11. Geriatric Trauma

Educational materials and pathways regarding the evaluation and management of geriatric trauma patients.

- Advanced Care Planning and Palliative Care Consultation in Acute Care Surgery
- Indications for Geriatric Consultation In Trauma Patients
- Isolated Hip Fracture Protocol

Advanced Care Planning and Palliative Care Consultation in Acute Care Surgery

Purpose

To engage injured or ill patient’s and/or families in discussions regarding goals of care and advanced care planning early and provide guidelines for Palliative Care consultation to assist in facilitating discussions surrounding goals of care and expectations of recovery following injury.

Background/Definitions

Injury and illness is sudden, unpredictable and often life-altering. Patients and families display a variety of reactions after trauma and understanding the patient’s pre-existing psychosocial functioning is imperative to providing complete holistic care. Palliative care consultation can be a helpful service to patients by providing in depth discussion on goals of care related to prognosis and patient preferences, transitional planning, family support and symptom relief management.

Inclusion Criteria

- Age 55 years old or older
- ICU or SDCC admission (all ages)
- Multisystem injuries, specifically an upper and lower extremity injury
- >5 comorbidities
- Or provider discretion (consider things like homelessness, mental health, low social support, challenging injury)
- Should be done once in the inpatient setting- ie. Should not be done upon injury/in ER

Exclusion Criteria

- No absolutes

Diagnostic Evaluation

Patients should be assessed per ATLS guidelines with labs, imaging, consults, and interventions as deemed necessary by trauma team to determine extent of injuries, co-morbid conditions, and general prognosis.

Similarly, emergency general surgery patients should be evaluated and managed as deemed appropriate for the current clinical status/diagnosis.

Practice Recommendations for Management

All acute care surgery patients: WITHIN 24 HRS OF ADMISSION

- An advanced care planning discussion should be held with patients (and/or the patient's decision-making proxy) admitted to the trauma or emergency general surgery services within 24 hours of admission.
  - For patient's less than 19 years of age, discussions should occur with the patient's legal guardian/parent.
- This initial advanced care planning discussion should be led by an acute care surgery service provider (physician or APP).
- The initial advanced care planning discussion should address the following:
  - Code status
  - Identification of health care proxy and decision maker in event patient is unable to make decisions.
  - Identification of any advanced directives
  - Prognostication based on patient's injuries, co-morbid conditions, and clinical status.
  - Goals and expectations throughout hospitalization and upon discharge.
  - Frailty assessment in all patients >60 years of age (see Table 1) or in younger patients who have more than 5 pre-existing chronic medical conditions
  - Palliative care consultation screening (see Table 2)
  - Palliative care consultation indicated/not indicated
- All advanced care planning discussions should be documented in the electronic medical record under the note type "advanced care planning".
  - Note template: .ACSACPINITIALACPDISCUSSION
- Please use the ACP as an opportunity for a therapeutic discussion about the patient's injuries and prognosis, and likely need for additional support. The goal should be to help explain the patient's injuries, and guide expectations. If they are likely to need a facility, you can set the expectation that they may not go home, but give them encouragement to return home.

Triggers for Palliative Care Consultation based on initial advanced care planning discussion:

- Palliative care consultation should be considered if any of the following are present:
  - Positive palliative care screen (Category 1 or 2)
  - Frailty score greater than 3 (based on Frail Questionnaire, Table 1)
  - Pre-existing end-stage or terminal condition
  - A diagnosis with median survival less than 6 months
  - Death expected during same ICU/hospital stay
  - GCS<8 for greater than 1 week in patients >55 yrs.
  - Multi-system organ failure
  - Family disagreement with team, advanced directive or each other (lasting >2 days)

- Futility considered or declared by the medical team.
    - Family request
    - Acute Care Surgery attending discretion
- Palliative Care consultation ideally should occur early in patient's hospital course with a goal of assessing and managing the patient via "palliative care bundle" (see Table 3) within 72 hours of admission.

Triggers for Geriatrics Consultation for trauma patients based on initial advanced care planning discussion:

- All patients >75 years of age at admission
- Age 65-75, consider geriatric consultation if conditions listed below are present:
    - dementia
    - 10 or more home prescription medications
    - 2 or more ED visits or inpatient admission in past 6 months
    - not living independently or residents of nursing homes or assisted living facilities
    - provider discretion
- in cases where patient's meet criteria for both Geriatrics and Palliative Care consultation:
    - Request consultation of both services. Geriatrics will primarily assist with geriatric medical conditions, whereas Palliative Care will primarily assist with advance care planning/goals of care.
    - This should occur with ongoing communication between Geriatric Medicine, Palliative Care and Trauma teams.

Triggers for Family Meeting WITHIN 72 HRS OF ADMISSION

- All Category II patients require a family meeting within 72 hrs of admission.
- Any patient lacking an advanced directive or healthcare proxy AND potential for challenging hospitalization or disposition.
- Family meeting may be led by Palliative Care, Geriatric Medicine or Trauma.
    - An acute care surgery provider should be present for this discussion regardless of who leads the meeting.
- This advanced care planning discussion should be documented in the electronic medical record under the note type “advanced care planning”.
    - Note template: .ACSACPFOLLOWUP
- The 72hr family meeting/follow-up discussion should address the following:
    - Update on patient’s current clinical status with prognostication based on patient’s injuries, co-morbid conditions, and clinical status.
    - The patient and/or family’s insight into the current problem(s).
    - Hopes and fears for current hospitalization.
    - Focused care plans based on patient’s injuries, co-morbid conditions, and clinical status (i.e. best case scenario, more-likely scenario, worst case scenario) with a set time-frame for when we will re-evaluate the situation.
        - This should also include potential “what if’s” (e.g. trachs, PEGs/Feeding tubes, etc)

Follow-up Care

- Significant changes in a patient's clinical status, should prompt additional advanced care planning discussions as needed.
- If consulted, palliative care will continue to follow the patient throughout his/her hospital course as indicated.

Outcome Measures and Guideline Adherence

- Timing and documentation of initial advanced care planning discussions will be monitored on 80% of all trauma patients
- Timing and utilization of palliative care services will be monitored on all trauma mortalities and hospice/CMO discharges.
- Pathway will be re-assessed following a 3 month pilot study.

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Last Updated

October, 2024

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2. American College of Surgeons. Trauma Quality Improvement Program Geriatric Trauma Management Guidelines. https://www.facs.org/media/314or1oq/geriatric_guidelines.pdf
3. Fiorentino M, et al. Palliative care in trauma: Not just for the dying. *J Trauma and Acute Care Surg.* 2019:87(5):1156-1163.

Appendix and Supplemental Materials

Figure 1. Model for advanced care planning discussions and consultation of palliative care in trauma.

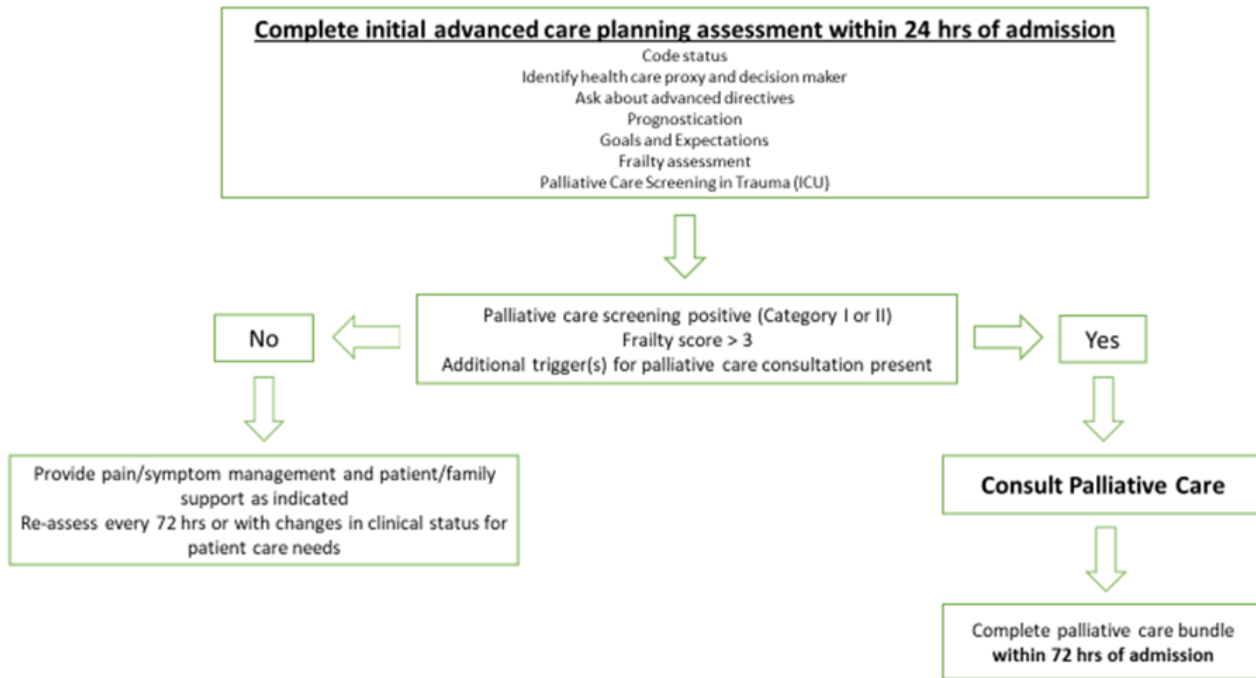


Table 1. 5 item FRAIL Questionnaire

F: Fatigue	Does the patient fatigue or get exhausted easily?
R: Resistance	Does the patient have difficulty walking up one flight of stairs independently?
A: Ambulation	Does the patient have difficulty walking one block (several hundred yards)?
I: Illnesses	Does the patient have 5 or more illnesses (comorbidities, including hypertension, diabetes, cancer [other than minor skin cancer], chronic lung disease, heart attack, congestive heart failure, angina, asthma, arthritis, stroke, and kidney disease)?
L: Loss of weight	Has the patient lost weight (5 to 10 percent) over the last six months to one year?

- 3 or more "Yes" answers indicates possible frailty
- 1 to 2 "Yes" answers indicates possible pre-frailty

Source: Morley JE, Malmstrom TK, Miller DK. A simple frailty questionnaire (FRAIL) predicts outcomes in middle aged African Americans. *J Nutri Health Aging*. 2012;16(7):601-608.

Table 2. Palliative Care Screening in Trauma

	Negative Screen	**Category 1: Positive Screen**	**Category 2: Positive Screen**
Traumatic Injury Severity	Non-life-threatening injuries	Potentially life-threatening injuries	Anticipated high risk of hospital mortality due to injury
Disability	Non-disabling trauma injuries	Potentially disabling injuries	Permanent disability or functional outcome incompatible with patient's wishes
Previous Functional Status	Healthy, no serious chronic illness	One or more serious illness, frailty, older age	Chronic serious illness, frailty, older age
Surprise Question	Surprise question: YES	Surprise question: MAYBE or NO	Surprise question: NO
Example: Young Patient	Young with… • Multiple fractures • Mild TBI • Abdominal GSW • Pneumothorax	Young with … • Spinal cord injury • Moderate TBI • Amputation • Any trauma plus shock	Young with… • Severe TBI • High spinal cord injury • Major hemorrhage • Multiple amputation
Example: Older Patient		Older or chronically ill with… • Mild TBI • Multiple fractures • Chest trauma • Low spinal cord injury	Older, frail, or end organ failure with… • Mild TBI • Multiple rib fractures • Any spinal cord injury • Any injury requiring surgery

Adapted for trauma patients from: Weissman DE, et al. *Patient Screening and Conversation Categories, Improving Generalist palliative care for hospitalized seriously ill patients*. The Palliative Care Network of Wisconsin. Available at: https://www.mypcnow.org/about1-c22s6. Accessed May 3, 2017.

*Surprise question example: "Would you be surprised if the patient died in the next 12 months?"

Table 3. Palliative Care Bundle

ALL Trauma Patients within the First 24 hours	CATEGORY I: Trauma Patients with a Positive Screen Within 72 hours	CATEGORY II: Trauma Patients with a Positive Screen Within 72 hours
• Identify health care proxy • Identify existing advance directives • Identify whether a DNR order or POLST exists	• Advance care plan • Goals of Care Conversation • Code status discussion	• Consider comfort measures • Consider focused Goals of Care Conversation • Consider DNR order and withdrawal of life-sustaining therapy
• Assess and treat pain, manage symptoms • Support the family	• Assess and treat pain, manage symptoms • Support the family	• Assess and treat pain, manage symptoms • Support the family • Offer bereavement, spiritual support
• Continue with full trauma care unless outcomes are clearly inconsistent with patient wishes	Care plan options: • Time-limited trials • Palliative care consultation	Care plan options: • Hospice • Transitions in care • Organ donation
• Begin palliative screen with prognostication based on injuries, frailty, and possible outcome(s); apply "surprise question"		

Guideline Algorithm

Advanced Care Planning and Palliative Care Consultation in Trauma

ALL TRAUMA ADMISSIONS

An advanced care planning discussion led by trauma provider to be held with all patients (and/or the patient's decision-making proxy) admitted and documented within 24 hours of admission.

This advanced care planning discussion completed before 24 hrs should be documented in the electronic medical record by trauma provider under the note type "advanced care planning" using .ACSINITIALACPDISCUSSION

- Code status
- Identification of health care proxy and decision maker in event patient is unable to make decisions.
- Identification of any advanced directives
- Prognostication based on patient's injuries, co-morbid conditions, and clinical status.
- Goals and expectations throughout hospitalization and upon discharge.
- Frailty assessment in all patients >60 years of age (see Table 1) **or** younger patients who have more than 5 pre-existing chronic medical conditions
- Palliative care consultation screening (see Table 2) where Surprise question is: "Would you be surprised if the patient died in the next 12 months?"
- Yes/no if patient triggered for Palliative Care consultation

Table 1: Frailtv Assessment

F: Fatigue	Does the patient fatigue or get exhausted easily?
R: Resistance	Does the patient have difficulty walking up one flight of stairs independently?
A: Ambulation	Does the patient have difficulty walking one block (several hundred yards)?
I: Illnesses	Does the patient have 5 or more illnesses (comorbidities, including hypertension, diabetes, cancer [other than minor skin cancer], chronic lung disease, heart attack, congestive heart failure, angina, asthma, arthritis, stroke, and kidney disease)?
L: Loss of weight	Has the patient lost weight (5 to 10 percent) over the last six months to one year?

- 3 or more "Yes" answers indicates possible frailty
- 1 to 2 "Yes" answers indicates possible pre-frailty

Source: Morley JE, Malmstrom TK, Miller DK. A simple frailty questionnaire (FRAIL) predicts outcomes in middle aged African Americans. *J Nutri Health Aging.* 2012;16(7):601-608.

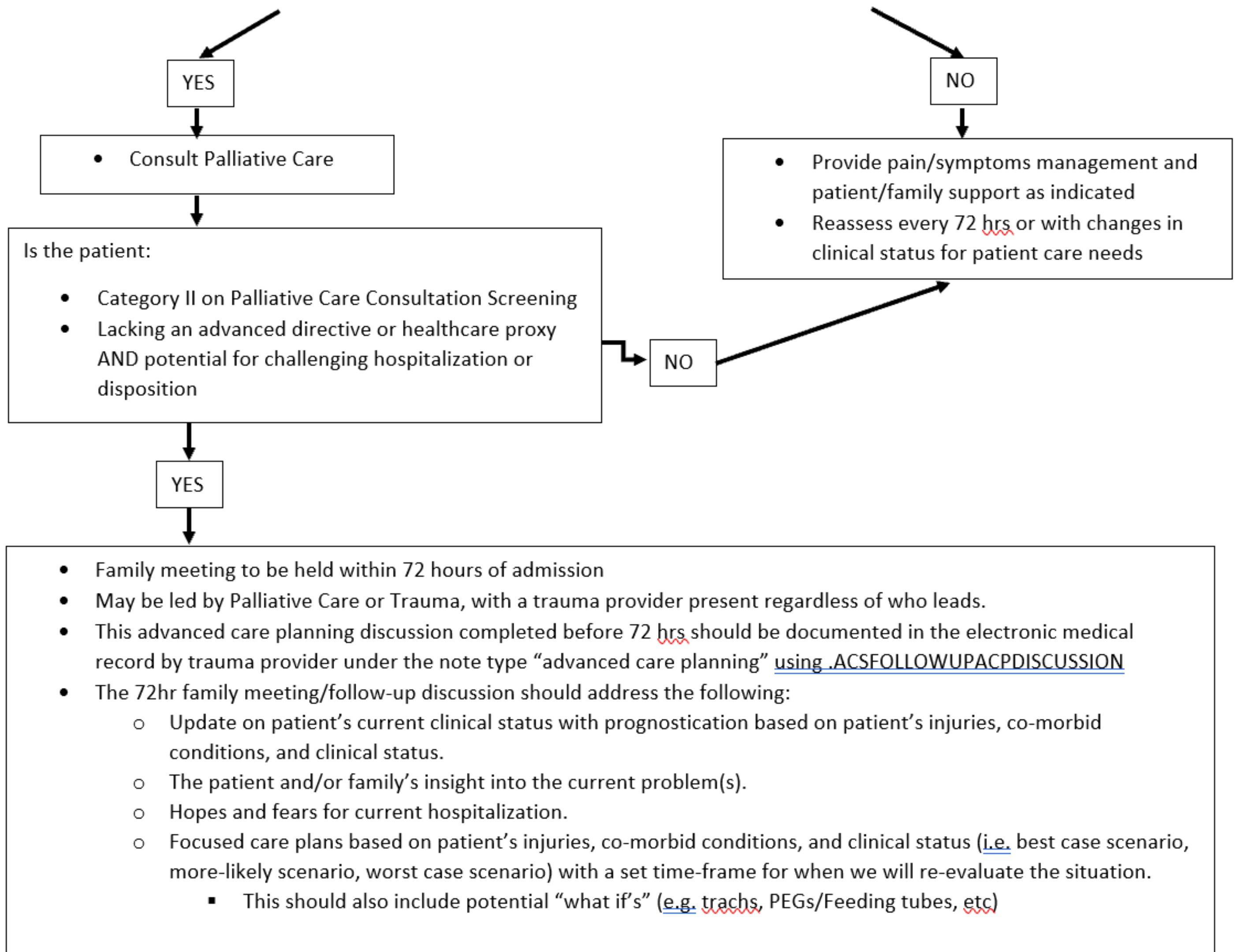
Table 2: Palliative Care Consultation Screening

	Negative Screen	**Category 1: Positive Screen**	**Category 2: Positive Screen**
Traumatic Injury Severity	Non-life-threatening injuries	Potentially life-threatening injuries	Anticipated high risk of hospital mortality due to injury
Disability	Non-disabling trauma injuries	Potentially disabling injuries	Permanent disability or functional outcome incompatible with patient's wishes
Previous Functional Status	Healthy, no serious chronic illness	One or more serious illness, frailty, older age	Chronic serious illness, frailty, older age
Surprise Question	Surprise question: YES	Surprise question: MAYBE or NO	Surprise question: NO
Example: Young Patient	Young with… • Multiple fractures • Mild TBI • Abdominal GSW • Pneumothorax	Young with … • Spinal cord injury • Moderate TBI • Amputation • Any trauma plus shock	Young with… • Severe TBI • High spinal cord injury • Major hemorrhage • Multiple amputation
Example: Older Patient		Older or chronically ill with… • Mild TBI • Multiple fractures • Chest trauma • Low spinal cord injury	Older, frail, or end organ failure with… • Mild TBI • Multiple rib fractures • Any spinal cord injury • Any injury requiring surgery

Adapted for trauma patients from: Weissman DE, et al. *Patient Screening and Conversation Categories, Improving Generalist palliative care for hospitalized seriously ill patients.* The Palliative Care Network of Wisconsin. Available at: https://www.mypcnow.org/about1-c22s6. Accessed May 3, 2017.

Based on first assessment (within 24 hrs of admission), are any of the following true?

- Palliative care screening positive for Category II or III
- Frailty score > 3
- Pre-existing end-stage or terminal condition
- A diagnosis with median survival less than 6 months
- Death expected during same ICU/hospital stay
- GCS<8 for greater than 1 week in patients >55 yrs.
- Multi-system organ failure
- Family disagreement with team, advanced directive or each other (lasting >2 days)
- Futility considered or declared by the medical team.
- Family request
- Acute Care Surgery attending discretion


YES
NO
Consult Palliative Care
Provide pain/symptoms management and patient/family support as indicated
Reassess every 72 hrs or with changes in clinical status for patient care needs
Is the patient:
Category II on Palliative Care Consultation Screening
Lacking an advanced directive or healthcare proxy AND potential for challenging hospitalization or disposition
NO
YES
Family meeting to be held within 72 hours of admission
May be led by Palliative Care or Trauma, with a trauma provider present regardless of who leads.
This advanced care planning discussion completed before 72 hrs should be documented in the electronic medical record by trauma provider under the note type “advanced care planning” using .ACSFOLLOWUPACPDISCUSSION
The 72hr family meeting/follow-up discussion should address the following:
Update on patient’s current clinical status with prognostication based on patient’s injuries, co-morbid conditions, and clinical status.
The patient and/or family’s insight into the current problem(s).
Hopes and fears for current hospitalization.
Focused care plans based on patient’s injuries, co-morbid conditions, and clinical status (i.e. best case scenario, more-likely scenario, worst case scenario) with a set time-frame for when we will re-evaluate the situation.
This should also include potential “what if’s” (e.g. trachs, PEGs/Feeding tubes, etc)

Indications for Geriatric Consultation In Trauma Patients

Purpose

Identify criteria for early geriatric consultation and geriatric expertise on the multidisciplinary trauma care team at the time of admission in order to optimize care of geriatric trauma patients throughout his/her hospital stay.

Criteria for Consultation

1. All patients >75 years of age at the time of admission.
2. For patients age 65-75 years of age, consider geriatric consultation if any of the following conditions are present on admission:
    1. Dementia
    2. Greater than or equal to 10 home prescription medications
    3. greater than or equal to 2 ED or inpatient hospital admissions in the last 6 months
    4. Not living independently at the time of admission (i.e. residents of nursing facilities or assisted living facilities)
    5. Provider discretion

Author(s)

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Last Updated

June, 2023

Isolated Hip Fracture Protocol

Section One: Timing and Care Sequence:

1. Presentation to the Emergency Room
    a. Assessment by the ED
    b. Radiographs
        i. Low AP pelvis, AP of affected hip, AP and lateral of affected femur
        ii. MRI indicated if high suspicion but no clear fracture on x-ray, CT scan if MRI not available

2. Admission and Consultation
    a. Patient admitted to Trauma
        After tertiary survey
        i. Trauma remains primary and SCM signs off
        ii. Trauma signs off, Ortho takes primary, SCM remains on case
        Trauma provider re-assigns primary treatment team so that all teams are aware of responsibilities.
    b. Ortho consult (called by Trauma provider)
    c. SCM consult (called by Trauma provider)
    d. Pain consult - Ortho confirms with patient they consent to a block; then calls APS (@ 402-650-9676) for FIB to be done within 4 hours.
    e. DEM consult (L. Armas will be contacted by Ortho)
    f. consider palliative care consult- can be consulted by any service
    g. SW consult (call not needed, just order)
    h. PT/OT consult on admission but not to begin evaluation or treatment until the morning after surgery. If arthroplasty, pt will have posterior hip precautions in place
    i. Foley only if clinically indicated

3. Orders
    a. Preoperative labs drawn
        i. CBC, CMP, PT/INR/PTT
        ii. Type and Screen. If Hgb < 8 Type and Cross.
        iii. Vitamin D: 25(OH)D level **Need to specify mass spect method
    b. Chest radiograph if clinically indicated (hx of heart or lung problems or sx)
    c. ECG if clinically indicated (hx of heart problems or new sxs)
    d. Pain Control
        i. Fascia Iliac block* see protocol below (The Ortho provider should call the Anesthesia Acute Pain Service 24/7 @ 402-650-9676 to notify them of the patient). Block should be placed within 4

hrs. of APS notification. (Catheter to be removed at end of OR case)

ii. Tylenol 1000mg TID scheduled; 650mg po TID if history of liver disease

iii. Celebrex 100mg BID scheduled

iv. If age>70, start Oxycodone 2.5mg po Q 3 hours prn, Dilaudid 0.4mg Q2hour prn severe pain

v. If age<70, start Oxycodone 5mg po Q 3 hours prn, Dilaudid 0.6 mg Q2 hours prn severe pain

vi. Weight-bearing Orders – toe touch weight-bearing

vii. Activity as tolerated

e. Warfarin

i. Hold warfarin

ii. If arthroplasty planned, give Vitamin K 2.5 mg IV x1 ASAP (Do not wait for labs)

f. For patients admitted in the evening, keep NPO in anticipation of OR next day, for patients admitted in the morning keep NPO for possibility of OR the same day. Allow Ensure Pre- Surgery CHO drink evening before; consume before midnight

g. Hold ACE-Is and ARBs at admission to decrease the risk of intraoperative hypotension, restart POD #1

Continue ACE-Is and ARBs if systolic BP > 160

Continue ACE-Is and ARBs if LVEF know to be < 30%

h. Continue beta-blockers/rate control medications

i. Order 2000 IU Vitamin D3 daily

4. Patient taken to OR: Goal is patient in the OR next day after admission (Goal: 24-48 hrs.)

5. Postoperative Course

a. Standard postoperative antibiotics x 1 dose (orthopedics orders)

b. Postop CBC, BMP, other labs as needed or based on medical comorbidities, not routine

c. Evaluate pre op anticoagulation medication. Consider Lovenox 30 mg subQ q 12 hours (pharmacy consult for dosing) for VTE prophylaxis x 4 weeks to start POD#1

d. Calcium carbonate 1000 mg (400 mg of elemental calcium) start once daily with food

e. If arthroplasty - nursing communication order for arthroplasty- input full order set for mobility

f. If present, remove Foley on POD #1, straight cath. if retention

g. Goal discharge to home or facility is < 48 hours

h. Mobility: Encourage Dangle within 6-8 hours of surgery with QID ambulation beginning on POD 1, activity as tolerated, WB as tolerated

i. Diet: Patient may resume normal diet post op day 0, protein supplements with each meal/snacks

j. Patient up in chair for all meals x 3

k. Multimodal pain regimen to include combination of Tylenol/NSAIDs

iii. Tylenol 1000mg TID scheduled; 650mg po TID if history of liver disease

iv. Celebrex 100mg BID scheduled

v. Narcotic regimen per Arthroplasty Order Set

Oral Opioids - Moderate/Severe Pain (GFR 30 or less, age 79 yrs. or less)

oxycodone 5 mg, oral, every 2 hours PRN, moderate pain, severe pain OR

tramadol 50 mg, oral, every 12 hours PRN, moderate pain, severe pain

IV Opioids - Breakthrough Pain (GFR 30 or less, age 79 yrs. or less)

hydromorphone 0.5 mg, intravenous, every 2 hours PRN, breakthrough pain OR moderate to severe pain and unable to take oral pain meds

Oral Opioids - Moderate/Severe Pain (GFR 30 or less, age 80 yrs. or more)
oxycodone 2.5 mg, oral, every 4 hours PRN, moderate pain, severe pain OR
tramadol 50 mg, oral, every 12 hours PRN, moderate pain, severe pain
IV Opioids - Breakthrough Pain (GFR 30 or less, age 80 yrs. or more)
hydromorphone 0.2 mg, intravenous, every 2 hours PRN, breakthrough pain OR moderate to severe pain and unable to take oral pain meds
Oral Opioids - Moderate/Severe Pain (GFR more than 30, age 79 yrs. or less)
oxycodone 5 mg, oral, every 4 hours PRN, moderate pain, severe pain OR
morphine 7.5 mg, oral, every 4 hours PRN, moderate pain, severe pain OR
tramadol 50 mg, oral, every 6 hours PRN, moderate pain, severe pain
IV Opioids - Moderate/Severe Pain (GFR more than 30, age 79 yrs. or less)
morphine 2 mg, intravenous, every 2 hours PRN, breakthrough pain OR moderate to severe pain and unable to take oral pain meds OR
hydromorphone 0.5 mg, intravenous, every 2 hours PRN, breakthrough pain OR moderate to severe pain and unable to take oral pain meds
Oral Opioids - Moderate/Severe Pain (GFR more than 30, age 80 yrs. or more)
oxycodone 2.5 mg, oral, every 4 hours PRN, moderate pain, severe pain OR
tramadol 50 mg, oral, every 6 hours PRN, moderate pain, severe pain
IV Opioids - Moderate/Severe Pain (GFR more than 30, age 80 yrs. or more)
morphine 1 mg, intravenous, every 2 hours PRN, breakthrough pain OR moderate to severe pain and unable to take oral pain meds OR
hydromorphone 0.2 mg, intravenous, every 2 hours PRN, breakthrough pain OR moderate to severe pain and unable to take oral pain meds

l. Vaccine reconciliation
m. Use of Recovery Milestone Checklist while in hospital
n. Develop Discharge Criteria
o. Gum chewing (sugar free) TID for 20 minutes
p. Utilize Static Meds Initiative (Early AM Meds to Beds delivery program)

6. Discharge: (3 appointments need to be made: bone health, orthopedics, primary care,
    a. BONE HEALTH: with Dr. Armas
    b. ORTHOPEDICS FOLLOW UP: Orthopedics team resident schedules Orthopedic Surgery
    c. PRIMARY CARE: Primary team makes appointment with PCP within 2weeks
    d. Primary service ensures detailed post-op instructions
        i. Wound care/dressing
        ii. PT/Activity
        iii. Follow up anticipatory guidance
        iv. Specific instructions on when to call the doctor (PCP vs Orthopedic Surgeon)
        v. Updated medication list
        vi. Continue calcium and vitamin D if they were on admission list or started inpatient.

Section Two: Specific Considerations for Anesthesia and Surgery

1. Anesthesia PreOp

a. Consider Neuraxial in all patients
b. Tranexemic Acid 1 gm IV at the beginning and end of the case
c. Any specific concerns for contraindications to surgery must be discussed between Attendings

2. Surgery
a. Arthroplasty: See pathway for anticoagulation
Case scheduled as Hip hemi-arthroplasty possible total hip.
b. CRPP/ORIF: See pathway for anticoagulation
Case scheduled as CRPP Hip, IMN Hip Fracture, Antegrade Femur Nail
c. Tranexemic Acid 1 gm IV at time of incision- same as spine
d. Standard preop antibiotics.

Section Three: Anticoagulation, Co-Morbidities and Specific Conditions

<u>A. Anticoagulation</u>

1. Anticoagulation for Arthroplasty (determined by Ortho upon eval in ED)
a. Antiplatelet agents
i. Continue Aspirin if history of CAD, stroke, TIA, or PAD. Irreversible antiplatelet effect persists for at least 5 days. If taking > 81 mg daily, reduce to 81 mg daily
ii. Discontinue P2Y12 inhibitors (clopidogrel, ticagrelor, or prasugrel) unless the patient is in the high risk window following coronary stent placement (policy MS54): Acute coronary syndrome within the past 12 months, bare metal stent in the past 1 month, or drug-eluting stent in the past 6 months
b. Warfarin (policy MP11)
i. If initial INR > 3, give additional Vitamin K 2.5 mg IV
ii. If initial INR > 1.5, type and cross for 2-4 units FFP
iii. Re-check INR 12 hours after vitamin K dose
iv. Goal INR for OR is 1.5 or less
v. Can proceed with surgery if INR 1.8 or less and patient can get FFP on the way to the OR (patient will receive GETA)
vi. Consider K Centra
d. DOACs (dibigatran, rivaroxaban, apixiban, edoxaban) (policy MS55)
i. Hold, clearly document time of last dose.
ii. Timing of surgery following last dose of DOAC
a. Factor Xa inhibitor (apixaban, edoxaban, rivaroxaban)
1. eGFR ≥ 30 = 24 hours
2. eGFR < 30 = 48 hours
b. Dabigatran
1. eGFR ≥ 80 = 24 hours
2. eGFR 30-80 = 48 hours
3. eGFR < 30 = 72 hours
c. Risks and benefits should be weighed by teams (ortho, medicine, geriatrics, and anesthesia) if delay > 24 hours is being considered.

2. Anticoagulation for ORIF/CRPP/IMN (Not arthroplasty)
a. Antiplatelet agents

i. Continue Aspirin if history of CAD, stroke, TIA, or PAD. Irreversible antiplatelet effect persists for at least 5 days. If taking > 81 mg daily, reduce to 81 mg daily

ii. Continue P2Y12 inhibitors (clopidogrel, ticagrelor, or prasugrel) if any of the following. Irreversible antiplatelet effect persists for at least 5 days. Acute coronary syndrome within the past 12 months, any cardiac stent, any peripheral artery stent, history of stroke or TIA

b. Warfarin

i. If initial INR > 3.0, administer Vitamin K 2.5 mg IV x 1

ii. If initial INR > 3.0, type and cross for 2-4 units FFP

iii. Goal INR for OR is 3.0 or less

iv. Can proceed with surgery if INR 3.0 or less

c. DOACs (dibigatran, rivaroxaban, apixiban, edoxaban)

i. Hold

ii. Do not delay surgery

3. Bridging Anticoagulation

a. Bridging therapy applies only to patients taking warfarin

b. Bridging therapy with heparin indicated if any of the very high risk conditions below (policy MS55):

Table 3. Warfarin Bridging Indications by Condition	
Condition	**Bridging Criteria**
Atrial Fibrillation[1]	• CHA_2DS_2-VASc ≥ 7 ○ If no ICH within the past three months • Stroke or TIA within the past 3 months ○ If no ICH within the past three months • CHA_2DS_2-VASc = 5 or 6 if both of the following ○ Any history of stroke or TIA ○ No patient-related bleeding risk factors
Mechanical Heart Valve[2,3]	• Any mitral valve • Older aortic valve (caged ball or tilting disc) • Stroke or TIA within the past 6 months • Bileaflet aortic valve with risk factor ○ Atrial fibrillation ○ Any history of stroke or TIA ○ Any thrombophilia ○ Left ventricular systolic dysfunction (LVEF < 40%)
Venous Thromboembolism[4]	• VTE within the past 3 months • Severe thrombophilia ○ Protein C deficiency ○ Protein S deficiency ○ Antithrombin III deficiency ○ Antiphospholipid antibodies ○ More than one non-severe thrombophilia mutation
Mural Thrombus	• Mural thrombus on imaging within the past 3 months • Stroke or TIA within the past 3 months

B. Comorbidity

Only unstable conditions should delay surgery. Evaluation of stable conditions must be completed within 24 hours of admission. If delay greater than 24 hours is anticipated, discussion between anesthesiology, Trauma, and hospital medicine is required within 8 hours of admission.

Statement of surgical readiness: One of these statements must be included in the SCM consultation report. If statement c is chosen, a discussion with anesthesiology, Trauma, and orthopedic surgery is required.

a. The patient is medically appropriate to proceed to surgery without further evaluation or management.
b. The patient will be medically appropriate to proceed to surgery when …
c. The patient is not medically appropriate to proceed to surgery. Delay or cancellation recommended.

Indications for surgical delay

- a. Active Acute Coronary Syndrome (EKG changes or elevated troponin)
  - i. Cardiology consult
  - ii. Delay OR until optimized
- b. Unstable Arrhythmia (hypotension or significantly uncontrolled)
  - i. Cardiology consult
  - ii. Delay OR until optimized
- c. Decompensated CHF with new symptoms: see “Patients requiring an echo”
  - i. Obtain TTE,
  - ii. Cardiology consult
  - iii. delay OR until optimized
- d. Acute respiratory failure
  - i. Obtain ABG for diagnosis of acute respiratory failure
    - a. $SaO_2 < 89$
    - b. $PO_2 < 55$
    - c. $PCO_2 > 55$ with $pH < 7.35$
  - ii. Obtain pa/lat CXR, procalcitonin, b-natriuretic peptide
  - iii. Delay OR until optimized
- e. Sepsis
  - i. Follow sepsis bundle for evaluation and treatment
  - ii. Delay OR until optimized

Other Comorbidity (not a reason to delay surgery)

- a. Cardiac
  - i. Revised Cardiac Risk Index (RCRI) score: {NUMBERS 0 TO 6)

RCRI Score	Risk of perioperative cardiac complication
0	0.4% (low cardiac risk)
1	0.9% (low cardiac risk)
2	2.4% (high cardiac risk)
>=3	5.4% (high cardiac risk)

ii. Based on RCRI score and exercise tolerance:

a. Beta blockade indicated: continue if currently taking

b. Statin therapy indicated: continue if currently taking, start if indicated based on 10-year ASCVD risk

c. Inpatient telemetry monitoring recommendation: indicated if significant arrhythmia or RCRI score > 2

iii. Echocardiogram indications

When a pre-operative echocardiogram is indicated	When a pre-operative echocardiogram is NOT indicated
Unexplained shortness of breath	Repeat assessment of a previous echo with no change in clinical status
Known heart failure with worsening dyspnea or other changes in clinical status	Routine pre-operative echo (no history or symptoms of heart disease)
Murmur in the presence of cardiac or respiratory symptoms	Documented trace or mild valvular abnormalities with no change in clinical status
Murmur in an asymptomatic patient where clinical features or other investigation suggests severe structural heart disease Examples include: • Loud/harsh murmur (>2/6) • Systolic crescendo-decrescendo murmur with absent S2 (severe AS) • Presence of S3 / S4 • LBBB or significant LVH on ECG • Cardiomegaly on CXR	Stable, asymptomatic patients with murmur where previous exam did not reveal significant pathology
Moderate or greater degrees of valvular stenosis or regurgitation and no echo within one year or a significant change in clinical status or physical exam since last evaluation	
New onset arrhythmia: atrial fibrillation, high burden of premature ventricular contractions (PVCs), supraventricular tachycardia (SVT), non-sustained ventricular tachycardia (NSVT)	

b. Pulmonary

i. STOP-BANG score, OSA risk: (high risk if STOP-BANG > 5 or if known OSA not treated with CPAP)

ii. Management of high risk patients

a. Continuous oximetry

b. Continuous elevation of the head of the patient's bed

c. Complete avoidance of benzodiazepines and sedatives

iii. Management of home CPAP while inpatient

a. Begin CPAP therapy at home settings in the PACU and don't remove it for 48 hours unless the patient is eating or is out of bed.

b. After 48 hours, CPAP with sleep only

c. Diabetes or hyperglycemia (glucose > 180)

i. Avoid dextrose-containing IV fluid

ii. Hold oral diabetes medications while inpatient

iii. Institute basal-bolus insulin therapy

iv. Goal glucose 100-180

d. Hypertension

i. See above for ACEI and ARB management

ii. Continue other antihypertensive medication without interruption

iii. Goal BP < 180/105

e. Delirium

i. High risk for delirium if any of the following

a. Diagnosis of dementia or mild cognitive impairment

b. History of delirium

c. Age ≥ 80 years

e. Transfer from a facility

ii. Prevention of delirium in high risk patients

a. Avoid sedatives (including benzodiazepines and sleep aids) and anticholinergics (including scopolamine patch)

b. Minimize opioids as able.

c. Frequent re-orientation and opening of window shades during the day recommended.

d. Allow sleep

f. Stress dose steroids

i. Continue the patient's home oral steroid regimen without interruption perioperatively

ii. If the patient takes > 7.5 mg prednisone (or equivalent dose of another steroid) daily, administer stress dose steroids. Hydrocortisone 100 mg IV in pre-op followed by 50 mg IV every 8 hours for 3 total doses.

g. Alcohol Use- see CIWA and Phenobarbital protocols

Key Contributors

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