About This Curriculum

- It is the responsibility of both the resident and the attending to go over the goals and guidelines included in this handbook
  - At the beginning of the rotation
  - At the conclusion of the rotation

- Additional materials and/or service handbooks may be provided by the attendings at the beginning of the rotation
Orthopaedic Infection Service Information

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Candice Burke, Administrative Assistant to Dr. Calhoun

Schedule

During the two month rotation, the PGY2 and PGY5 will spend two months with Dr. Calhoun.

Dr. Calhoun
Monday: Clinic at UHE, beginning at
Tuesday: OR at UHE, beginning at
Wednesday:
Thursday:
Friday:
Delineation of Resident Responsibilities:
Orthopaedic Infection Service: PGY2

I. Resident Responsibilities for Patient Care

Residents must be aware of all inpatients and consults on the orthopaedic service at Main with orthopaedic infections. Residents must attend all surgery on the Orthopaedic infection service. Residents must attend all clinics on the service. Residents must monitor C&S, and prescribe appropriate antibiotics for patients on the orthopaedic infection service.

II. Resident Level of Responsibility for Patient Care

Resident rotations are structured so that the residents have a one-on-one relationship with attendings. The level of responsibility given by the attending to the resident is determined by that attending, depending on the attendings’ assessment of the resident’s knowledge and skills, and the complexity of the procedure.

III. Resident Supervision

Attendings are responsible for the direct supervision of residents in both the clinic and the operating room, as well as in on-call situations. Attending physicians are available for consultation at all times.

The person ultimately responsible for the patient is the attending. The attending should be notified of any adverse change in a patient’s medical condition or vital signs, persistent pain that is not controlled with reasonable doses of analgesics, significant amounts of drainage from wounds, or of patients or patient’s family members that are upset about the care they are receiving. **The threshold to inform the attending of problems should be very low.**

Senior residents (PGY4 and above) are also directly responsible for the supervision of junior residents (PGY1, PGY2, and PGY3). This applies to all of the above situations (i.e. on-call, in clinic, in the OR). Senior residents must be available for consultation at all times. Ultimately, chief residents (all PGY5’s) are responsible for the supervision of all residents, regardless of PGY year.

IV. Performance Feedback
Attending staff members on the foot and ankle service are available at any time if questions or concerns arise. At the end of each rotation, each attending on the service will evaluate each resident assigned to the service. A meeting should be scheduled at the conclusion of the rotation to discuss performance and provide written feedback on the rotation.
I. Resident Responsibilities for Patient Care

Residents must be aware of all inpatients and consults on the orthopaedic service at Main with orthopaedic infections. Residents must attend all surgery on the Orthopaedic infection service. Residents must attend all clinics on the service. Residents must monitor C&S, and prescribe appropriate antibiotics for patients on the orthopaedic infection service.

II. Resident Level of Responsibility for Patient Care

Resident rotations are structured so that the residents have a one-on-one relationship with attendings. The level of responsibility given by the attending to the resident is determined by that attending, depending on the attendings’ assessment of the resident’s knowledge and skills, and the complexity of the procedure.

PGY5 residents are expected to be able to instruct and assess the junior resident on the service.

III. Resident Supervision

Attendings are responsible for the direct supervision of residents in both the clinic and the operating room, as well as in on-call situations. Attending physicians are available for consultation at all times.

The person ultimately responsible for the patient is the attending. The attending should be notified of any adverse change in a patient’s medical condition or vital signs, persistent pain that is not controlled with reasonable doses of analgesics, significant amounts of drainage from wounds, or of patients or patient’s family members that are upset about the care they are receiving. The threshold to inform the attending of problems should be very low.

Senior residents (PGY4 and above) are also directly responsible for the supervision of junior residents (PGY1, PGY2, and PGY3). This applies to all of the above situations (i.e. on-call, in clinic, in the OR). Senior residents must be available for consultation at all times. Ultimately, chief residents (all PGY5’s) are responsible for the supervision of all residents, regardless of PGY year.
IV. **Performance Feedback**

Attending staff members on the foot and ankle service are available at any time if questions or concerns arise. At the end of each rotation, each attending on the service will evaluate each resident assigned to the service. A meeting should be scheduled at the conclusion of the rotation to discuss performance and provide written feedback on the rotation.
Goals and Objectives
Musculoskeletal Infection – PGY2

I. Core Competency Areas

By the end of the PGY2 rotation in Musculoskeletal Infection, the resident should demonstrate progress towards obtaining excellence in each of the following core competency areas.

Patient Care

1. Demonstration of caring and respectful behaviors when interacting with patients and families
2. Procurement of thorough, logical, and concise patient histories with an emphasis on the musculoskeletal system
3. Responsiveness to the individual needs of patients and their families
4. Performance of physical examinations that are accurate, comprehensive, and directed to patient’s problems. This applies to the clinic, emergency department, and in-patient settings.
5. Integration of medical facts and clinical data as the basis for diagnosis
6. Evaluation of risks, benefits, and alternative treatments
7. Formulation and carry out of a complete and effective treatment plan (operative and non-operative)
8. Counsel of patient and family in treatment procedure, options, and potential outcomes
9. Dissemination of education and services to the patient which are aimed at preventing treatment complications and maintaining health
10. Understanding of and performance of medical procedures related to treatment plan
11. Ability to work well with entire team of health care professionals and be involved in care of the patient

Medical Knowledge

1. Exhibition of a fund of medical knowledge that is up-to-date and ability to cite literature appropriately
2. Investigation of topics as needed for clinical assignments
3. Understanding and use of basic science principles as related to medical practice

Practice-Based Learning

1. Assessment of ones own patient management skills and ability to make appropriate changes in practice
2. Integration of evidence from scientific studies in the care of patient’s problems
3. Demonstration of knowledge of study designs and statistical methods in order to evaluate scientific studies
4. Usage of available information technology to obtain and manage information
5. Willingness to take time to educate students and other health care professionals

Interpersonal Skills

1. Fostering of a compassionate, therapeutic relationship with patients and their families
2. Ability to listen to patients and include them in treatment decisions
3. Ability to listen to information provided by other members of the health care team

Professionalism

1. Respectfulness of patient wishes and ability to provide adequate counseling, education, and informed consent instructions to patients
2. Demonstration of an ethically sound practice of medicine
3. Demonstration of sensitivity to cultural, age, gender, and disability issues among patients

Systems-Based Practice
1. Knowledge of how to provide cost-effective care
2. Willingness to advocate for patients within the health care system
3. Referral of patient to appropriate practitioners and agencies within the health care system
4. Accessing of consultants appropriately and use of their assistance in the management of ongoing care

II. Specialty Specific Knowledge

*By the end of the PGY2 rotation in Musculoskeletal Infection, the resident should:*

1. Know the basic science of musculoskeletal infections: epidemiology, microbiology, biofilms, biomaterials and bacterial adherence.
2. Know the basic science of antibiotic treatment: pharmacology, pharmacokinetics, local treatment, systemic treatment.
3. Know the classic clinical presentation of musculoskeletal infection and the staging systems used in clinical evaluation.
4. Know and apply clinically the appropriate diagnostic modalities, including laboratory evaluation and diagnostic imaging.
5. Know how to perform surgical debridement and lavage.
6. Know how to diagnose and treat infections in these specific situations: open fractures, prosthetic joints, bite wounds.
7. Know how to diagnose and treat adult osteomyelitis, septic arthritis, and mycobacterial/fungal infections.
8. Know the practical guidelines for minimizing surgical site infections.
9. Know how to diagnose and treat surgical site infections.

II. Specialty Specific Psychomotor Skills

*By the end of the PGY2 rotation in foot and ankle/infection, the resident should be able to:*

1. Be able to diagnose infected total joints
2. Perform aspiration of joints
3. Perform adjustment of external fixators
4. Irrigate and debride chronic osteomyelitis
5. Perform a below knee amputation
Goals and Objectives
Musculoskeletal Infection – PGY5

I. Core Competency Areas

By the end of the PGY2 rotation in Musculoskeletal Infection, the resident should demonstrate further progress towards obtaining excellence in each of the following core competency areas.

Patient Care

1. Demonstration of caring and respectful behaviors when interacting with patients and families
2. Procurement of thorough, logical, and concise patient histories with an emphasis on the musculoskeletal system
3. Responsiveness to the individual needs of patients and their families
4. Performance of physical examinations that are accurate, comprehensive, and directed to patient’s problems. This applies to the clinic, emergency department, and in-patient settings.
5. Integration of medical facts and clinical data as the basis for diagnosis
6. Evaluation of risks, benefits, and alternative treatments
7. Formulation and carry out of a complete and effective treatment plan (operative and non-operative)
8. Counsel of patient and family in treatment procedure, options, and potential outcomes
9. Dissemination of education and services to the patient which are aimed at preventing treatment complications and maintaining health
10. Understanding of and performance of medical procedures related to treatment plan
11. Ability to work well with entire team of health care professionals and be involved in care of the patient

Medical Knowledge

1. Exhibition of a fund of medical knowledge that is up-to-date and ability to cite literature appropriately
2. Investigation of topics as needed for clinical assignments
3. Understanding and use of basic science principles as related to medical practice

Practice-Based Learning

1. Assessment of ones own patient management skills and ability to make appropriate changes in practice
2. Integration of evidence from scientific studies in the care of patient’s problems
3. Demonstration of knowledge of study designs and statistical methods in order to evaluate scientific studies
4. Usage of available information technology to obtain and manage information
5. Willingness to take time to educate students and other health care professionals

Interpersonal Skills

1. Fostering of a compassionate, therapeutic relationship with patients and their families
2. Ability to listen to patients and include them in treatment decisions
3. Ability to listen to information provided by other members of the health care team

Professionalism

1. Respectfulness of patient wishes and ability to provide adequate counseling, education, and informed consent instructions to patients
2. Demonstration of an ethically sound practice of medicine
3. Demonstration of sensitivity to cultural, age, gender, and disability issues among patients

Systems-Based Practice
1. Knowledge of how to provide cost-effective care
2. Willingness to advocate for patients within the health care system
3. Referral of patient to appropriate practitioners and agencies within the health care system
4. Accessing of consultants appropriately and use of their assistance in the management of ongoing care

II. Specialty Specific Knowledge

*By the end of the PGY5 rotation in Musculoskeletal Infection, the resident should:*

1. Know and teach the basic science of musculoskeletal infections: epidemiology, microbiology, biofilms, biomaterials and bacterial adherence.
2. Know and teach the basic science of antibiotic treatment: pharmacology, pharmacokinetics, local treatment, systemic treatment.
3. Know and teach the classic clinical presentation of musculoskeletal infection and the staging systems used in clinical evaluation.
4. Know, apply, and teach the appropriate diagnostic modalities, including laboratory evaluation and diagnostic imaging.
5. Know how to perform surgical debridement and lavage.
6. Teach junior residents to perform surgical debridement and lavage
7. Know how to diagnose and treat infections in these specific situations: open fractures, prosthetic joints, bite wounds.
8. Teach junior residents to diagnose and treat infections in open fractures, prosthetic joints, and bite wounds
9. Know how to diagnose and treat adult osteomyelitis, septic arthritis, and mycobacterial/fungal infections.
10. Teach junior residents to diagnose and treat adult osteomyelitis, septic arthritis, and mycobacterial/fungal infections
11. Know and teach the practical guidelines for minimizing surgical site infections.
12. Know how to diagnose and treat surgical site infections.

II. Specialty Specific Psychomotor Skills

*By the end of the PGY52 rotation in Musculoskeletal Infection, the resident should be able to:*

1. Be able to diagnose infected total joints
2. Perform aspiration of joints
3. Perform adjustment of external fixators
4. Irrigate and debride chronic osteomyelitis
5. Perform a below knee amputation
6. Teach junior residents to perform all of the above
7. Design external fixators
8. Make antibiotic beads
9. Perform an above knee amputation/disarticulation
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Orthopaedic Residency Program

Physical Exam Competencies
Orthopaedic Infection Service: PGY2 and PGY5

4 Cardinal Signs of Inflammation:

- Temperature:
  - Manual comparison of temperature in the affected area to the temperature on the contralateral side or in nearby tissues

- Pain:
  - With palpation
  - Through a range of motion: infected joint – “pain with micromotion”
  - Axial loading
  - Cellulitis vs. septic arthritis: pain with light touch vs. pain with gentle motion

- Swelling:
  - Generalized bilateral lower extremity edema
  - Generalized unilateral edema
  - Circumferential edema around a joint

- Erythema:
  - Magnitude, location, and pattern
  - Blanching: increased local blood flow

Other Local Clinical Signs:

- Joint effusion:
  - Fluid-filled bursae vs. true joint effusion
  - Milking technique, fluid wave – evaluate a knee effusion

- Drainage:
  - Quantity and quality of the drainage
    - Purulent fluid: thick, heterogeneous, off-white in color
    - Serous fluid: thin, homogeneous,
  - Presence of a sinus

Systemic Clinical Signs:

- Pulmonary system:
  - Observation of coughing, difficulty breathing, mucus production, oxygen saturation

- Urinary tract:
Presence of any urinary symptoms
- Urine should be analyzed for presence of infection

Gastrointestinal system:
- Nausea, vomiting, diarrhea, constipation
- Feces should be analyzed for presence of infection
- C. difficile colitis in the setting of antibiotic use

Cardiovascular system:
- Murmur
- Local vasculitis or thrombosis

Special Tests:
- “String sign” of a synovial fluid analysis

Physical Findings of Infection in a Pediatric Patient:
- Temperature > 38.5° C
- Refusal to walk, limp
- Loss of normal spinal rhythm on forward bending
- Rash
- Pseudoparalysis
- Erythema/warmth/swelling/tenderness near the ends of long bones
- Joint effusion/synovitis
- Limited joint ROM
Surgical Competencies
Orthopaedic Infection Service: PGY2

By the end of PGY2 rotation in foot & ankle/infection, the resident should be able to perform the following procedures:

1. Aspirate all major joints (hip, knee, ankle, shoulder, elbow, wrist)
2. Perform bone biopsy for C&S
3. Debride septic joints
4. Manage antibiotic beads (PMMA and/or Vanc, Tibra)
5. Perform a below knee amputation
Surgical Competencies
Orthopaedic Infection: PGY5

In addition to the surgical competencies indicated for the PGY2 rotation in foot & ankle/infection, by the end of PGY5 rotation in foot & ankle/infection, the resident should be able to perform the following procedures:

1. Perform an above knee amputation and a hip disarticulation
2. Perform I&D of ITJA
3. Perform an I&D of septic joints, both arthroscopically and open
4. To manage PMMA spacer of ITJA
5. To place wires and pins in Ilizarov fixation
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**Foot & Ankle/Infection Reading Lists – PGY2 and PGY5**

OKU Musculoskeletal Infections, 1st Ed.

All Chapters