to next clinic appointment.

☐ Surgical Pts are encouraged to visit their PCP to develop their goals of care and personal directives

## Suggested Tools

Hip and Knee Outcomes Tool (Combined WOMAC and EQ5D-5L)

Surgical Patient Agreement[3]

Buddy Agreement

Canadian Nutrition Screening Tool

## Patient/Family/Buddy Responsibility

☐ Select "Buddy" to attend all clinic visits, especially teaching session

☐ Buddy to sign agreement of duties throughout surgery and discharge, and a Plan B if not available on surgery dates

☐ Buddy to notify Hip and Knee Replacement CM if Pt's medical status changes

## Optimization Management

- ☐ Pt will not proceed to surgery until all conditions met or waived
- ☐ Medical assessment completed by Hip and Knee Replacement Clinic designated physician unless referring authorized practitioner advises clinic (s)he will be responsible (see Relevant Assessments below)
- ☐ Medical clearance to indicate conditions to be treated, recommended treatment, and ASA score (see right)
- ☐ Surgical Pts assessed by consultants at Surgeon's discretion, or designate, or as determined by screening criteria for clearance (see Consults section, below, for criteria)
  - At minimum, review criteria in IM and Anaesthesia categories
  - Consider specialized wellness programs (Wt loss, tobacco cessation, community exercise programs) as required
- ☐ After consultation with specialists for medical clearance and optimization the Pt will be sent back to the referring authorized practitioner/Hip and Knee Replacement Clinic who indicated responsibility for medical clearance and oversight of optimization
- ☐ If referring authorized practitioner responsible, Hip and Knee Replacement Clinic CM to monitor progress

## ASA Classification

| Status | Description |
|---|---|
| **1** | Healthy Pt |
| **2** | Mild systemic disease |
| **3** | Severe systemic disease (not incapacitating) |
| **4** | Severe systemic disease that is a constant threat to life |
| **5** | Moribund, not expected to live 24 hours |
| **E** | Emergency Procedure |

## Suggested Tools

Surgical Patient Agreement

## Optimization Wrap Up, Hand Over to Surgical Site and Discharge Planning

- ☐ Pt cleared for surgery minimum 2 weeks prior to surgery date
- ☐ Pts requiring an extensive discharge plan will return for an extra visit to Hip and Knee Replacement Clinic to discuss plan
- ☐ CM to complete surgical Pt agreement once all consults, including medical clearance, have been completed and report(s) forwarded
  - All surgical Pts to review their agreement with their CM and sign-off
  - CM must also sign-off
  - Pt variances from agreement/care path (e.g. DOS) communicated by CM to acute care sites
- ☐ OR booking package completed, as required, and forwarded to appropriate AHS/Covenant Health sites upon surgical agreement completion (Follow on to Same Day Admit and Intra-Operative Surgery Sections, see below).

## Relevant Assessments

### Pulmonary Embolism

☐ Assess pre-operatively for elevated risk (greater than standard risk). The following Pts are examples of those considered to be at elevated risk:

- Previous documented pulmonary embolism
- Previous history of thromboembolism
- Previous history of Hypercoagulable states such as polycythemia
- Spinal cord injury Pts
- Previous history of cancer

### OSA

☐ Assess pre-operatively for OSA:

- Conduct Stop Bang test

### Major Bleeding

☐ Assess pre-operatively for elevated risk (greater than standard risk). Pts with the following conditions are examples of those considered to be at elevated risk:

- History of a bleeding disorder
- History of recent GI bleed
- History of recent hemorrhagic stroke

### PONV

☐ Assess pre-operatively for baseline predictive risk factors using the Apfel Simplified Risk Score:

- Female Gender
- Non-smoker
- History of PONV or motion sickness
- Intra-operative or post-operative use of opioids

### Anemia Management

☐ Assess Pts pre-operatively for increased risk of low red blood cell mass using the AHS Preoperative Anemia Management & Hemoglobin Optimization Tool (2016).

**At-Risk Patient Populations:** Hgb <130g/L (male or female), weight <65kg, female gender, complex or revision surgery, renal disease, anti- platelet and/or anti-coagulant therapy, hematologic conditions (i.e.: Thalassemia), 'No Blood'/transfusion-refusal

**Ideal Timeline for Assessment:** Ideally at surgical INTAKE, at time of acceptance for surgery; **at least 30 days preop**

**Hgb less than 100g/L**

***Consider* DELAY of elective procedure.** Notify appropriate physician for discussion & investigation

**Hgb 100-130g/L**

**Investigate Cause:** blood loss (e.g.: GI, menstrual, epistaxis), anti- coagulant status, renal/hepatic failure, poor nutritional status, etc. Refer to appropriate physician for investigation/treatment of underlying cause, if able.
**Testing:** CBC, Retic Count, Ferritin*, Creatinine, Iron Panel (Serum Iron/TIBC) *Consider false elevation with inflammation

**Hgb greater than 130g/L**

**Consider needs of elective procedure.** Consider further Hgb optimization & intra-op blood-sparing modalities

## Labs/Imaging

**Standards:**

☐ All Pts tested per lab and ECG requirements (see table below for guidelines)

☐ Pt-specific testing to monitor and achieve medical threshold defined in surgical Pt agreement; e.g. chest x-ray; INR for Pts on warfarin

☐ Laboratory investigations should be ordered only when indicated by the Pt's medical status, drug therapy, or the nature of the proposed procedure

☐ ECGs are valid for three months, if available to anaesthesiologist, and if there have been no changes in symptoms in that time

☐ Lab work is valid for 14 weeks

☐ C-Spines are valid for one year

☐ Chest x-rays are valid for one year

**Table: Preoperative Laboratory Testing Guidelines for Common Comorbidities**

Note: This is minimum suggested pre-operative screening, tailor to the Pt's requirements for medical clearance

- ☐ Pre-operative **HbA1c, ferritin, and/or albumin** testing at Surgeon's discretion
- ☐ **ß-HCG** can be offered to premenopausal women who may be pregnant. Surgery need not be cancelled if the Pt declines
- ☐ **Type and Screen** not routinely required. May be ordered, at Surgeon's discretion, for revisions or bilaterals.

| Condition | CBC | Electrolytes | Creatinine eGFR | INR ±PTT | A1C | ECG | C-Spines | Chest X-ray |
|---|---|---|---|---|---|---|---|---|
| ≥60 years old | X | | X | | | X | | |
| Revision Pts | X | | | | | | | |
| Inflammatory disease | X | | | | | | | |
| Known or suspected anemia, malnutrition, bleeding disorder, or bone marrow suppression | X | | | | | | | |
| Cardiovascular Disease (IHD CHF, Valvular HD, Pacemaker) | X | | X | | | X | | X |
| Hypertension | | X | X | | | X | | |
| Chronic Lung Disease (COPD, Pulmonary Fibrosis), Smokers >20/day | X | | | | | | | X |
| Diabetes | | | X | | X | X | | |
| Hepatic Disease (i.e. sclerosis) | X | | | X | | | | |
| Renal Disease, Adrenocortical disease | X | X | X | | | | | |
| Therapy with diuretics, oral corticosteroids, lithium, DDAVP, or digoxin | | X | X | | X | | | |
| Pt taking Anticoagulants | X | | | X ‡ | | | | |
| Malignancy | X | | | | | | | |
| Radiation or Chemotherapy in last 12 months | X | | | | | | | |
| Rheumatoid Arthritis | | | | | | | X | |
| Previous spinal instrumentation or fusion | | | | | | | | |
| Immigrant without chest x-ray in last 12 months | | | | | | | | X |

‡ Coumadin = INR; No INR if therapy with warfarin stopped six days pre-operatively Unfractionated heparin = PTT
LMWH = No Action Antiplatelet Agents = No Action

## Consults for Consideration

| Type of Consult | Criteria for Referral |
|---|---|
| **Internal Medicine** | ☐ Cardiovascular disease:<br>• IHD with angina with mild exercise, or worsening angina<br>• MI in last 12 months<br>• Symptomatic valvular heart disease<br>• CHF in last 12 months<br>• Uncontrolled hypertension<br>☐ Diabetic<br>☐ Neuromuscular Disease<br>☐ Pulmonary Disease:<br>• Shortness of breath with mild exercise.<br>• OSA<br>☐ Restrictive lung disease<br>☐ Hematology:<br>• Anticoagulant for any reason,<br>• Anemia,<br>☐ Morbid obesity (BMI ≥40),<br>☐ Pts currently being managed by an internist or cardiologist with an ASA 3 or greater score |
| **Anaesthesia**<br>(Also consider IM criteria for Anaesthesia referral) | ☐ Known or suspected allergy to anesthetic drugs.<br>☐ Pt or family history of Malignant Hyperthermia<br>☐ Significant complications with previous anesthetics (including awareness).<br>☐ Jehovah's Witness – for hip arthroplasty<br>☐ History of Chronic Pain or long term (>6month) Opioid Usage<br>☐ Pts currently being managed by an internist or cardiologist with an ASA 3 or greater score<br>☐ Pt's request<br>☐ Known or suspected difficult airway<br>☐ Bleeding diathesis<br>☐ Morbid obesity (BMI ≥ 40)<br>Note: AP lateral spine x-ray to be ordered and provided to anaesthetist for Pts with lumbar spine instrumentation or fusion<br>Flexion extension cervical spine views to be ordered and provided to anaesthetist for Pts with rheumatoid arthritis |
| **Clinic OT Visit** | ☐ Pts with home issues and home visit not possible<br>☐ Out of region or major centre with limited access to OT resources<br>☐ Pt with significant ADL issues<br>☐ Require referral to AHS equipment program |
| **Home Assessment/ Homecare Referral** | ☐ Pt having difficulty with self care, medication management or independent functioning pre-operatively<br>☐ Pt requiring extra (more permanent) equipment in home<br>☐ Pt not reliable historian<br>☐ Safety/fall risk |
| **Nutritional Consult** | ☐ Pt with BMI greater than 30 or less than 18<br>☐ Diabetic or hypertensive Pts with nutritional issues |

| Type of Consult | Criteria for Referral |
|---|---|
| | ☐ Anemic Pts<br>☐ Pts with Chronic Kidney Disease |
| **<u>Group</u> Pre-Operative Physiotherapy Treatments** | ☐ Frail elderly or debilitated Pt with pain and/or weakness limiting function at home pre-operatively<br>☐ Deconditioned Pt with poor upper extremity strength and/or ROM<br>☐ Deconditioned Pt with poor cardiovascular fitness and minimal exercise tolerance<br>☐ Pt with multiple joint involvement that limits function pre-operatively<br>☐ Pt with decreased balance and poor/unsafe ambulation pre-operatively<br>☐ Pt with significant contractures or quad lag pre-operatively |
| **<u>Individual</u> Pre-Operative Physiotherapy Treatments** | ☐ Frail elderly or debilitated Pt with pain/and or weakness limiting function at home pre-operatively<br>☐ Pt has communication issues<br>☐ Pt has complex functional or medical issues<br>☐ Difficult or disruptive Pt<br>☐ Out of region or major centre with limited access to rehabbing treatment |
| **Social Work** | ☐ Financial concerns<br>☐ Employment concerns<br>☐ Limited support system<br>☐ Difficult family dynamics<br>☐ Transportation issues<br>☐ Accommodation issues<br>☐ Addition issues<br>☐ Alleged abuse<br>☐ Child care issues<br>☐ Cultural/Language barriers<br>☐ Mental health or behavioral issues<br>☐ Concurrent crisis<br>☐ Legal issues |

## Teaching

☐ Teaching is an imperative part of the entire Pt experience at the Hip and Knee Replacement Clinic

### The Education Session

☐ **Format:**

- Site specific format to be determined at team's discretion

  Note: Provincial video is available

- Education session completed by CM and others e.g. OT, PT

☐ **Suggested Teaching Aids:**

- Surgery Pt Guidebook explaining aspects of intervention from beginning to end plus tools and instructions
- Equipment list for Pts to organize for discharge (friend or family, vendors, RX or STELP, Health Unit)
- Available resources for Pts (Home Care, Meals on Wheels, Life Line, etc.); Education Video/DVD
- Hip kit (reacher, long handled shoe horn/ stocking aid/ long handled bath sponge)
- Theraband (exercise elastic), exercise instructions and booklet for home use for prehab
- Classroom with comfortable (tall) chairs and tables for Pt to sit and write, bed to demonstrate transfers
- VCR, DVD and TV
- Teaching crutches, walker, bathroom and dressing aids
- Telehealth

☐ **Additional Items to Teach/Enforce**:

- Daily bath or shower with 4% chlorhexidine sponges for 3 days leading up to surgery
- Topical application of 2% mupirocin* ointment twice per day to the nares for 5 days leading up to surgery[4,5]
- No lotion or cream to be used on the surgical site 5 days prior to surgery
- No hair removal to be done 2 weeks prior to admission[6]

### Equipment and Supplies

☐ Home aids (dressing /bathing aids and equipment)

☐ Pt skin wash package including 4% chlorhexidine sponges

☐ 2% mupirocin ointment prescription

☐ Walking aids

### Activity / Mobility Instructions

☐ Home pre-operative strengthening program/exercises for all surgical Pts

☐ Use of walking aids as required

### Patient/Family/Buddy Responsibility

☐ Buddy to attend

- Surgical agreement discussion and signing
- Pre-op teaching sessions, including education session and other appointments as necessary

☐ Comply with pre-surgery optimization programs

☐ Prepare home and organize required equipment prior to surgical date

☐ Notify Hip and Knee Replacement CM if medical status changes

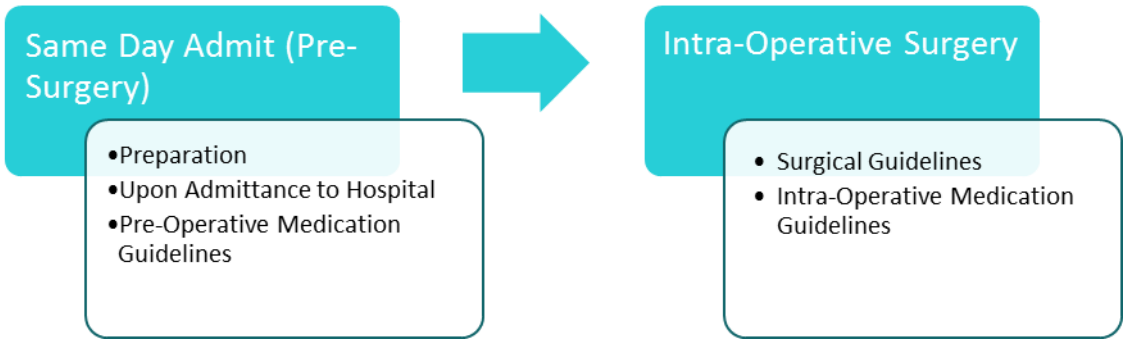
### Surgical Agreement Completion

☐ All surgical Pts to review their agreement with their CM.

☐ CM must arrange to have all appropriate sign-offs completed before handoff to surgical site.

*This is an off-label use of this drug product; studies have associated it with very minimal risk to patient health and safety.[4,5]

# Hip and Knee Care Path –
# Same Day Admit to Intra-Operative Surgery



## Same Day Admit (Pre-Surgery)

### Preparation

| Patient/Family/Buddy Responsibility | Nutrition |
|---|---|
| ☐ Bring all current medications<br>☐ Bring labeled reacher, dressing aids, exercise log book, crutches and/or walker (Pt-specific aids)<br>☐ Buddy to accompany Pt to the hospital/site at scheduled time<br>☐ No hair removal to be done prior to admission[6]<br>☐ Chlorhexidine skin washes night prior to or morning of surgery (sponge provided to Pt in Hip and Knee Replacement Clinic)<br>☐ Pts on Warfarin need an INR test the day before surgery, with an INR goal of ≤2 | ☐ Follow Eating and Drinking Before Surgery Instructions:<br>• Eat as usual until 8 hours before surgery<br>• May have a final light, low-fat snack before stopping all solids, 6 hours before surgery<br>• Clear fluids only until 3 hours before surgery<br>• MUST drink 2 cups (500 mL) of clear juice (either cranberry cocktail or apple juice), to be completed 3 hours prior to surgery time (carbohydrate loading).<br>• Nothing by mouth 3 hours before surgery |

| Activity/Mobility |
|---|
| ☐ As directed in Pt Instruction Guide |

### Upon Admittance to Hospital

| Assessment/Monitoring | Communication to Patient |
|---|---|
| ☐ Vital signs ☐ Physical assessment<br>☐ Review of pre-operative medications and complete or update BPMH<br>☐ Utilize Pt warming device (e.g. Bair Hugger) for warming 30 minutes pre-operatively<br>☐ No hair removal is optimal[6]<br>• Perform hair removal as needed–must be done 2 hours prior to entering surgical suite[6]<br>☐ Anesthesia check in with Pt at pre-op area<br>☐ Initiate IV access and fluids<br>☐ Start medication as per Anaesthesiologist or Surgeon's orders. Specific doses depend on Pt's risk (e.g. GI, Cadiac). See medication guidelines below | ☐ Explain the OR process to the Pt<br>**Tests**<br>☐ Diabetics receiving therapy need a glucometer reading on the morning of surgery<br>☐ If not done the day before, Pts on Warfarin need an INR on the morning of surgery, with an INR goal of ≤2 |

<table>
<tr><th>Medication Type</th><th>Instructions</th></tr>
<tr><td>Antiemetics</td><td>☐ Use Apfel Simplified Risk Score to recognize Pts who are more likely to experience PONV<br>☐ Pts identified as high risk for PONV should be treated prophylactically<br>Apfel Simplified Risk Score for PONV in adults
<table>
<tr><th>Risk Factors</th><th>Points</th></tr>
<tr><td>Female Gender</td><td>1</td></tr>
<tr><td>Non-Smoker</td><td>1</td></tr>
<tr><td>History of PONV</td><td>1</td></tr>
<tr><td>Intra-Op/Post-Op Opioids</td><td>1</td></tr>
</table>
☐ If the Apfel score is ≥3 AND Pt has history of PONV not responsive to usual care AND Pt will receive general anesthesia, consider aprepitant.</td></tr>
<tr><td>Antibiotics[7]</td><td>☐ Provide dosing coverage for 24 hours post-operative to all patients</td></tr>
<tr><td>Anti-Reflux</td><td>☐ Specific drug doses to be determined by Anesthesiologist or Surgeon depending on Pt’s risk (e.g. GI, Cardiac)</td></tr>
<tr><td>Analgesics</td><td>☐ Consider use of multi-modal prophylaxis analgesia to control pain early<br>☐ Examples: NSAIDs, acetaminophen, +/- GABA analogs</td></tr>
</table>

## Intra-operative – Surgery

| Guidelines | Intra-operative Tests/Diagnostics |
|---|---|
| ☐ **Start:**<br>• All cases start on time per schedule<br>• Safe Surgery Checklists – all relevant staff to attend surgical-briefing[8]<br>• Site preparation with 2% CHG and 70% IPA (2%CHG-70%IPA) (first choice)[9], if 2% CHG-70%IPA contraindicated, povidone/iodine (second choice) prep, 60% alcohol, and use iodine impregnated adhesive (Ioban) drape<br>• Tourniquets used at Surgeon's discretion<br>• No routine use of Foley catheters[10]<br>• Surgeon signs site of incision and cuts through signature in the OR[11]<br>☐ **During Surgery:**<br>• Nursing assessments and monitoring per AHS/Covenant Health site policy<br>• Pulse lavage to be available for use at Surgeon's discretion -but no antibiotics<br>• Safe Surgery Checklists – all relevant staff to attend surgical-time-out[6]<br>• Infiltration of joint with local anesthetic at Surgeon's discretion<br>• Minimum OR theatre temperature of 20-23°C [6]<br>• Utilize Pt warming device (e.g. Bair Hugger)<br>☐ **Close:**<br>• No Hemovac drains for Hips or Knees[12]<br>• Safe Surgery Checklists – all relevant staff to attend surgical-debriefing[8] | ☐ Dependent upon Pt need and Surgeon's discretion<br>**Performance Standards**<br>☐ Where hospital sites are able: Pt's surgery completed with dedicated team assigned to arthroplasty<br>☐ Benchmark duration for all primary elective procedures, including total hip, hip resurfacing, total knee and partial knee, is 75 minutes from incision to closure<br>☐ OR turnaround from closure on to incision next Pt <45 minutes<br>☐ If a Surgeon cannot perform to the standard of 4 cases in a 7.5-hour day then OR day may be extended by up to 1.5 hours upon authorization by Surgical Chief and AHS/Covenant Health operations |

<table>
<tr><th>Medication Type</th><th>Instructions</th></tr>
<tr><td>Antiemetics</td><td>
☐ Apfel Simplified risk score for PONV in adults

| Risk Factors | Female Gender | Non-Smoker | History of PONV | Post-Op Opioids |
|---|---|---|---|---|
| Points | 1 | 1 | 1 | 1 |

The following suggested selection of antiemetic can be titrated to clinical circumstances.

<table>
<tr><th># Risk Factors</th><th colspan="2">Severity of PONV</th><th>Prophylactic Strategy</th></tr>
<tr><td>0</td><td>10%</td><td>Low</td><td>No Prophylaxis</td></tr>
<tr><td>1</td><td>20%</td><td>Low</td><td>Steroid (dexamethasone 4 mg IV x 1 dose) at induction of anesthesia</td></tr>
<tr><td>2</td><td>40%</td><td>Moderate</td><td>Steroid (dexamethasone 4 mg IV x 1 dose) at induction of anesthesia<br>+/-<br>5-HT3 antagonist (ondansetron 4 mg IV – can be given pre-op & upon closure)</td></tr>
<tr><td>3</td><td>60%</td><td>Severe</td><td>Steroid (dexamethasone 4 mg IV x 1 dose) at induction of anesthesia<br>+/-<br>5-HT3 antagonist (ondansetron 4 mg IV – can be given pre-op & upon closure)<br>+/-<br>NK1 antagonist (aprepitant 80 mg – given in Same Day Admit – see above)</td></tr>
<tr><td>4</td><td>80%</td><td>Very Severe</td><td>Steroid (dexamethasone 4 mg IV x 1 dose) at induction of anesthesia<br>+/-<br>5-HT3 antagonist (ondansetron 4 mg IV – can be given pre-op & upon closure)<br>+/-<br>NK1 antagonist (aprepitant 80 mg – given in Same Day Admit – see above)</td></tr>
</table>
</td></tr>
<tr><td>Analgesics</td><td>
☐ Blocks – target is 90% spinal nerve blocks:

1. Consideration should be given to nerve blocks, particularly for Pts receiving chronic opioid therapy, or who have other complex pain histories:
   - TKA: Femoral nerve block Or Adductor nerve block
2. Consideration should be given to intra-articular injections:
   - TKA: 40 cc bupivacaine 0.25% or ropivacaine 0.5%, ketorolac 30 mg, and normal saline to a total volume of 150 cc
   - THA: 40 cc bupivacaine 0.25% or ropivacaine 0.5%, ketorolac 30 mg, and normal saline to a total volume of 50 cc
     - Bupivacaine max dose should be 2 mg/kg
     - Need to check GFR before giving ketorolac – avoid using if GFR < 40
     - 0.5% ropivacaine should be used if there will be articular cartilage remaining

☐ **For Revision:** Pts may require additional epidural or general due to length of case
</td></tr>
</table>

**Table: TXA Guidelines**[13]

## Communication

- ☐ Use of IV versus topical administration is at the Surgeon and Anaesthesiologist's discretion
- ☐ The plan for TXA and VTE prophylaxis must be discussed by the Surgeon and anesthesiologist at the start of the case

## IV Dosing – Administered by Anaesthesiologist

☐ Maximum infusion rate of 100 mg/min to avoid hypotension

| | |
|---|---|
| TKA (tourniquet) | 1 g IV infusion before tourniquet inflation<br>AND 1 g IV infusion at tourniquet release |
| TKA (NO tourniquet) | 1-2 g IV infusion before incision |
| THA | 1-2 g IV infusion (OR 10-20 mg/kg) before incision |

## Topical Dosing – Administered by Surgeon

| | |
|---|---|
| TKA & THA | 2 g - 3 g in 50 mL - 100 mL NS<br>Apply topically to joint for at least 3 minutes prior to closure |

## Contraindications

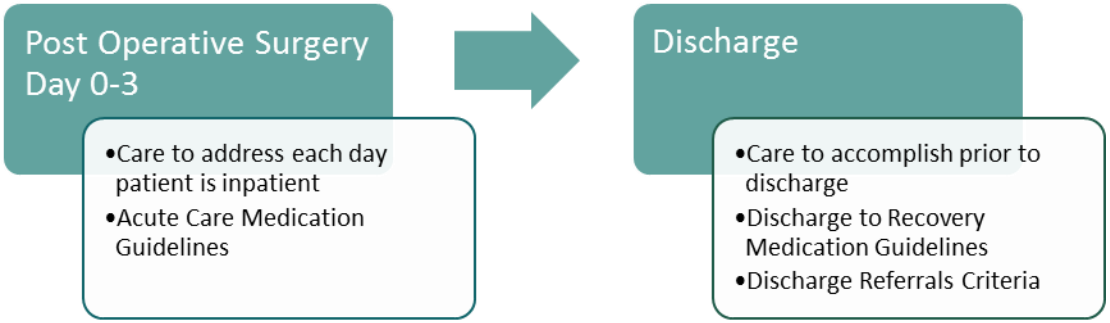
☐ **General**:

- Allergy
- Hypersensitivity to TXA

☐ **Precautions** (Contraindications to IV use – consider Topical use instead):

- Pts at elevated risk of arterial or venous thrombosis
  - Within 3 months or Recurrent: acute DVT/PE
  - Within 12 months: prosthetic cardiac valve or drug-eluding stent and receiving clopidogrel, prasurgrel or ticagrelor
  - Any anticoagulant therapy: e.g.: warfarin, DOAC, heparin, LMWH, etc.
  - Subarachnoid hemorrhage (potential for cerebral edema/infarction when given IV)
  - A-fib, A-flutter (no reliable safety data)
  - Received PCC or rFVIIa in past 4 hours
- Gross hematuria (potential ureter thrombosis)
- Uncontrolled seizure disorder
- Acquired disturbance of colour vision (prohibits assessment of one measure of toxicity)
- Severe Hepatic or Renal disease (e.g.: Creatinine clearance <30mLs/min)

# Hip and Knee Care Path – Acute Post-Operative Care



## Post Operative Days 0-3

### Assessments/Monitoring/Interventions

- ☐ **Follow prescriber's orders**
- ☐ **Medical management** conducted by designated prescriber:
  - Designated prescriber may be: Surgeon, PCP, IM, Hospitalist or Resident- site specific
  - Review Pt history and pre-op medications on return from surgery
  - Designated prescriber to follow Acute Care Medication section (see below)
- ☐ **Systems assessment** as per hospital protocol:
  - Skin assessment (Braden Scale)
  - Peripheral neurovascular assessment
  - DB & C q1h
  - Keep O2 sat greater than 92% or as prescribed
  - Assist Pt as needed with turning and positioning every 2 hours
  - Mechanical thromboprophylaxis at prescriber's discretion[14]
  - If Neuroaxial anesthetic was used, assess for adequate motor function prior to mobilization of Pt
  - Fluid balance monitoring (IV, oral, urine)
  - Saline Lock IV when intake adequate; Discontinue IV upon D/C or when no longer clinically indicated
  - If Foley catheter required discontinue use early post-op day one
  - Maintain normothermia (as per Safer Healthcare Now)[6]
  - Management of post-op hyperglycemia in diabetics (as per AHS Guidelines) [15]
  - Vital signs
  - Pain assessment
- ☐ Assess dressing and provide interventions (as per prescriber's orders and site-specific Wound Care Guidelines)
- ☐ Intermittent cold therapy for knees[16]

### Tests and Diagnostics

- ☐ For Pts symptomatic of low Hgb, do Hgb level and follow guidelines

**Blood Transfusion Guidelines:**

**Hgb < 100g/l and** signs and symptoms of impaired $O_2$ delivery, heart rate ≥ 100, SBP ≤ 90, RR ≥ 20, Dyspnea, Syncope, Angina, Confusion, ECG ischemic changes
**Action:** Give $O_2$, transfuse packed red blood cells 1 unit at a time and reassess

**Hgb ≥ 70 g/l** and no sign of impaired $O_2$ delivery, and no sign of cardiac history
**Action:** Monitor

**Hgb < 70 g/l**
**Action:** Transfuse red blood cells sufficient to raise Hgb to greater than > 70 g/l and reassess (1 unit should raise Hgb approximately 12 g/l)

- ☐ CBC, Electrolytes, Creatinine, Urea POD 1. Repeat as needed
- ☐ If on Warfarin prior to surgery, daily PT (INR) with goal to resume therapeutic INR levels
- ☐ Glucose monitoring in diabetics as per post-op unit routine & AHS Guidelines[15]
- ☐ Any Pt-specific tests
- ☐ **One** post-operative x-ray required within 12 weeks of surgery

Note: Timing is at Surgeon's discretion, may be completed during inpatient stay

- **Hips:**
  - AP pelvis centre 2"
  - Shoot through lateral affected hip to include stem
- **Knees:** AP and lateral

### Supporting Tools

Total Hip / Knee Arthroplasty Post-Operative Orders

## In-Hospital Consults

- ☐ PT
- ☐ OT
- ☐ Consults as required:
  - Anaesthesia
  - IM
  - Cardiology
  - Pain Service
  - Dietitian
  - Others…

## Nutrition

- ☐ DAT - High Fibre (diet restrictions as ordered or in place pre-operatively)

## Activity/Mobility

- ☐ Rehabbing 2 x per day
  - Independent ROM exercises between rehabbing visits
- ☐ Wt bearing as tolerated.
  - **For Revision**: Activity and WB at Surgeon's discretion
- ☐ **Mobilization** to begin within 4 hours post-op
  - Pts mobilized 10 steps or more on day of surgery
  - Encourage F/A exercises q1h
  - Transfers in/out of bed (assisted as required)
  - Up in chair for meals
- ☐ ADL practice with adaptive equipment as required
- ☐ For Hips ensure raised toilet seat/commode is in bathroom
- ☐ **Precautions:** At Surgeon's discretion
- ☐ Progressions Should be Observed:
  - Towards independent bed/chair transfers
  - Walking in room, bathroom and hallway as able (minimum 3 - 5 x per day)
  - Increasing distance, using walker or crutches (assisted as required)
  - To crutches as able
  - To walk on stairs

## Patient/Family/Buddy Responsibilities

- ☐ Adhere to inpatient plan
- ☐ Assist with ADLs
- ☐ Family/buddy fill D/C prescription day before D/C
- ☐ Ensure Pt has needed equipment
- ☐ Ensure all supports are in place in preparation

## Teaching for Discharge Preparation

- ☐ Reinforced precautions
- ☐ Encourage Pt to record exercises in log book
- ☐ Teach correct transfer techniques (bed/chair)
- ☐ Ambulation/ROM instruction
- ☐ Confirm home support services per surgical Pt agreement, or if required (See Discharge section for home care criteria)

## Acute Care Medication

<table>
<tr><th>Medication Type</th><th>Instructions</th></tr>
<tr><td>Bowel Management</td><td>☐ Assess and initiate bowel management<br>Prevention of post-operative ileus with routine dosing of laxatives</td></tr>
<tr><td>Antiemetics</td><td>☐ High-risk Pts will require an additional antiemetic to obtain adequate prophylaxis to prevent PONV<br>☐ Multimodal approach for prevention and treatment of PONV is recommended<br>If Pt experiences PONV, despite adequate prophylaxis, medications from a different class must be used</td></tr>
<tr><td>Antibiotics[7]</td><td>☐ Provide dosing coverage for 24 hours post-operative to all patients<br>☐ Use same antibiotic as pre-op</td></tr>
<tr><td>Anticoagulants [14, 17]<br>see VTE Guidelines</td><td>☐ It is preferable to continue the same anticoagulant drug from pre-operative to post-operative<br>American Academy of Orthopaedic Surgeons Clinical Guideline on Prevention of Pulmonary Embolism in Pts Undergoing Total Hip and Knee Arthroplasty (Modified to include Approved factor Xa inhibitors at recommended dose)
<table>
<tr><th></th><th>Standard risk of Pulmonary Embolism</th><th>Elevated risk of Pulmonary Embolism</th></tr>
<tr><td>Standard risk for major bleeding</td><td>Aspirin<br>Synthetic Pentasaccharides<br>Direct Factor Xa Inhibitor<br>Warfarin<br>LMWH</td><td>LMWH<br>Synthetic Pentasaccharides<br>Direct Factor Xa Inhibitor<br>Warfarin</td></tr>
<tr><td>Elevated risk for major bleeding</td><td>Aspirin<br>Warfarin</td><td>None</td></tr>
</table>
Duration:<br>☐ Duration should be 10-35 days from initiation of medication, at the Surgeon’s discretion of patient tailored medication regime.</td></tr>
</table>

<table>
<tr><th>Medication Type</th><th>Instructions</th></tr>
<tr><td>Analgesics[18]</td><td>
☐ Adequate pain relief post-operatively is essential to allow patients to fully participate in post-operative protocols and meet discharge goals. Attempt to maintain pain score less than 4/10<br>
☐ Communication regarding pain management orders between pain management, pharmacy, nursing and orthopedic Surgeon to occur as needed<br>
☐ Multimodal approach to pain control is optimal, employing non-opioid analgesics, nonsteroidal, opioids and nonpharmacological modalities<br>
☐ Patients will typically require opioid medication post-op. Opioid medication should be titrated to the minimum dose that allows patients to fully participate in post-operative protocols and meet discharge goals<br>
☐ Typical patients will require tapering doses of opioid medications for 6-12 weeks post-operative with the earliest discontinuation as possible being optimal<br>
☐ Long acting opioids should be avoided, unless patients are already on long acting opioids in the community<br>
☐ Chronic opioid use preoperatively is a negative indicator of post-operative outcome and attempts should be made to eliminate preoperative use of opioids<br>
Individual Pt assessments to be considered for providing analgesia:
<table>
<tr><th>Drug Category</th><th>Acetaminophen<br>(maximum 4g in 24 hours from all sources)</th><th>NSAIDs</th><th>Opioids</th></tr>
<tr><td rowspan="3">Cautions</td><td>Liver disease</td><td>Creatinine clearance <50</td><td>Elderly – use lower dosing</td></tr>
<tr><td>Elderly – use lower dosing</td><td>History of GI bleed</td><td>Opioid naïve – use lower dosing</td></tr>
<tr><td>-</td><td>Consider continuing Pts' regular pre-operative NSAIDs regime</td><td>Consider individualized dosing in Pts on regular pre-operative opioid regime to account for increased dosing needs</td></tr>
</table>
☐ Respiratory Depression:<br>
• Nalaxone should be readily available when using any opioid.<br>
• If sedation score is 3 and respiratory rate < 8/min, give first dose stat and call physician and respiratory technologist<br>
Sedation Score:<br>
0 = Alert<br>
1 = Sometimes drowsy<br>
2 = Frequently drowsy, easy to arouse<br>
3 = Somnolent, difficulty to arouse<br>
S = Normal sleep, easy to arouse
</td></tr>
<tr><td>Pruritus</td><td>☐ Ensure supportive therapy medications are ordered</td></tr>
</table>

## Criteria for Patient Discharge – All Must Be Met

- ☐ Eating and elimination patterns are approximating, or have returned to, normal
- ☐ Surgical incision is clean and dry, or arrangements for wound care have been made
- ☐ Pt is able to:
  - Do bed and chair transfers independently
  - Dress and toilet independently
  - Demonstrate movement precautions
  - Perform recommended home exercises
  - Walk independently with appropriate aids on the level and stairs – maintaining any WB restriction
  - Perform ADL and use necessary equipment and aids

  **Note: Pts may be discharged when not independent with any of above, <u>if appropriate assistance is available</u>**
- ☐ Appropriate D/C destination, transportation, equipment and any services (i.e. referrals) required are confirmed to be in place
- ☐ D/C prescriptions ordered by designated prescriber (see Recovery Medication section below)
  Note: additional/different medications required due to surgical or inpatient events to be determined by prescriber
  Note: BPMH reconciliation completed prior to D/C
- ☐ D/C teaching instructions and plan (documented in site-specific Pt D/C summary form) have been <u>received and understood</u> by the Pt, buddy and/or family

## Teaching Instructions and Discharge Plan Includes

☐ Topics to be covered by Nurse/PT/OT include:

- Follow-up appointments at Hip and Knee Clinic
- Exercises and precautions
- Referrals (see right)
- Incision care
- Medication:
  - Required prescriptions procurement
  - Anticoagulant administration
  - Analgesic administration and pain management
  - Appropriate analgesia tapering

## Suggested Tools

Patient Discharge Summary

## Guidelines to Staff Achieving Discharge

- ☐ Identify barriers to D/C early
- ☐ Identify potential variance from Pt agreement designed by Hip and Knee Clinic CM and **maintain regular communication with CM** [19]
- ☐ Confirm responsibility for medical management post D/C
- ☐ PCP engaged as needed and provided with inpatient summary and/or D/C information
- ☐ Complete D/C information summary upon D/C

Goal: D/C Pt without complications, as planned and scheduled

Goal: D/C Pt home wherever possible

## Referral Arrangement

☐ Referrals arranged and confirmed as required:

- Homecare (see criteria below)
- Outpatient PT (see criteria below)
- Sub-acute transfer (see sub-acute section below)

## Patient/Family/Buddy Responsibility

- ☐ Ensure understanding of D/C teaching instructions
- ☐ Family/buddy attend D/C instruction review with Pt and inpatient staff
- ☐ D/C medication brought to inpatient unit for review and reconciliation prior to D/C
- ☐ Family/buddy transport Pt back home

## Discharge to Recovery Medication

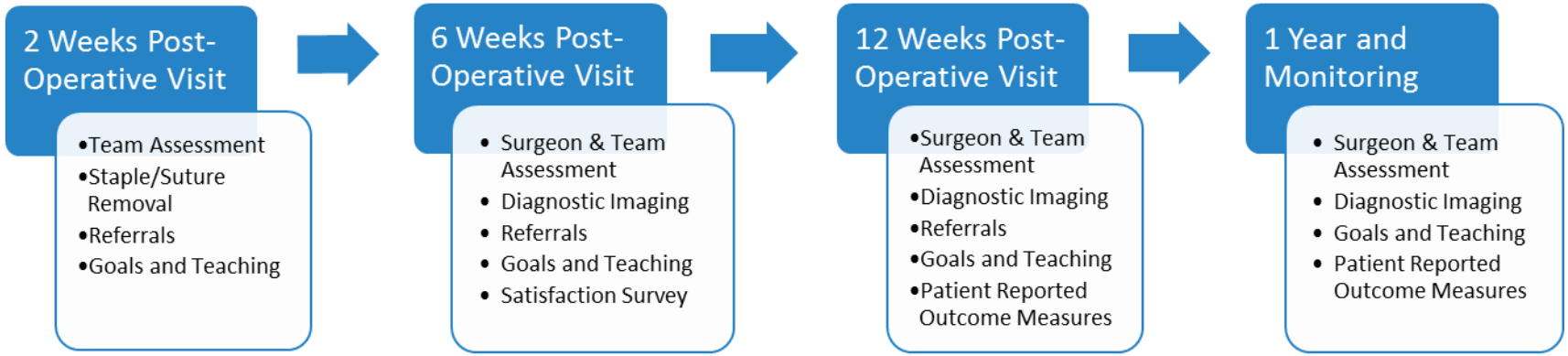
| Medication Type | Discharge to 2 Week Post-Op | 2-6 Week Post-Op | 6-12 Week Post-Op + Monitoring |
|---|---|---|---|
| **Bowel Management** | ☐ Sennosides 8.6 mg oral prn (HOLD IF stool loose)<br>☐ Glycerine suppository prn<br>☐ PEG 3350 (polyethylene glycol 3350) 17 g in 250 mL fluid orally daily for constipation (HOLD IF stool loose) | | N/A |
| **Antibiotics** | ☐ Routine antibiotic prophylaxis is not indicated for dental Pts with total joint replacements. At Surgeon discretion for high risk Pts. [20] | | |
| **Analgesics**[18] | ☐ Adequate pain relief post-operatively is essential to allow patients to fully participate in post-operative protocols and meet discharge goals. Attempt to maintain pain score less than 4/10<br>☐ Communication regarding pain management orders between pain management, pharmacy, nursing and orthopedic Surgeon to occur as needed<br>☐ Multimodal approach to pain control is optimal, employing non-opioid analgesics, nonsteroidal, opioids and nonpharmacological modalities<br>☐ Patients will typically require opioid medication post-op. Opioid medication should be titrated to the minimum dose that allows patients to fully participate in post-operative protocols and meet discharge goals<br>☐ Typical patients will require tapering doses of opioid medications for 6-12 weeks post-operative with the earliest discontinuation as possible being optimal. Devise an individualized plan for tapering to avoid opioid dependence<br>☐ Long acting opioids should be avoided, unless patients are already on long acting opioids in the community<br>☐ Chronic opioid use preoperatively is a negative indicator of post-operative outcome and attempts should be made to eliminate preoperative use of opioids | | |

| Medication Type | Discharge to Community Instructions |
|---|---|
| **Anticoagulants**[14, 17]<br>see VTE Guidelines | ☐ Follow anticoagulation drug established at D/C from acute care centre<br>☐ Continue anticoagulation drug for 10-35 days, at Surgeon's discretion |

## Discharge Referrals for Consideration

| Type of Referral | Criteria |
|---|---|
| **Homecare Post-Operative** | ☐ Requires personal care assistance to be safe with certain ADL e.g. bathing, walking, bed mobility, dressing, feeding, off and on toilet<br>☐ Pt's condition has changed and a home visit is required to assess and recommend equipment or strategies that will improve Pt safety and independent function at home<br>☐ Unable to:<br>• administer required medication<br>• change a wound dressing (if required) and/or requires monitoring of a draining incision<br>• leave the home for required physiotherapy treatments, exercises or monitoring |
| **Outpatient Physiotherapy Treatments Post-Operative** | ☐ **TKA, Knee Revision or Partial Knee** (if treatment is required, usually at D/C to 6 weeks post-op)<br>• Poor gait pattern or balance:<br>a. If requires gait correction within WB restriction<br>b. If requires progression of WB (if Pt is Wt bear as tolerated or has been given new WB orders)<br>• Poor quad contraction:<br>a. >15º quad lag<br>b. < Grade 2+ strength<br>c. Unable to do a straight leg raise against gravity<br>• Pain and Swelling Control<br>• Poor ROM:<br>a. <70º flexion<br>b. >15º flexion contracture<br>• If modalities decrease pain or swelling, making exercises more successful<br>• If Pt:<br>▪ would benefit from education regarding pain/swelling control techniques, activities and positions<br>▪ needs instruction with walking aids (weaning off aid when ordered)<br>▪ needs balance training or strengthening (to improve balance)<br>☐ **THA, Hip Resurfacing or Hip Revision** (if treatment is required, usually at D/C to 6 weeks post-op)<br>• Poor hip ROM:<br>a. < 45º flexion, <15º abduction<br>• Poor hip strength:<br>a. < Grade 2+ flexor strength<br>b. < Grade 2 abductor strength<br>• Poor gait pattern or balance:<br>a. If requires gait correction within WB restriction<br>b. If requires progression of WB (if Pt is WB as tolerated or has been given new WB orders)<br>c. If Pt needs instruction with walking aids (weaning down or off aid when ordered)<br>d. If Pt needs balance training or strengthening (to improve balance)<br>• Significant edema in the surgical leg (pitting, causing decreased leg ROM)<br>• If Pt would benefit from education regarding pain/swelling control techniques, activities and positions |

# Hip and Knee Care Path – Recovery[21]



# 2 Weeks Post-Operative Visit [21]

## Clinic Assessment

☐ **During Hip and Knee Replacement Clinic Team Evaluation within 10-14 days**:

- Staples/suture removal, as required
- Confirm surgical Pt agreement and plan adhered to
- CM/Team assess incision condition, i.e. swelling, pain:
  - Infection assessment as per AAOS guidelines[22]
- Rehabilitation/therapy assessment:
  - Assess ROM and gait
  - Confirm Pt maintaining precautions and WB status
  - Confirm using walking aid, bath room equipment, dressing aids
  - Complete post-op Physiotherapy Referral/Report
- Confirm medication as per Discharge to Recovery Medication section (see above) and Pt's D/C summary form
  - Address changes to individualized opioid tapering plan
  - Obtain altered prescriptions, as required
- Communicate with Pt's referring authorized practitioner or PCP regarding Pt issues, as required
- Confirm referral arrangement, as required

## Referral Arrangement

☐ Home Care, OT or PT if required (See Discharge Referrals section, above)

☐ 7 group PT sessions are available for post-op rehab for Pts requiring functional optimization

## Tests / Diagnostics

☐ If on Warfarin prior to surgery, complete daily PT (INR) post-operatively with goal to resume therapeutic INR levels (continue as ordered by GP/PCP)

## Nutrition

☐ DAT – maintain well balanced diet or diet as specified re. Canada Food Guide

## Patient Goals for Activity/Mobility

☐ Independent function:

- Transfers
- Ambulation/stairs
- Self care
- Dressing
- Home exercise program

☐ Progressive return to normal daily activities, as tolerated

☐ Progressive walking distance, as tolerated

## Teaching

☐ Educate Pt regarding pain medication, incision care, and potential complications (including swelling)

## Patient/Family/ Buddy Responsibility

☐ Encourage independent exercise and mobilization

☐ Support at home as needed (laundry, driving, meal prep, etc.)

## 6 Weeks and 12 Weeks Post-Operative Visit[21]

### Clinic Assessment

☐ **During Hip and Knee Replacement Clinic Team Evaluation at 6 and 12 weeks:**

- Pt is assessed by Surgeon and team, as appropriate
  - Assess infection assessment as per AAOS guidelines[22]
- Confirm medication as per Discharge to Recovery Medication section (see above) and Pt's D/C summary form
  - Address changes to individualized opioid and foundational analgesia tapering
  - Obtain altered prescriptions, as required
- Communicate with Pt's referring authorized practitioner or PCP regarding Pt issues, as required
- Referrals to post-operative out-Pt rehab, as required (see Discharge Referrals section, above)

☐ **6 Week Visit Only:**

- Confirm removal of bathroom equipment and dressing aids, as able
- Rehabilitation/therapy assessment, at Surgeon's discretion:
  - Confirm WB, exercises, walking aids progressed and activities progressed

☐ **12 Week Visit Only:**

- Confirm Pt achieved outcomes as defined in Surgical Pt Agreement
- Complete Hip/Knee Patient Reported Outcome and Experience Measures

### Patient Reported Outcome and Experience Measures

☐ At **6 Weeks** Pt completes:
- Pt Feedback Survey

☐ At **12 Weeks** Pt completes:
- EQ5D-5L
- WOMAC

### Nutrition

☐ DAT – maintain well balanced diet or diet as specified re. Canada Food Guide

### Suggested Tools

Hip and Knee Outcomes Tool (Combined WOMAC and EQ5D-5L)

Hip and Knee Patient Feedback Survey

### Test / Diagnostics

☐ INR for Pts on Warfarin (continue as ordered by GP/PCN)

☐ **One** post-operative x-ray required within 12 weeks of surgery
Note: timing is at Surgeon's discretion, may be completed during in-Pt stay

- **Hips:**
  - AP pelvis centre 2" low
  - Lateral of affected hip
- **Knees:**
  - AP, lateral and skyline view of affected knee

### Patient/Family/ Buddy Responsibility

☐ Encourage independent exercise and mobilization

☐ Support at home as needed (laundry, driving, meal prep, etc.)

### Patient Goals for Activity/Mobility

☐ Independent function: Transfers, Ambulation/stairs, Dressing, Self-care

☐ Possible return to driving, at Surgeon's discretion

☐ Progressive walking distance, as tolerated

☐ **6 Weeks**: continue home exercise; **12 Weeks**: exercise in community, as advised

☐ **6 Weeks**: WB as tolerated, progress to cane if able, full WB if cleared by Surgeon

☐ Progress to Recovery Exercises, as directed at relevant visit:

- Gravity resist, Theraband, light weights, ROM (gently into flexion past 90°)

### Teaching

☐ **At Surgeon's discretion:** Educate Pt regarding progression of exercises and functional movements

# 1 Year Post-Operative Visit and Monitoring[21]

## 1 Year Clinic Assessment

☐ **During Hip and Knee Replacement Clinic Team Evaluation at 6 and 12 weeks**:

- Pt is assessed by Surgeon and team, as appropriate
  - Assess infection assessment as per AAOS guidelines[22]
- Surgeon reviews all x-rays
- Communicate with Pt's referring authorized practitioner or PCP regarding Pt issues, as required
- Referrals to post-op out-Pt rehab, as required
- Complete Hip/Knee Patient Reported Outcome Measures

## Patient Reported Outcome Measures at 1 Year Visit

☐ Pt completes:

- EQ5D-5L
- WOMAC

## Monitoring Beyond 1 Year

☐ Goal: 100% primary joint Pts monitored every 2 years

☐ **Primary surgeries**: monitoring is completed every five years, at Surgeon's discretion

☐ **Revision surgeries**: monitoring is completed annually, at Surgeon's discretion

☐ Monitoring Actions:

- Surgeon's review of x-rays
- In-clinic assessment

☐ If prosthesis problem/issue/failure is identified, follow-up should be expedited [21]

☐ Routine antibiotic prophylaxis is not indicated for dental Pts with total joint replacements. At Surgeon discretion for high risk Pts[20].

## Suggested Tools

Hip and Knee Outcomes Tool (Combined WOMAC and EQ5D-5L)

## Tests / Diagnostics

☐ X-Rays at 1 year, and then aligned with recall frequency

- **Hips:**
  - AP pelvis centre 2" low
  - Shoot through lateral of affected hip
- **Knees:**
  - AP and lateral of affected knee
  - Merchant view of patella

## Patient Goals for Activity/Mobility

☐ Independent function

☐ Normal Daily activities

☐ Exercise in Community

## Patient/Family/ Buddy Responsibility

☐ Encourage normal function

## Nutrition

☐ DAT – maintain well balanced diet or diet as specified re. Canada Food Guide

# Hip and Knee Care Path –
# Care of Patients in Subacute

Alberta Health Services Bone & Joint Health Strategic Clinical Network™ | Covenant Health | Alberta Bone & Joint Health Institute

## Subacute Care

### Criteria for Transferring to Subacute Care (Primary and Revision) May Include:

- ☐ Unable to manage environment at residence, e.g. no home support, difficult living arrangements (stairs, levels, access to bath/ kitchen)
- ☐ Bilateral joint surgery
- ☐ Frail elderly with comorbidities
- ☐ Daily need for rehabilitative services and/or limited access to rehabilitation services
- ☐ Post-operative complications

### Information to Provide to Subacute Care Centre

- ☐ Inpatient D/C Information
- ☐ Relevant Precautions list/WB Status (prescribed at Surgeon's discretion)
- ☐ Include assessment of knee ROM (instructions to refer to community physio if less than 70° flexion and/or quad lag)
- ☐ Follow up appointment instructions (suture/staple removal) at 2 weeks' post-op
- ☐ General information sheet on THA/TKA for health care providers including
  - a. Brief description of surgery:
  - b. Copy of Surgical Pt Agreement (surgery – 1 year) so they understand plan:
    - Activity / Rehab expectations at subacute stage (including self care/ exercises/ activity)
    - Work toward independent transfers/ambulation/self care and dressing/ exercises
    - More time spent in activity than resting in bed (improving endurance, strength and function)
    - Issues to address for D/C from subacute facility to community
- ☐ Any nursing care required at home (dressing changes/ medication/bath)
- ☐ Any home adaptations and equipment required
- ☐ Any support/supervision required at home (family/friends/home care)
- ☐ Any meal/homemaking services needed at home
- ☐ Any exercise assistance/monitoring required at home
- ☐ Expectations/plan of activity/follow-up/outcome for community phase (subacute-12months)
- ☐ Contact phone numbers for questions/advice required by health care providers (clinic #)

### Medications

- ☐ **Bowel management:** see Acute Care Medication (page 23)
- ☐ **Antiemetics:** see Acute Care Medication (page 23)
- ☐ **Anticoagulants**[12, 15]**:** see Acute Care Medication (page 23)
- ☐ **Analgesics**[18]:
  - Check that analgesics/anti-inflammatories from acute care have been reassessed
  - See Acute Care Medication (page 23)

| Assessment / Monitoring for a Duration of Stay | Consults | Nutrition |
|---|---|---|
| ☐ Per Surgeon hip or knee orders:<br>• Adhere to standardized care path<br>• Adhere to surgical Pt agreement and plan<br>• Neurovascular and Physical Assessments<br>• Dressing changes if needed<br>☐ Communications:<br>• Hip and Knee Clinic CM communicates with designated subacute contact re potential variance from surgical Pt agreement<br>• CM or Pt's referring or PCP to oversee medical management<br>☐ D/C:<br>• Pt discharged without complications as planned and scheduled<br>• Subacute Record completed upon D/C and faxed back to Hip and Knee Clinic | ☐ As required | ☐ DAT -High Fibre (Diet restrictions as ordered or in place pre-operatively) |

| Activity/Mobility Goals |
|---|
| ☐ Assist with a.m. care as required |
| ☐ Rehabbing exercises 2 -3 x per day on unit |
| ☐ Up to bathroom at night |
| ☐ Up in chair for meals |
| ☐ Progress mobilization to minimum of 5X per day with walker or crutches, maintaining WB restrictions |
| ☐ Independent ROM exercises between rehabbing visits |
| ☐ Progress independent function Transfers/ Ambulation/ Stairs/ Self care/ Dressing |
| ☐ Pt to dress in own clothes (with/without assist) |

| Discharge Teaching | Patient/Family/ Buddy Responsibility |
|---|---|
| ☐ Anticoagulant self administration taught and supervised<br>☐ Analgesic administration taught<br>☐ Home Exercises<br>☐ ADL instruction: dressing, tub transfers, car transfers<br>☐ Equipment reviewed (dressing aids to be used as required)<br>☐ D/C instructions reinforced/completed by nurse<br>☐ Confirm follow-up appointments | ☐ Encourage independent exercise and mobilization<br>☐ Home prepared<br>☐ Support available<br>☐ Arrangements made for transport<br>☐ Transport home with goal of 10:00h<br>☐ D/C prescriptions filled by Pt support day before D/C and brought to inpatient unit for review and reconciliation prior to D/C.<br>Note: additional/different medications required due to surgical or inpatient events to be determined by prescriber. Modified prescription(s) to be filled by Pt support |

## References

1. College of Physicians & Surgeons of Alberta. Referral Consultation: Advice to the Profession. January 2017. http://www.cpsa.ca/wp-content/uploads/2017/01/AP_Referral-Consultation.pdf

2. Based on results and experiences in the Hip and Knee Replacement Pilot study, a 15 day standard from referral to first consultation was deemed achievable by the Physician Steering Committee. Although during the Hip and Knee Replacement Pilot there were no surgery backlogs or day-to-day operational issues involved, implementation of the care path aims to ultimately eliminate those backlogs and a 15 day standard can be achieved. Timely assessment is important to patient care, thus it is important that we continue to monitor progress toward this goal. At this time however, based on literature investigating Maximum Acceptable Waiting Time (MAWT), 8-12 weeks was deemed acceptable. ('There are too many of us to fix.' Patients' views of acceptable waiting times for hip and knee replacement. Conner-Spady B., Sanmartin C., Johnston G., McGurran J., Kehler M., Noseworthy T. EMBASE Journal of Health Services Research and Policy. 14(4)(pp 212-218), 2009) *Clinical Committee Consensus, December 7, 2010*.

3. A key principle of the care path states patients are required to participate in their care. Any surgery is stressful on the patient, and there are many things to remember and act upon. Additionally, each patient is required to designate a support person who will attend each clinic appointment and play an active role in preparing the patient for surgery, in achieving the planned length of stay, in transitioning the patient to home and in achieving desired recovery outcomes. A Surgical Patient Agreement has been developed to ensure patients and their support persons are informed of and, by signing, made accountable for arrangements contributing to optimal outcomes. Behavioural contracting is a strategy increasingly used by health professionals to improve patient compliance to health regimens. The literature provides evidence that contracts have been effective in promoting health behaviors by using reinforcement as a way to increase the likelihood that patients will follow instructions in order to reach agreed upon goals. *Clinical Committee Consensus, November 7, 2011*.

4. Lemaignen, A., Armand-Lefevre, L., Birgand, G., Mabileau, G., Lolom, I., Ghodbane, W., … Lucet, J.-C. (2018). Thirteen-year experience with universal Staphylococcus aureus nasal decolonization prior to cardiac surgery: a quasi-experimental study. *Journal of Hospital Infection*, *100*(3), 322–328. doi: 10.1016/j.jhin.2018.04.023

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6. Safer Healthcare Now! Prevent Surgical Site Infections Getting Started Kit. 2014.
http://www.patientsafetyinstitute.ca/en/toolsResources/Documents/Interventions/Surgical%20Site%20Infection/SSI%20Getting%20Started%20Kit.pdf

According to a 2006 Cochrane Review titled “Preoperative hair removal to reduce surgical site infection”. The evidence finds no difference in surgical site infections (SSIs) among patients who have had hair removal prior to surgery and those who have not. If necessary to remove hair then both clipping and depilatory creams results in fewer SSIs then shaving with a razor.” Due to the incidence of reaction to the depilatory creams, hair removal as needed should be performed with a clipper prior to entering the surgical suite. *Clinical Committee Consensus, October 15, 2009*.

7. Alberta Bone and Joint Health Institute. *Prophylactics antibiotic use in hip and knee arthroplasty (evidence review)*. Available at: ABJHI Evidence Review – Prophylactics Antibiotic Use

Alberta Health Services. Bugs and Drugs: Antibiotics Prophylaxis Recommendation for Adult Joint Replacement. http://www.bugsanddrugs.org/F90386B1-7292-4B28-AAB3-B51E69EE0626

8. Alberta Health Services. Safe Surgery Checklist. Policy and Forms. 2014.

9. Fletcher N, Sofianos D, Berkes MB, Obremskey WT. Prevention of perioperative infection. Journal of Bone and Joint Surgery - Series A 2007 Jul;89(7):1605-1618.
Ostrander RV, Botte MJ, Brage ME. Efficacy of surgical preparation solutions in foot and ankle surgery. Journal of Bone and Joint Surgery - Series A 2005 May;87(5):980-985.
Saltzman MD, Nuber GW, Gryzlo SM, Marecek GS, Koh JL. Efficacy of surgical preparation solutions in shoulder surgery. Journal of Bone and Joint Surgery - Series A 2009 01 Aug;91(8):1949-1953.

10. A literature review completed in 2016 demonstrated that foley use increases the risk of urinary tract infections and reduces mobilization. Studies comparing patients who received catheters verses those who did not showed low in and out catheterization and no adverse events for those who did not. Therefore, foley catheters should not be routinely used in patients receiving elective arthroplasty and should only be used if appropriate for the patient (eg enlarged prostate). *Clinical Committee Consensus, October 27, 2016.*

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Miller A, McKenzie J, Greenky M, Shaw E, Gandhi K, Hozack W, Parvizi J. Spinal Anesthesia: Should everyone receive a urinary catheter? A randomized, prospective study of patients undergoing total hip arthroplasty. Journal of Bone and Joint Surgery 95 (2013): 1498-503.

Tischler E, Restrpo C, Oh J, Matthews C, Chen A, Parvizi J. Urinary retention is rare after total joint arthroplasty when using opioid-free regional anesthesia. Journal of Arthroplasty 31 (2016): 480-483.

11. Alberta Health Services. Surgical Site Verification and Marking. Policy and Forms. 2017.
Capital Health. Summary of Corporate Administrative Directive #2.6.6. (http://www.intranet2.capitalhealth.ca/policies) and UAH Patient Care Manual Policy #21.8 (http://www.intranet2.capitalhealth.ca/uah-virtuallearningcentre/administrativepoliciesandprocedures/toc_care.htm)

12. Drains have not shown a clear advantage, represent an additional cost and expose patients to a high risk of transfusion (Walmsley et al., 2005). Based on Clinical Committee consensus and supporting evidence, the standard of care will be: “Hemovac drains – No Drains Hips or Knees” *Clinical Committee Consensus, October 15, 2009*
Walmsley, P. J., Kelly, M. B., Hill, R. M. F., & Brenkel, I. (2005). A prospective, randomised, controlled trial of the use of drains in total hip arthroplasty. *Journal of Bone and Joint Surgery - Series B, 87*(10), 1397-1401. .

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19. This care path item has been updated to include the possible use of a Hip and Knee clinic discharge facilitator on site at acute care centers. It is imperative that variances from the surgical agreement are identified as early as possible by an individual who is fully aware of the patient's circumstances in terms of what is required to ensure optimal outcomes. The surgical patient agreement includes planned discharge date and location and planned functional and social requirements. *Clinical Committee Consensus, October 15, 2009*.

20. Canadian Orthopedic Association Consensus Statement: Patients with Total Joint Replacements having Dental Procedures. 2016. http://www.coa-aco.org/images/stories/library/health_policy/Consensus_Statement_2016_Patients_with_Total_Joint_Replacements_having_Dental_Procedures.pdf (accessed October 2016).

21. The Clinical Committee has confirmed the importance of follow up appointments at two weeks, six weeks, twelve weeks and one year post surgery. At two weeks, a nurse at the clinic assesses progress, removes the staples, identifies the need for post-operative physiotherapy and enforces precautions. At six weeks, the surgeon assesses progress, orders x-rays if not previously completed and identifies any early concerns. At twelve weeks, the surgeon and care team re-assess progress, order x-rays if not previously completed and identify any concerns. Additionally, critical outcomes measures are to be collected at twelve weeks. At one year, surgical outcome is assessed and x-rays are reviewed.

Monitoring is completed every five years at surgeon's discretion for primaries and annually at surgeon's discretion for revisions. Monitoring requires a review of current x-rays and an in-clinic assessment. If prosthesis problem/issue/failure is identified, follow-up should be expedited. *Clinical Committee Consensus, December 13, 2012*.

22. American Academy of Orthopaedic Surgeons. Diagnosis of Periprosthetic Joint Infections of the Hip and Knee.

23. Alberta Bone and Joint Health Institute. *Outcomes of primary and revision aseptic total hip and total knee arthroplasty with antibiotic-loaded bone cement (evidence review)*. Available at: ABJHI Evidence Review – Outcomes of primary and revision aseptic total H&K with antibiotic-loaded bone cement