Botsford Hospital

Neuromusculoskeletal Medicine Programs

Rev. 2/13
## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2-4</td>
</tr>
<tr>
<td>Neuromuscular Medicine Program Objectives</td>
<td>5-9</td>
</tr>
<tr>
<td>Educational Objectives</td>
<td>10-12</td>
</tr>
<tr>
<td>Osteopathic Principles and Practices</td>
<td>13</td>
</tr>
<tr>
<td>Curriculum Schedules</td>
<td>14-16</td>
</tr>
<tr>
<td><strong>Required Rotation Guidelines</strong></td>
<td></td>
</tr>
<tr>
<td>Neurology</td>
<td>17</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>18</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>19-20</td>
</tr>
<tr>
<td>Physical Medicine / Rehabilitation</td>
<td>21</td>
</tr>
<tr>
<td>Chronic Pain Management</td>
<td>22</td>
</tr>
<tr>
<td>Neuromusculoskeletal Medicine</td>
<td>23</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>24-25</td>
</tr>
<tr>
<td>Hospital Care</td>
<td>26</td>
</tr>
<tr>
<td><strong>Conclusion</strong></td>
<td>27</td>
</tr>
</tbody>
</table>
Botsford General Hospital  
Neuromusculoskeletal Medicine Programs

Overview
Three programs have been designed for implementation at Botsford within the context of the Michigan Statewide consortium. All programs have as their goal the expansion of osteopathic education for the participants in the program and for the hospital as a whole.

The first track is the NMM Emphasis Track. This track is designed for the resident interested in developing osteopathic skills without having to do an additional year of training. It allows for Family Practice (FP) certification but not NMM certification.

The second track is the NMM and Family Practice Integrated Program, which is designed for the resident who desires dual certification in NMM and FP. This program also will allow the resident to be eligible for program directorship after completion.

The third track is the NMM Residency Plus One Program which is designed to provide additional training in NMM. The Plus One Program will provide intensive training in NMM for those individuals who have previously completed training in a postdoctoral program. This program will allow for NMM certification and eligibility for program directorship after completion.

Goals
The programs are unique pathways designed for residents who are interested in pursuing additional training in osteopathic treatment and philosophy, primary care sports medicine, orthopedics and nonsurgical musculoskeletal medicine. The primary objective of all the programs is to provide an educational opportunity for residents to become proficient in neuromuscular medicine as it applies to primary care and osteopathic specialty practice.

Rationale for development of programs
The need for such programs is clear from review of the literature and through consideration of the current status of osteopathic medical education. Osteopathic training in NMM, while generally strong in the preclinical years, appears to weaken during clinical training and residency. Interestingly, 57% of osteopathic physicians were interested in or enthusiastic about osteopathic manipulative treatment when they were freshmen medical students. By the time they completed their residencies the number dropped to 34%.¹ This seems to indicate a lack of appropriate education on how osteopathic principles should be applied in clinical and residency training. Osteopathic principles are applied “sometimes” in about 39% of students in a recent study.² The same study demonstrated that OMT was taught significantly more in family medicine than any other rotation. These results point to the need for improved osteopathic education and point to family practice as perhaps the best setting for this improvement.

¹ Fry LJ. Preliminary findings on the use of osteopathic manipulative treatment by osteopathic physicians. JAOA 1996;96:91-96.
Rationale for development of programs (continued from page 1)
The NMM track, integrated residency, and plus one program are designed to improve the NMM education of the participant in the program and also to benefit the family practice program and the hospital. The resident will receive additional NMM training from NMM specialists and then will be able to apply this knowledge in lectures, in his/her resident continuity clinic, and in interaction with other residents, interns and students at the hospital. Increased educational opportunities will be provided for residents and house staff. Increased exposure of osteopathic medicine to the community will occur. In addition, there is the potential for the development of a hospital inpatient OMM service through these programs.

NMM Emphasis Track
The NMM emphasis track allows a OGME 2 or OGME 3 family practice resident to obtain additional training in osteopathic treatment and philosophy and primary care sports medicine. Residents may select to take the track for one year or may stay in the track for a total of two years. The resident is eligible to sit for the ACOFP boards according to the requirements of the ACOFP, but is not eligible to sit for the AOBNMM board exams.

Specifically, the track involves one of the family practice clinic half days a week spent with a physician specializing in NMM or NMM and sports medicine. This clinical schedule allows the resident to have continuity of training in NMM for an entire year or two years. It also allows time for application of principles learned with the NMM preceptor into the resident’s other two half days in the family practice continuity clinic. The NMM emphasis tracker is also required to spend at least one month per year in the program doing a rotation in an NMM specialty office. In addition, responsibilities include lectures and participation as table trainers for family practice lectures and other activities within the hospital.

Integrated Family Practice and Neuromusculoskeletal Medicine Residency
The integrated NMM/Family Practice residency program shares the same ideals as the NMM emphasis track. Its rationale for development is much the same as the emphasis track. Its goal is to provide additional NMM training to the family practice resident while bolstering OMM education in the residency and within the hospital. The residency differs in that it provides an additional year of training beyond the requirements of the ACOFP and in fulfillment of the requirements of the AOBNMM. The integrated residency program meets AOA requirements for both FP and NMM certification.

The OGME 2 and OGME 3 years are similar to the track program, but the presence of the OGME 4 year allows for extensive additional educational experiences. This training includes rotations in sports medicine, orthopedics, neurology, physical medicine and rehabilitation and NMM. The resident will also rotate among clinics of several OMM specialists. He/she will develop skills as an educator and researcher and achieve an understanding of integrating use of multidisciplinary aspects of patient care. The resident will gain an understanding of delivering cost-effective care while maintaining excellent quality of care. The resident will continue to provide lectures to the residents and house staff during this year. He/she will be present for at least one half day a week in the family practice resident clinic to see patients or assist in preceptorship of residents or
students. This presence in the FP resident clinic will provide an additional educational resource to those rotating through the clinic. The resident is eligible to sit for the ACOFP boards and the AOBNMM boards during OGME 4.

**Hospital Care**
In-patient care is to be incorporated into these residency programs through in-patient consultations. Consults will be given under the supervision of a physician who is board certified in NMM/OMM. Further description of hospital care goals and objectives can be found on page 27.

**Michigan State University Statewide Campus System**
Both residency programs participate in the NMM/OMM Consortium of the MSU Statewide Campus System. One to two didactic sessions will be offered each month, on the campus of MSUCOM. Responsibilities of resident participation are included in the following Program Objectives.

**Conference/Course Requirements**

**Integrated NMM/FP Residents** are required to attend the annual Convocation of the American Academy of Osteopathy twice during OGME 2, 3, and 4. They are also required to take the annual resident inservice examination either at Convocation or at the hospital each year during OGME 2, 3, and 4. Residents are required to complete a course in Cranial OMM during the residency program. This requirement will be waived with permission of the Program Director if this course has been completed prior to the beginning of the residency program.

**Residency Project Requirements**

**Integrated NMM/FP Residents** are required to submit finished two projects: one on a topic in NMM and one on a topic in primary care by the end of their residency. Topics must be submitted for approval to the NMM and FP Program Directors. The primary care project is due by the end of the OGME 3 year, and the NMM project is due by January 1st of the OGME 4 year.
Neuromuscular Medicine Program Objectives

Program Objectives
A Neuromuscular Medicine (NMM) Program Director will be appointed to ensure that program objectives are accomplished. Residents in the NMM Integrated Program and Emphasis Track shall fulfill all criteria specified in the Botsford Hospital Family Practice Residency Handbook, with additions and changes as listed in this handbook. The NMM Integrated Program shall meet all requirements for FP through the AOA and ACOFP, as well as NMM certification through the AOA. In addition, the Plus One Residency Program shall meet all requirements for NMM certification through the AOA.

Hospital Responsibilities
• Residents shall adhere to hospital policies regarding patient logs, resident papers, and acute and consultation care under supervision in the hospital setting.
• Residents shall attend all educational programs and courses as required by the FP and NMM programs.
• Residents shall attend all conferences and lectures as required by the FP program.
• Residents shall attend weekly NMM didactic sessions.
• Residents must attend 80% of all required meetings and educational programs to which he/she is assigned.
• NMM procedure log must be submitted to the NMM program director on a yearly basis.
• Residents shall attend hospital OPP Committee meetings.

Required Readings
• Foundations of Osteopathic Medicine. ed. Ward, Robert
• Pain Series. Calliet, Renee
• Orthopedic Neurology. Hoppenfeld
• Journals: AAO, AOA, Physical & Sports Medicine
• Position papers of the American College of Sports Medicine
• Principles of Manual Medicine, Greenman
• Osteopathic Principles in Practice, Kuchera
• Autobiography, Still
• Other journals, texts, and articles as assigned by the NMM program director.
Neuromuscular Medicine Emphasis Track

Eligibility Requirements of NMM Emphasis Track:
Acceptance within the Botsford Hospital Family Practice residency program.
Acceptance within the NMM emphasis track.
Adherence to all requirements within the FP program.
Good standing in the OGME 2 and/or OGME 3 years.

Responsibilities of NMM Emphasis Track Participants:
OGME 2 and/or OGME 3
• All requirements within the FP program as listed in the FP Residency Manual.
• One of the FP continuity clinic 1/2 days spent in continuity care at a neuromuscular medicine (NMM) clinic.
• Presentation of 6 lectures per year on NMM. Target audiences include FP residents, hospital lectures, MSU, and community groups.
• Monthly participation in NMM lectures as assistants and table trainers.
• Monthly journal club on NMM with the NMM program participants. Note: This is in addition to journal clubs within the FP program.
• Optional 1/2 day per month of attendance to NMM lecture series in lieu of one 1/2 day NMM clinic.
• Weekly NMM didactics with NMM program participants.
• Required one month rotation in NMM. - see schedule for details.
NMM / FP Integrated Residency Program

Eligibility Requirements of NMM Integrated Residency Participants:
Acceptance within the Botsford Hospital Family Practice residency program.
Acceptance within the NMM integrated residency program.

Responsibilities of NMM Integrated Program Participants:
Residents shall attend at least two annual meetings of the AAO during his/her participation in the integrated residency program. Total clinic half days are approximately 312 in FP and 156 in NMM during OGME 2-4. Residents will see a minimum of 120 individual patients and a minimum of 360 patient encounters in the NMM clinic.
In addition, residents must evaluate and provide OMT to a minimum of:
- 100 patients with a variety of medical diagnoses
- 100 patients with a variety of surgical diagnoses
- 100 patients with a variety of pediatric diagnoses
- 100 patients with variety of OB/Gyn diagnoses

Residents will also complete one basic or advanced course on osteopathy in the cranial field during OGME 2.
Specific yearly responsibilities are as follows:

OGME 1
- 1/2 days spent at the FP continuity clinic and one month in the NMM continuity clinic.
- Monthly participation in NMM lectures as assistants and table trainers as permitted by the OGME 1 schedule.
- Monthly journal club on NMM with the NMM program participants. Note: This is in addition to journal clubs within the FP program.
- Monthly attendance at didactic sessions of the NMM/OMM Consortium of the Statewide Campus System of MSU College of Osteopathic Medicine when permitted by the OGME 1 schedule.
- Weekly NMM didactics with NMM program participants.
OGME 2

- Two half-days at the FP continuity clinic and one 1/2 day spent in continuity care at the NMM continuity clinic and one month rotation at FP continuity clinic.
- Presentation of 3 lectures per year on NMM. Target audiences include FP residents, hospital lectures, MSU, and community groups.
- Monthly participation in NMM lectures as assistants and table trainers.
- Monthly journal club on NMM with the NMM program participants. Note: This is in addition to journal clubs within the FP program.
- Monthly attendance at didactic sessions of the NMM/OMM Consortium of the Statewide Campus System of MSU College of Osteopathic Medicine.
- Required four months rotation in NMM. - see schedule for details. Two months of the 12 total NMM rotation months must be spent as a dedicated inpatient OMM rotation.
- Weekly NMM didactics with NMM program participants.
- Residents shall attend hospital OPP Committee meetings.

OGME 3

- Two half-days at the FP continuity clinic and one 1/2 day spent in continuity care at the NMM continuity clinic.
- Presentation of 3 lectures per year on NMM. Target audiences include FP residents, hospital lectures, MSU, and community groups.
- Monthly participation in NMM lectures as assistants and table trainers.
- Monthly journal club on NMM with the NMM program participants. Note: This is in addition to journal clubs within the FP program.
- Monthly attendance at didactic sessions of the NMM/OMM Consortium of the Statewide Campus System of MSU College of Osteopathic Medicine.
- Required four months rotation in NMM. - see schedule for details. Two months of the 12 total NMM rotation months must be spent as a dedicated inpatient OMM rotation.
- Weekly NMM didactics with NMM program participants.
- Satisfactory completion of NMM paper on subject mutually agreed upon by resident and NMM program director.
- Completion of ACOFP boards.
- Residents shall attend hospital OPP Committee meetings.
OGME 4

- Two half-days at the FP continuity clinic and one 1/2 day spent in continuity care at the NMM continuity clinic.
- Presentation of 3 lectures per year on NMM. Target audiences include FP residents, hospital lectures, MSU, and community groups.
- Monthly participation in NMM lectures as assistants and table trainers.
- Monthly journal club on NMM with the NMM program participants.
- Monthly attendance at didactic sessions of the NMM/OMM Consortium of the Statewide Campus System of MSU College of Osteopathic Medicine.
- Required 4 months rotation in NMM—see schedule for details. Two months of the 12 total NMM rotation months must be spent as a dedicated inpatient OMM rotation.
- Weekly NMM didactics with NMM program participants.
- Satisfactory completion of NMM paper on subject mutually agreed upon by resident and NMM program director.
- Completion of eligibility requirements for AOBNMM boards.
- Residents shall attend hospital OPP Committee meetings.
I) Educational Objectives

A) Residents will become proficient in all educational objectives as outlined in the Family Practice Residency Manual.

B) Diagnostic Skills:
Residents will become proficient in obtaining an accurate history and arriving at the correct diagnosis of diseases and injuries to the systems listed under Section C.

C) Residents will become proficient in treating the following outpatient conditions using the principles and practices of NMM.

1) Upper extremity
   a) shoulder
      1) impingement syndrome
      2) supraspinatus and biceps tendinitis
      3) labrum tears
      4) assessment of instability
      5) neuromuscular imbalance
   b) elbow
      1) lateral epicondylitis
      2) medial epicondylitis
      3) neurological impingements
   c) wrist/hand
      1) sprains
      2) fractures/instabilities
      3) tendinitis

2) Lower extremity
   a) hip
      1) iliotibial band syndrome
      2) greater trochanteric bursitis
      3) capsulitis
      4) degenerative joint disease
      5) other
   b) knee
      1) meniscal injuries
      2) collateral ligament injuries
3) cruciate ligament injuries
4) patellofemoral injuries

c) foot and ankle
   1) sprains
   2) tendinitis
   3) plantar fasciitis
   4) toe problems/injuries
   5) neurological impingements

3) Thoracic and Lumbar Spine
   a) degenerative disk disease
   b) spondylolisthesis
   c) scoliosis
   d) spinal stenosis
   e) radiculopathy
   f) muscle imbalance and somatic dysfunction

4) Cervical Spine
   a) degenerative disk disease
   b) radiculopathy
   c) cord compression
   d) fractures
   e) sports related injuries

5) Cranial
   a) Cephalgia
      1) TMJ syndrome and malocclusion
      2) Migraine cephalgia
      3) Tension cephalgia
   b) Strain Patterns

*D) Residents will become proficient in NMM evaluation and management of
   common inpatient conditions:
1) Inpatient NMM Examination
2) COPD/Asthma
3) Postoperative Ileus
4) Pneumonia
5) Low Back Pain
6) Upper GI Complaints
7) Musculoskeletal Headaches
8) Chest Pain
9) Congestive Heart Failure/Edema

E) Diagnosis of neuromuscular imbalance patterns
F) Diagnosis of common entrapment neuropathies
*G) Management of common medical problems that occur in athletes
*H) Achieve proficiency in preparticipation physical examinations for participants in sports and recreational activities
*I) Proper ordering of laboratory tests and diagnostic imaging
J) Care for athletes at a local high school or sports team
K) Become adept at presenting appropriate educational material to coaches and athletes
L) Develop and coordinate physical therapy/rehabilitation programs for neuromusculoskeletal and athletic injuries
*M) Understand the indications and contraindications of various treatment modalities and exercise programs
*N) Participate in care of referral patients with sports and neuromusculoskeletal related problems
O) Perform OMM in conjunction with rehabilitation for sports and neuromusculoskeletal injuries
*P) Taping / bracing techniques.
Q) Residents will become proficient in NMM evaluation and management of common office medical conditions.

* These requirements are specific for the Integrated and Plus One Programs.
II. Osteopathic Principles and Practices

A. Principles

1. Understanding of basic osteopathic tenets.
   a. The body is a unit with mind, body, and spirit interrelations.
   b. The body has self-regulating, self-healing mechanisms.
   c. The body has structure-function interrelations.

2. Understanding of the definition of somatic dysfunction.

B. Familiarity with the following types of treatment are required:

1. Cranial strain patterns
2. Lift therapy
3. Appropriate prescription of PT / rehabilitation.
4. Visceral manipulation
5. Exercise prescriptions

C. Proficiency in the following types of treatment are required as well as awareness of when such techniques are best applied.

1. Myofascial release
2. Muscle energy
3. High velocity low amplitude
4. Articulatory and Still’s Technique
5. Indirect/functional technique
6. Basic cranial diagnosis and technique
7. Inhibition
8. Kneading and stretching.

D. Familiarity with office management and practice

1. Residents will rotate among clinics of OMM specialists.
2. Residents will develop skills as an educator and researcher and achieve an understanding of integrating use of multidisciplinary aspects of patient care.
3. Residents will develop understanding of cost-effective patient care while maintaining excellent quality of care.

* These requirements are specific for the Integrated and Plus One Programs.
NEUROMUSCULOSKELETAL MEDICINE EMPHASIS
FOR FAMILY PRACTICE RESIDENTS
CURRICULUM/ROTATION SCHEDULE

OGME 2

1 Month: Family Practice
1 Month: Internal Medicine (general)
2 Months: Internal Medicine (subspecialty)
Pick any two (1 month each)
   1. Pulmonary
   2. Cardiology
   3. GI (must be completed prior to ambulatory surgery month)
1 Month: Surgery (ambulatory)
1 Month: ENT
1 Month: Orthopedics
1 Month: OB
2 Months: Pediatrics
1 Month: Emergency Medicine
1 Month: OMM

52 Weeks Total

Family Practice Office: 2 half days per week
OMT Office: 1 half day per week

OGME 3

3 Weeks: Dermatology
3 Weeks: Endocrine
3 Weeks: Rheumatology
1 Month: Neurology
1 Month: Geriatrics
4 Weeks: PM&R/Sports Medicine
4 Weeks: Pediatrics
8 Weeks: OB/GYN
2 Weeks: Ophthalmology
2 Weeks: Urology
2 Weeks: Radiology
4 Months: OMM
9 Weeks: Elective

52 Weeks Total

Family Practice Office: 2 half days per week
OMT Office: 1 half day per week
INTEGRATED NEUROMUSCULOSKELETAL MEDICINE RESIDENCY CURRICULUM/ROTATION SCHEDULE

OGME 2

1 Month: Internal Medicine (general)
1 Month: Internal Medicine: GI (must be completed prior to ambulatory surgery month)
1 Month: Internal Medicine Subspecialty Elective: Pick one of two:
  • Pulmonology
  • Cardiology
1 Month: Family Practice
1 Month: ENT
1 Month: OB/GYN
1 Month: Pediatrics
1 Month: Emergency Medicine
4 Months: OMM*

52 Weeks Total

Family Practice Office: 2 half days per week
OMT Office: 1 half day per week

* Two months of the 12 total NMM rotation months may be spent as a dedicated inpatient OMM rotation in order meet Basic Standards requirements.

OGME 3

2 Weeks: Dermatology
2 Weeks: Endocrine
1 Month: Geriatrics
1 Month: Pediatrics
1 Month: Neurology
1 Month: OB/GYN
2 Weeks: Ophthalmology
2 Weeks: Urology
1 Months: Elective: IM Subspecialty
1 Month: Orthopedics
4 Months: OMM*

52 Weeks Total

Family Practice Office: 2 half days per week
OMT Office: 1 half day per week

* Two months of the 12 total NMM rotation months may be spent as a dedicated inpatient OMM rotation in order meet Basic Standards requirements.
INTEGRATED NEUROMUSCULOSKELETAL MEDICINE RESIDENCY CURRICULUM

OGME 4

1 Month: Rheumatology
1 Month: PM&R/Sports Medicine
1 Month: Orthopedics/Sports Medicine
3 Months: Elective
1 Month: Internal Medicine (subspecialty)
1 Month: Pediatrics
4 Months: OMM*

52 Weeks Total

Family Practice Office: 2 half days per week
OMT Office: 1 half day per week

* Two months of the 12 total NMM rotation months may be spent as a dedicated inpatient OMM rotation in order meet Basic Standards requirements.

ELECTIVE ROTATIONS

Based on surveys from previous residents, the following rotations are recommended for elective rotations:

1 Month: Behavioral Medicine/Chronic Pain
1 Month: Geriatrics
1 Month: Gynecology
1 Month: Family Practice
1 Month: Inpatient Pediatrics
1 Month: Orthopedics
REQUIRED ROTATION GUIDELINES
FOR PLUS ONE NMM RESIDENCY
Adapted from Basic Standards for Residency Training in NMM and OMM,
American Osteopathic Association, rev. 1/00

NEUROLOGY

Objectives: this rotation will assist the resident in understanding concepts of functional neurology and the interactions between the central, peripheral, and autonomic nervous systems and the musculoskeletal system. In addition, the resident will develop an understanding and the skills for treating various neurologic conditions using NMM.

A. Concepts

1. Understand the pathophysiology of common neurological problems amenable to conservative care.
2. Recognize complex neurological problems and obtain appropriate consultation.
3. Understand the anatomical and physiological considerations of the nervous system and the relationship of the central nervous system and peripheral nervous system to the body as a whole.
4. Understand the relationship between the primary respiratory mechanism and the functioning of the central nervous system.
5. Understand the blood supply, venous drainage, and CSF fluctuation in the central nervous system, and its cranial nerves.
6. Understand the role of structural and reflex changes in neurological dysfunction.
7. Diagnose and manage
   a. Cervical, thoracic and lumbosacral radiculitis
   b. Chronic pain syndromes
   c. Entrapment neuropathies
   d. Headache
   e. Trigeminal neuralgia
   f. Discogenic pain
   g. Myofascial pain
   h. Reflex Sympathetic Dystrophy
8. Diagnose and appropriately refer
   a. radiculopathy with nerve deficit
   b. CVA
   c. Peripheral neuropathy
9. Incorporate osteopathic manipulative treatment into the overall design of the treatment program of the neurological patient.

B. Skills

1. Perform neurological exam and structural exam on the neurological patient.
2. Perform osteopathic manipulative treatment on the patient with neurological disease as part of the overall treatment program.
RHEUMATOLOGY

Objectives: this rotation will assist the resident in developing skills for diagnosing rheumatologic conditions and their role in disorders of the neuromusculoskeletal system. In addition, the resident will learn the appropriate use of consultations from a specialist in rheumatology.

A. Concepts

1. Understand the anatomy and physiology of synovial joints.
2. Understand the role of the articulated human skeleton in the overall function of the body.
3. Understand the pathophysiology of common rheumatological diseases amenable to conservative care.
4. Recognize complex and severe rheumatological diseases and make appropriate referrals.
5. Understand the physiology and pathophysiology of the immune system.
6. Understand the physiology of inflammation and the pathophysiology of chronic inflammatory processes.
7. Understand and recognize the systemic effects of immune and inflammatory diseases.
8. Understand the role of the lymphatic system in immune function and the resolution of the inflammatory process.
9. Diagnose and manage, or participate in the management of:
   a. rheumatoid arthritis
   b. gouty arthritis
   c. SLE
   d. Osteoarthritis
   e. Spondyloarthopathies
   f. Polymyalgia rheumatica
   g. Lyme disease
   h. Chronic regional pain syndromes
10. Design an overall treatment program that incorporates the use of osteopathic manipulative treatment in the rheumatological patient.

B. Skills

1. Perform an examination of the joints of the body.
2. Develop appropriate referral patterns
3. Perform osteopathic manipulative treatment as part of the overall treatment program for the patient with rheumatological disease.
ORTHOPEDICS

Objectives: this rotation will assist the resident in developing diagnostic skills for orthopedic conditions and injuries and the role of NMM in treating these patient problems. The resident will also develop an understanding of the role of appropriate consultations from orthopedic specialists.

A. Concepts

1. Understand the anatomy, physiology and healing processes of living bone, joint capsules, ligamentous and related soft tissue structures.
2. Understand the relationship between the skeletal system and the physiologic functioning of the body as a whole.
3. Understand the blood supply, innervation and venous and lymphatic drainage of bone, periosteum, ligament, tendon, and related soft tissues.
4. Recognize the presence of somatic dysfunction in the skeletal and associated tissues, and the role it plays in the function of those tissues, and its disease processes.
5. Understand the pathophysiology of non-surgical orthopedic problems amenable to conservative care.
6. Recognize fractures and surgical orthopedic diseases and make appropriate referrals.
7. Understand principles and indications for prolotherapy.
8. Understand principles and indications for intraarticular injections.
9. Diagnose and manage
   a. Acute and chronic sprains
   b. Acute and chronic strains
   c. Bursitis/tendonitis
   d. Discogenic disease
   e. Failed back syndrome
   f. Capsulitis
   g. Epicondylitis
   h. Sciatica/piriformis syndrome
   i. Costochondritis
   j. Coccydynia
   k. Spondylolisthesis
   l. Degenerative joint disease
   m. Gravitational strain
   n. Postoperative hip and knee surgery
   o. Scoliosis
   p. Enthesopathy
   q. Ligament and joint instability
   r. Common sports injuries
10. Incorporate osteopathic manipulative treatment into the overall treatment of orthopedic diseases.
11. Understand the role of pharmacologic management in the acute and chronic pain pt
B. Skills

1. Perform an examination of the musculoskeletal system.
2. Develop appropriate referral patterns.
3. Examine for ligamentous laxity and understand use of prolotherapy.
4. Examine for postural decompensation and apply or refer for orthotics, prosthetics, and or osteopathic postural management strategies to affect coronal, saggital, and horizontal plane imbalance.
5. Perform osteopathic manipulative treatment on patients with orthopedic diseases.
6. Perform trigger point injections.
Objectives: the resident will achieve an understanding of the role of PM&R for treatment of inpatient and outpatient medical conditions and the role of NMM in rehabilitation medicine. The resident also will focus on developing an understanding of the roles of exercise prescription, physical therapy and occupational therapy in treating patients with neuromusculoskeletal conditions and how to prescribe physical and occupational therapy.

A. Concepts

1. Understand the role of exercise in the rehabilitation of the patient with neuromuscular disease.
2. Understand the different responses of postural and phasic muscles when stressed.
3. Understand the role of physical and occupational therapy in the rehabilitation of the patient with neuromuscular disease.
4. Learn the various modalities and treatments available through PT and OT, their uses and indications in the rehabilitation process.
5. Design appropriate exercise, PT, and OT prescriptions for outpatients.
6. Recognize the need for rehab consultation in complex and difficult cases.
7. Understand the role of osteopathic manipulative treatment in the overall rehabilitation of the patient with neuromusculoskeletal disease.
8. Understand the role of orthotic devices.

B. Skills

1. Make appropriate exercise, PT and OT prescriptions
2. Make appropriate rehab consultations
3. Perform osteopathic manipulative treatment as part of the overall rehabilitation process.
Objectives: the resident will develop an understanding of the many treatment modalities that are available for the treatment of chronic pain conditions, and the use of appropriate referrals to chronic pain management specialists.

A. Concepts

1. Discography and radiofrequency treatment of symptomatic discs
2. Regional sympathetic blocks
3. Regional anestheisa
4. Epidural blocks
5. Facet blocks, medial nerve branch blocks and facet rhizotomies
6. Spinal cord stimulators and implantation of opioid delivery systems in the chronic pain patient
7. Spinoscopy

B. Skills

1. Perform an examination of the musculoskeletal system.
3. Develop appropriate referral patterns and interrelationships with anesthesiologists who do work with acute and chronic pain patients.
3. Perform OMT on acute and chronic pain patients when indicated.
4. Assess movement and muscle firing patterns of injured/ painful patients and prescribe appropriate exercise and pharmacologic therapeutics.
6. Evaluate proprioceptive skills of chronic pain patients and instruct in
Objectives: The resident will learn to use palpatory skills to identify clues for the differential diagnosis of neuromusculoskeletal problems, and design osteopathic manipulative treatment plans and rehabilitation to improve the function of the neuromusculoskeletal system. The resident will be trained in the overall evaluation and patients with neuromusculoskeletal problems, as well as how to appropriately refer patients for specialty consultation when indicated. The resident will evaluate and treat patients with a broad variety of diagnoses.

A. Concepts

1. Understand the physiology of acute and chronic pain
2. Understand the structural consequences of trauma in addition to fracture, enthesopathy, sprain and joint instability.
3. Understand somatic referral patterns as in sclerotomal, myotomal, and dermatomal distributions as well as those specific to myofascial trigger points, ligamentous strains and discogenic injuries.
4. Understand the role of somatic dysfunction in diseases of the neuromusculoskeletal and visceral systems.
5. Learn to diagnose and manage neuromusculoskeletal diseases including the utilization of diagnostic tests and all aspects of conservative management.
6. Expand expertise in the dosage, drug interactions, indications, and contraindications of pharmacologic agents used in the management of acute and chronic pain, including but not limited to:
   a. anti-inflammatory medications
   b. skeletal muscle relaxants
   c. antidepressants
   d. analgesics
7. Learn to seek specialty consultation from all sub-specialties listed below for the overall evaluation of neuromusculoskeletal diseases.
8. Understand the role of osteopathic manipulative treatment, joint stabilization and rehabilitation in the overall management of neuromusculoskeletal disease.

B. Skills

1. Perform a neuromusculoskeletal physical exam
2. Initiate treatment programs for neuromusculoskeletal patients.
3. Develop appropriate referral patterns.
4. See previous section on Educational Objectives: Osteopathic Principles and Practice for additional information.
Objectives: The resident’s training should include training by specialists in NMM as well as pediatrics or family practice in both inpatient and outpatient settings, and can be met through longitudinal and hospital care. Osteopathic evaluation and treatment should be a part of this rotation, therefore it is unacceptable to rotate solely as a pediatric intern or resident without involvement of NMM.

A. Concepts

1. Understand the structural and reflex changes that accompany pediatric diseases.
2. Understand the role of these findings in the pathophysiology of the disease process.
3. Understand the unique host response of the pediatric patient to both illness and to enhancement of homeostasis.
4. Understand how structural findings are incorporated into the overall work-up of the pediatric patient with other aspects of physical exam and diagnostic tests and procedures.
5. Understand how somatic dysfunction may restrict the process of growth and development, and how osteopathic manipulative treatment may influence this physiological process.
6. Incorporate the understanding of anatomy, physiology, and pathophysiology into the development of a manipulative treatment plan to directly assist the recovery from the disease process.
7. Understand the diagnostic procedures and osteopathic medical management of the pediatric patient.
8. Understand the physical diagnosis and differential diagnosis of the pediatric patient.
9. Be familiar with age related changes in dosage and drug interactions of medications frequently utilized by the specialist in NMM, including but not limited to:
   a. anti-inflammatory medications
   b. skeletal muscle relaxants
   c. antidepressants
   d. analgesics

B. Skills

1. Develop the palpatory skills necessary to recognize the structural and reflex changes that accompany pediatric illnesses, to the degree that these findings may assist in the process of differential diagnosis.
2. Develop the skills necessary to apply osteopathic manipulative treatment to the entire spectrum of pediatric patients, regardless of age or the severity of the disease.
3. Reinforce skills of physical diagnosis and differential diagnosis in the pediatric patient.
4. Develop skills to provide preventive medical management and health enhancement to
the pediatric patient.

C. General pediatrics

1. Concepts

a. Understand the unique anatomy of the pediatric patient, including the development of osseous structures, the immune system, the circulatory system, and other anatomy different from the adult population.
b. Learn about normal physical, mental, and behavioral development in the pediatric population.
c. Understand the role of somatic dysfunction in the pathophysiology of pediatric diseases including, but not limited to:
   i. acute and recurrent otitis media
   ii. asthma
   iii. torticollis
   iv. strabismus
   v. developmental delay
   vi. learning delay
   vii. seizure disorder
   viii. upper respiratory infections
   ix. scoliosis
   x. cerebral palsy
   xi. traumatic injuries
   xii. juvenile rheumatic diseases
   xiii. downs syndrome and other congenital abnormalities

d. Design a manipulative treatment program to address the structural considerations in the pediatric patient with a broad variety of disease processes, as part of the overall treatment plan.
Consultation and in-patient care should be performed on patients with a broad variety of diagnoses compatible with the educational objectives of the program and should not only address musculoskeletal complaints in medically ill patients. The resident should participate in all phases of the consultation, including patient evaluation, management including the delivery of osteopathic manipulative treatment, and writing of the consultation and follow-up notes.

The goals of this consultation service is for the resident to understand the role of NMM in the work-up and treatment of hospitalized patients with a broad diversity of illnesses and severity, and to develop the knowledge base to design osteopathic manipulative treatment plans to produce a physiological change in the hospitalized patient while refining palpatory and diagnostic skills to contribute to the work-up and care of the hospitalized patient.

The resident should work with an osteopathic neuromusculoskeletal consultation service while treating hospital in-patients. Over the course of the residency, the resident should be given greater responsibilities for the evaluation, treatment, and report of the consultation. There should be continuous interaction with attending physicians certified in the various specialty fields to reinforce the general medical and surgical care of the patient and the role of NMM/OMM in overall care of the patient. By the end of the program, the resident should have developed skills necessary to practice as an osteopathic neuromusculoskeletal consultant in a hospital service.
Conclusion

The post-graduate training of Osteopathic physicians in NMM has been a challenge within the Osteopathic community for many years. A limited number of dedicated training spaces and the required extra year of training have prevented many physicians from receiving additional education in NMM. These issues need to be addressed for Osteopathy to continue to promote NMM and to encourage Osteopathic physicians to achieve additional training in NMM.

This program seeks to address both issues by offering a certification track for those interested in training concurrently with their family medicine residency, as well as one for those who desire additional training in the post-residency setting. In addition, the emphasis track allows residents to sharpen their NMM skills during their family medicine residency while still completing it within three years. The emphasis program is unique in this aspect, and will allow physicians with time commitments (i.e., public health corp. or military) to complete their residency in their allotted time while sharpening their manipulative medicine skills.