Game of Bones: The Science and Strategy of Orthopedic Claims
Module 2: Spine

November 1, 2019
8:30 a.m. – 6:00 p.m.

The Hartford Club
Hartford, CT

CT Bar Institute, Inc.

CT: 7.25 CLE Credits (6.25 General; 1.0 Ethics)
NY: 8.0 CLE Credits (7.0 AOP; 1.0 Ethics)

No representation or warranty is made as to the accuracy of these materials. Readers should check primary sources where appropriate and use the traditional legal research techniques to make sure that the information has not been affected or changed by recent developments.
As a lawyer I must strive to make our system of justice work fairly and efficiently. In order to carry out that responsibility, not only will I comply with the letter and spirit of the disciplinary standards applicable to all lawyers, but I will also conduct myself in accordance with the following Principles of Professionalism when dealing with my client, opposing parties, their counsel, the courts and the general public.

Civility and courtesy are the hallmarks of professionalism and should not be equated with weakness;

I will endeavor to be courteous and civil, both in oral and in written communications;

I will not knowingly make statements of fact or of law that are untrue;

I will agree to reasonable requests for extensions of time or for waiver of procedural formalities when the legitimate interests of my client will not be adversely affected;

I will refrain from causing unreasonable delays;

I will endeavor to consult with opposing counsel before scheduling depositions and meetings and before rescheduling hearings, and I will cooperate with opposing counsel when scheduling changes are requested;

When scheduled hearings or depositions have to be canceled, I will notify opposing counsel, and if appropriate, the court (or other tribunal) as early as possible;

Before dates for hearings or trials are set, or if that is not feasible, immediately after such dates have been set, I will attempt to verify the availability of key participants and witnesses so that I can promptly notify the court (or other tribunal) and opposing counsel of any likely problem in that regard;

I will refrain from utilizing litigation or any other course of conduct to harass the opposing party;

I will refrain from engaging in excessive and abusive discovery, and I will comply with all reasonable discovery requests;

In depositions and other proceedings, and in negotiations, I will conduct myself with dignity, avoid making groundless objections and refrain from engaging in acts of rudeness or disrespect;

I will not serve motions and pleadings on the other party or counsel at such time or in such manner as will unfairly limit the other party’s opportunity to respond;

In business transactions I will not quarrel over matters of form or style, but will concentrate on matters of substance and content;

I will be a vigorous and zealous advocate on behalf of my client, while recognizing, as an officer of the court, that excessive zeal may be detrimental to my client’s interests as well as to the proper functioning of our system of justice;

While I must consider my client’s decision concerning the objectives of the representation, I nevertheless will counsel my client that a willingness to initiate or engage in settlement discussions is consistent with zealous and effective representation;

Where consistent with my client's interests, I will communicate with opposing counsel in an effort to avoid litigation and to resolve litigation that has actually commenced;

I will withdraw voluntarily claims or defense when it becomes apparent that they do not have merit or are superfluous;

I will not file frivolous motions;

I will make every effort to agree with other counsel, as early as possible, on a voluntary exchange of information and on a plan for discovery;

I will attempt to resolve, by agreement, my objections to matters contained in my opponent's pleadings and discovery requests;

In civil matters, I will stipulate to facts as to which there is no genuine dispute;

I will endeavor to be punctual in attending court hearings, conferences, meetings and depositions;

I will at all times be candid with the court and its personnel;

I will remember that, in addition to commitment to my client's cause, my responsibilities as a lawyer include a devotion to the public good;

I will endeavor to keep myself current in the areas in which I practice and when necessary, will associate with, or refer my client to, counsel knowledgeable in another field of practice;

I will be mindful of the fact that, as a member of a self-regulating profession, it is incumbent on me to report violations by fellow lawyers as required by the Rules of Professional Conduct;

I will be mindful of the need to protect the image of the legal profession in the eyes of the public and will be so guided when considering methods and content of advertising;

I will be mindful that the law is a learned profession and that among its desirable goals are devotion to public service, improvement of administration of justice, and the contribution of uncompensated time and civic influence on behalf of those persons who cannot afford adequate legal assistance;

I will endeavor to ensure that all persons, regardless of race, age, gender, disability, national origin, religion, sexual orientation, color, or creed receive fair and equal treatment under the law, and will always conduct myself in such a way as to promote equality and justice for all.

It is understood that nothing in these Principles shall be deemed to supersede, supplement or in any way amend the Rules of Professional Conduct, alter existing standards of conduct against which lawyer conduct might be judged or become a basis for the imposition of civil liability of any kind.

--Adopted by the Connecticut Bar Association House of Delegates on June 6, 1994
Game of Bones: The Science and Strategy of Orthopedic Claims (EWC191101)

Agenda

8:00 a.m. – 8:30 a.m.   Registration/Breakfast

8:30 a.m. – 8:35 a.m.   Introduction/Guiding principles

8:35 a.m. – 8:50 a.m.   Recent Developments in the Commission
   
   Chairman Stephen M. Morelli, State of Connecticut Workers’ Compensation Commission

8:50 a.m. – 9:00 a.m.   Introduction to Medical Program
   
   Dr. Pietro Memmo, Orthopedic Associates of Hartford

9:00 a.m. – 10:30 a.m.  Module 1: Wrist/Hand/Elbow
   
   Dr. Nicholas Bontempo, Orthopedic Associates of Hartford
   Dr. Kevin Burton, Orthopedic Associates of Hartford
   Dr. Andrew Caputo, Orthopedic Associates of Hartford
   Dr. Christopher Judson, Orthopedic Associates of Hartford
   Commissioner David W. Schoolcraft, State of Connecticut Workers’ Compensation Commission, Hartford
   Barbara J. Collins, Law Office of Barbara J. Collins, West Hartford
   Anne Kelly Zovas, Strunk Dodge Aiken Zovas LLC, Rocky Hill

10:30 a.m. – 10:45 a.m.  Break

10:45 a.m. – 12:15 p.m.  Module 2: Spine
   
   Dr. Gerald Becker, Orthopedic Associates of Hartford
   Dr. Vincent Codispoti, Orthopedic Associates of Hartford
   Dr. Sean Esmende, Orthopedic Associates of Hartford
   Dr. Stephan Lange, Orthopedic Associates of Hartford
   Dr. Pietro Memmo, Orthopedic Associates of Hartford
   Dr. Hanbing Zhou, Orthopedic Associates of Hartford
   Commissioner Maureen Driscoll, State of Connecticut Workers’ Compensation Commission, Hartford
   Robert Bystrowski, Morrison Mahoney LLP, Hartford
   Barbara J. Collins, Law Office of Barbara J. Collins, West Hartford

12:15 p.m. – 1:45 p.m.   Lunch
   
   Ethics Presentation 12:45 p.m. – 1:45 p.m.
   
   Dr. Stephan Lange, Orthopedic Associates of Hartford
   Dr. Michael A. Miranda, Orthopedic Associates of Hartford
   Commissioner Maureen Driscoll, State of Connecticut Workers’ Compensation Commission, Hartford
   Colin P. Mahon, Mahon Quinn & Mahon PC, Meriden
1:45 p.m. – 3:15 p.m.  Module 3: Shoulder
Dr. Christopher Lena, Orthopedic Associates of Hartford
Dr. James Mazzara, Orthopedic Associates of Hartford
Dr. Clifford Rios, Orthopedic Associates of Hartford
Dr. Kris Ware, Orthopedic Associates of Hartford
Commissioner David W. Schoolcraft, State of Connecticut Workers’ Compensation Commission, Hartford
Lori M. Comforti, Law Office of Lori M. Comforti LLC, Norwich
Anne Kelly Zovas, Strunk Dodge Aiken Zovas LLC, Rocky Hill

3:15 p.m. – 4:45 p.m.  Module 4: Knee
Dr. Christopher Lena, Orthopedic Associates of Hartford
Dr. James Mazzara, Orthopedic Associates of Hartford
Dr. Clifford Rios, Orthopedic Associates of Hartford
Dr. Kris Ware, Orthopedic Associates of Hartford
Commissioner Maureen Driscoll, State of Connecticut Workers’ Compensation Commission, Hartford
Robert Bystrowski, Morrison Mahoney LLP, Hartford
Lori M. Comforti, Law Office of Lori M. Comforti LLC, Norwich

4:45 p.m. – 6:00 p.m.  Cocktail Reception

**CLE Credit**
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Materials: ctbar.org/GameofBonesMaterials

WiFi

**Name:** THC

**Password:** marktwain
Faculty Biographies

Dr. Gerald Becker

Dr. Gerald Becker is an orthopedic spine surgeon who has practiced with Orthopedic Associates of Hartford since 1987. He received a B.S degree in Biophysics and Biochemistry from Yale in 1977. He received his M.D. degree from the University of Connecticut in 1981. Dr. Becker completed his Orthopedic residency at UConn in 1986 and a fellowship in Spinal Surgery at the University of Kansas in 1987.

Dr. Becker is an Assistant Clinical Professor or Orthopedics at UConn. He has been recognized in the publication Best Doctors in America over a dozen times. He has served on the Connecticut Workers Compensation Commission Medical Advisory Board since 2010 and served as co-chairman of the Spine Protocols Committee. Dr. Becker has been board certified in Orthopedics since 1990. His practice involves the treatment of traumatic and degenerative conditions of the neck and back.

Dr. Vincent Codispoti

Dr. Vincent Codispoti, M.D., is an Interventional Physiatrist who has been practicing in Connecticut since 2014.

Dr. Codispoti was born and raised in Brooklyn, NY. He obtained his Bachelor of Arts from Vassar College, where he majored in Economics and was elected to the Phi Beta Kappa Honor Society. He received his medical degree from New York University School of Medicine, and following graduation entered into active duty with the United States Army. He completed his Transitional Internship and residency in Physical Medicine and Rehabilitation at Walter Reed Army Medical Center. Upon graduation he was given the Jaqueline Perry Award as the most outstanding graduating resident in the Department of Orthopedics and Rehabilitation.

After completing his residency, Dr. Codispoti remained as a staff physiatrist at Walter Reed. During that time he served various roles, to include Director of Inpatient Rehabilitation, Director of Electrodiagnostic Medicine, and Associate Residency Program Director. He received the Gary Collins Golden Spoon Award as the staff member who best exemplified the role of teacher and healer, and the Helping Hand Award as the staff member who provided mentorship to the senior residents. He also completed a deployment to Iraq, providing medical care in support of Operation Iraqi Freedom. He was honorably discharged after eight years of service, and during his time on active duty received numerous military awards including multiple Army Commendation Medals, and the Meritorious Service Medal.

After leaving the Army, Dr. Codispoti began a one-year fellowship in Interventional Pain Management at Dartmouth Medical Center. He completed his fellowship in June 2014 and subsequently joined Orthopedic Associates of Hartford. His practice focuses on diagnosing and treating painful spinal conditions using conservative, non-operative techniques with minimal use of opioids. He is one of a select few physiatrists in the state who are triple-board certified in Physical Medicine and Rehabilitation, Electrodiagnostic Medicine, and Pain Medicine.

Dr. Sean Esmende

Dr. Sean Esmende is a board-certified fellowship trained orthopaedic spine surgeon specializing in treating a large variety of conditions of the cervical, thoracic, and lumbar spine. These conditions include degenerative
spinal disease, myelopathy, scoliosis, flatback syndrome, revision spine surgery, trauma, and oncologic disorders of the spine.

Prior to coming to Connecticut, he completed his undergraduate education at Cornell University and medical school at the University of California Los Angeles. He then completed his orthopaedic residency as well as an orthopaedic trauma fellowship at Brown University/Rhode Island Hospital. He completed his spine fellowship training at the University of Pittsburgh Medical Center.

He has numerous peer-reviewed publications, written textbook chapters about spinal disorders, and has presented at national and international spine meetings. Dr. Esmende has great interest in orthopedic training and currently serves at the Hartford Site Director for the University Connecticut Orthopedic Surgery Department. Dr. Esmende firmly believes in the art of medicine: correlating patient symptoms along with physical exam and study results. In other words, Dr. Esmende believes in treating the patient as a whole and not just the disease. Surgery is always the last resort after trying a full complement of conservative spinal care.

Dr. Stephan Lange

Dr. Stephan Lange has been affiliated with Orthopedic Associates of Hartford for over eight years. His main emphasis is spinal surgery and he performs cervical and lumbar surgery to include same day minimally invasive procedures, and cervical and lumbar fusion. With spinal fusions, he coordinates with Dr. Gerald Becker, an orthopedic spine surgeon also with Orthopedic Associates of Hartford, thereby providing patients with both neurosurgical and orthopedic expertise. Dr. Lange has been in practice in the Hartford area since 1984, having originally begun his practice with Neurosurgical Associates.

Dr. Lange’s practice also includes Respondent’s Medical Evaluations, medical chart reviews, and Commissioners Medical Evaluations. He has served on the Physicians Advisory Committee of the Connecticut Worker’s Compensation Commission for over 15 years.

Dr. Lange has been board-certified since 1984 in Neurological Surgery. He is a member of the American Association of Neurological Surgeons and the North American Spine Society.

Dr. Pietro Memmo

Pietro A. Memmo, MD, born in West Reading, Pennsylvania, graduated Summa Cum Laude from St. Charles Borromeo Seminary with a degree in Philosophy. Upon graduation, he moved to New York City, joining The Chase Manhattan Bank. He served as an officer of the Bank for over six years, managing corporate departments both domestically and internationally, and completed a one-year corporate finance training program.

Dr. Memmo completed all of his pre-medical studies with distinction at Columbia University and attended the Albert Einstein College of Medicine in the Bronx, New York. He completed his internship in Internal Medicine at Columbia-Presbyterian Medical Center, and his residency in Physical Medicine and Rehabilitation at the Kessler Institute for Rehabilitation and University of Medicine and Dentistry of New Jersey. While there, he was appointed Chief Resident, and was voted Resident Teacher of the Year. He also served as Resident Delegate to the American Medical Association. He completed his Fellowship training in Pain Management and Spine and Sports Medicine at Beth Israel Medical Center in New York City. While there, he was on the medical team for the New York Knicks.

Dr. Memmo is an Interventional Physiatrist, one of the few in the State of Connecticut who is Board Certified both in Physical Medicine and Rehabilitation and Pain Management. He joined Orthopedic Associates of
Hartford in 2003; current and prior leadership positions include: Executive Committee, Orthopedic Associates of Hartford; Assistant Medical Director /Medical Advisory Board, Orthopedic Associates Surgical Center; Associate Clinical Professor, Department of Orthopedics, University Connecticut School of Medicine; Service Line Director of Physiatry, Bone and Joint Institute; and former board member, Integrated Care Partners. The focus of his practice is to diagnose and treat painful spinal conditions in a conservative, non-operative fashion, with minimal utilization of narcotics. Dr. Memmo performs the most advanced, fluoroscopically-guided, minimally invasive spinal procedures at the Orthopedic Associates Surgery Center and the Bone and Joint Institute.

Dr. Hanbing Zhou

Dr. Hanbing (Steve) Zhou is a fellowship-trained orthopedic spine surgeon who cares for patients with surgical and non-surgical spine-related disorders. To treat these disorders, Dr. Zhou specializes in advanced minimally invasive and open surgical techniques. He believes in a comprehensive approach to patient care, including utilization of physical therapy and conservative management to explore all alternatives of treatment before surgery is considered. His clinical interests and expertise include degenerative cervical/thoracic/lumbar disease, adult deformity/scoliosis, spine oncology, and trauma. In addition, Dr. Zhou has a special interest in complex spine reconstruction including revision fusion surgery for nonunion, and proximal junctional kyphosis/failure.

Dr. Zhou completed his fellowship in spine from the prestigious Vancouver General Hospital in Vancouver, Canada. He finished his undergraduate education at University of California, San Diego in La Jolla, CA with a degree in biomechanical engineering. He earned his medical degree from Boston University in Boston, MA and went on to complete a six-year academic Orthopedic Surgery residency program at the University of Massachusetts Medical Center in Worcester, MA. In addition to the five-year clinical residency, Dr. Zhou also completed an additional year of orthopedic surgery research in the area of spine disorders. His efforts led to numerous publications and national presentations during his training. Dr. Zhou was also selected for the AOA Resident Leadership Forum during his residency training.

Dr. Zhou is dedicated to providing exceptional patient care with the highest level of compassion and expertise. He looks forward to helping you with your back-related problems.

Commissioner Maureen Driscoll

Commissioner Driscoll graduated from the University of Connecticut, cum laude, with a Bachelor of Arts in Political Science (1987). She received her Juris Doctor from Western New England College School of Law in 1990.

Prior to opening her own firm, Driscoll Law Offices, LLC, Commissioner Driscoll had practiced with Coles, O’Connell, Dolan and McDonald in Bridgeport and with Maher and Williams in Fairfield. Through the course of her practice of more than twenty-five years, Commissioner Driscoll handled primarily workers’ compensation and civil litigation claims. She has been a member of the Connecticut and Bridgeport Bar Associations for several years and was formerly co-chair of the CBA Young Lawyers Workers’ Compensation Section.

Commissioner Driscoll litigated a significant number of municipal claims in more recent years, including claims brought under the Heart and Hypertension Act. She was chosen as an expert legal advisor and manager of highly sensitive and ground-breaking workers’ compensation concerns relative to gun violence in the
workplace. She was also engaged in claims stemming from Sandy Hook. She practiced in all eight workers compensation districts in Connecticut.

Robert Bystrowski

Robert S. Bystrowski is a partner in the firm of Morrison Mahoney LLP in Hartford, Connecticut. Robert has more than twenty years of experience in civil litigation and trial practice in both the state and federal courts. He represents businesses, insurance companies, insureds and self-insured entities. Robert represents clients in a broad range of subject matters, including environmental and toxic torts, products liability, workers’ compensation and employment defense. He has successfully argued appeals before the Compensation Review Board, and state of Connecticut appellate and supreme court. He has authored a number of legal articles and regularly presents to bar associations, trade groups, businesses and claim administrators.

Barbara J. Collins

Attorney Barbara J. Collins is a solo practitioner in Hartford. A graduate of University of Connecticut and its Law School, and the NYS School of Industrial Relations at Cornell University, she has for over forty years represented labor unions, individual employees and multi-employer pension and health & welfare trust funds in labor and employment matters. Since 2000 she has also been an arbitrator and mediator in the labor and employment area.

Ms. Collins is a former President of the Connecticut Bar Association along with being a member and Chairs of the CBA Executive Board of the Human Rights and Responsibility, and the Labor and Employment Sections. She was on the House of the Delegates for the CBA for over ten (10) years, and presently is the Legislative Chair of the CBA Human Rights Section and on the Executive Boards of the CBA Workers' Compensation and Labor and Employment Sections. In addition, she is the former chair of the steering committee of the Labor and Employment Relations Association (Central Connecticut Chapter), a joint labor and management organization which sponsors approximately four lectures a year on topics of interest to labor and management. She is a member of the Connecticut Employment Lawyers Association. From 2000 to 2011 she was an arbitrator for the State of Connecticut Board of Mediation and Arbitration representing the interests of labor. In 2011 she was appointed to the Connecticut State Board of Labor Relations as one of three neutral Board members.

She has also served on the Board of the Law School of University of Connecticut Alumni Assn including one term as president. For the twelve years she was president of the Rockledge Women’s Golf Group in West Hartford and from Oct 2013 to October 2015 she was the president of the Southern New England Women’s Golf Association (SNEWGA). In addition, she is a Professional Ski Instructor Association certified ski instructor and for over ten (10) years ran the Weekend Children Ski Program at Ski Sundown, New Hartford, CT.
Spine Section

Dr. Hanbing Zhou: Spine Anatomy and Physical Examination
Dr. Vincent Codispoti: Non-operative Treatment of Spinal Conditions
Dr. Sean Esmende: Surgical Treatment of Cervical and Lumbar Radiculopathy
Dr. Stephan Lange: Patient Selection in Spine Surgery
Dr. Gerald Becker: Workers Compensation Ratings – the 5th and 6th Edition
Spine Anatomy and Physical Examination

Dr. Hanbing Zhou MD
Orthopedic Spine Surgery
Cervical Spine

<table>
<thead>
<tr>
<th>Joint</th>
<th>Bifid Spinous Process</th>
<th>Transverse Foramen / Vert?</th>
<th>Flexion/Extension</th>
<th>Rotation</th>
<th>Lateral Bend</th>
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<tbody>
<tr>
<td>Occiput-C1</td>
<td></td>
<td></td>
<td>50</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>C1 (Atlas)</td>
<td>None</td>
<td>Yes / Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C2 (Axis)</td>
<td>Yes</td>
<td>Yes / Yes</td>
<td>10</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>C3</td>
<td>Yes</td>
<td>Yes / Yes</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>C4</td>
<td>Yes</td>
<td>Yes / Yes</td>
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<tr>
<td>C5</td>
<td>Yes</td>
<td>Yes / Yes</td>
<td>50 (10/level)</td>
<td>50 (10/level)</td>
<td>60 (12/level)</td>
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<tr>
<td>C6</td>
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<td>Yes / Yes</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>C7 (VP)</td>
<td>No (95%)</td>
<td>Yes / No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Motion</td>
<td></td>
<td></td>
<td>110</td>
<td>100</td>
<td>68</td>
</tr>
</tbody>
</table>
MRI: Normal

MRI: Abnormal
• Symptoms
  • occipital headache (common)
  • trapezial or interscapular pain
  • neck pain
  • unilateral arm pain
  • unilateral dermatomal numbness & tingling
  • unilateral weakness

• Spurling test
  • simultaneous extension, rotation to affected side, lateral bend, and vertical compression reproduces symptoms in ipsilateral arm

Maximum Cervical Compression Test
Normal Lateral X-ray

Abnormal Lateral X-ray
MRI: Normal

MRI: Abnormal
Symptoms

- **axial back pain** (low back pain)
- **radicular pain** (buttock and leg pain)
  - often worse with sitting, improves with standing
  - symptoms worsened by coughing, valsalva, sneezing
- **cauda equina syndrome** (present in 1-10%)
  - bilateral leg pain
  - LE weakness
  - saddle anesthesia
  - bowel/bladder symptoms

Lower extremity dermatomes, myotomes, and reflexes

<table>
<thead>
<tr>
<th>Nerve Root</th>
<th>Sensory</th>
<th>Muscle</th>
<th>Tendon reflex</th>
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</thead>
<tbody>
<tr>
<td>L2</td>
<td>Anterior medial thigh</td>
<td>Hip flexor</td>
<td>None</td>
</tr>
<tr>
<td>L3</td>
<td>Anterior thigh to knee</td>
<td>quadriceps</td>
<td>patellar</td>
</tr>
<tr>
<td>L4</td>
<td>Medial calf/ankle</td>
<td>Anterior tibialis</td>
<td>Patellar</td>
</tr>
<tr>
<td>L5</td>
<td>Lateral ankle/ dorsum of foot</td>
<td>Extensor hallucis longus</td>
<td>None</td>
</tr>
<tr>
<td>S1</td>
<td>Plantar lateral foot</td>
<td>Gastrocnemius/ soleus/ peroneals</td>
<td>Achilles</td>
</tr>
</tbody>
</table>
Straight Leg Raise Test

- Tension sign for L5 and S1 nerve root
- Reproduces pain and paresthesia in leg at 30-70 degrees hip flexion
Non-operative Management of Spinal Conditions

Dr. Vincent Codispoti MD
Interventional Physiatrist
Treatment Goals

• **Diagnosis**
  - History
  - Physical Exam
  - Imaging and Diagnostic tests
  - Identify Pain Generator

• **Returning to Work**
  - Safely, Reasonably, Incrementally
  - 85-90% of patients with back pain will improve on their own without any treatment
Categories of Spine Pain

• **Mechanical**
  - Muscular/Soft Tissue (Strain)
  - Facet-Mediated
  - Sacroiliac Joint (SIJ)
  - Discogenic
    - Degenerative Disc Disease
    - Annular Tear

• **Neuropathic/Radicular**
  - Disc Herniation
  - Spinal Stenosis
  - Annular Tear/SIJ can mimic
General Approach

• Stay active, be proactive
• Physical Therapy
• Medications
• Injections
• Surgery
  • Progressive Motor Weakness
  • Bowel/Bladder Incontinence
  • Incapacitating Radicular pain despite non-operative treatment
Physical Therapy

• Goals
  • Lumbar Stabilization
  • Lower Extremity Stretching and Strengthening
  • Modalities
  • Assistive Devices
  • Transition to Daily Home Exercise Program
Medications

- **NSAIDs**
  - Ibuprofen, Diclofenac

- **Muscle Relaxants**
  - Methocarbamol, Baclofen

- **Neuropathic pain medications**
  - Gabapentin, Lyrica

- **Anti-Depressants**
  - Nortriptyline, Duloxetine

- **Topical**
  - Voltaren, Lidoderm

- **Opioids in rare situations**
Sample Approach

- **Mechanical Pain**
  - NSAIDs, Muscle Relaxants
  - Physical Therapy
  - Modalities, Bracing
  - Facet Injections/Medial Branch Blocks and Radiofrequency Lesioning
  - Sacroiliac Joint Injection

- **Radicular Pain**
  - NSAIDs, Muscle Relaxants
  - Physical Therapy
  - Additional Medications
    - Gabapentin, Nortriptyline
  - Epidural Steroid Injection(s)
  - Surgical Consultation?
Epidural Steroid Injections

• Studies show that radicular pain may be caused by inflammatory mediators
• Injection of cortisone into the epidural space
• Several mechanisms of action, generally reduce inflammation
• Goal: Decrease pain, move forward with physical therapy, exercise program
Epidural Steroid Injections (ESI)

• Used to treat radicular pain, pain related to spinal stenosis and degenerative disc disease
• Should be done under fluoroscopic guidance
• Different approaches
  • Interlaminar
  • Transforaminal
  • Caudal
Interlaminar ESI

• **Pros**
  • More general / Covers more areas
  • Only one needle

• **Cons**
  • Big needle
  • Chance of subdural injection
  • Less effective for radicular pain?
  • Can’t perform at level of previous surgery
Interlaminar ESI
Transforaminal ESI

• **Pros**
  - Can target specific nerve root
  - Spread to anterior epidural space
  - Very effective for radicular pain
  - Can be used post-surgery

• **Cons**
  - Technical
  - Not as effective for back pain?
  - Risk of neurologic injury*
Transforaminal ESI
Facet Joints

- Pain with standing, walking, extension based activities
- May radiate to hips, buttocks, legs
- Negative neurological signs
- Reproduction of symptoms with loading via extension with or without rotation
- Intra-articular Facet Injections
- Medial Branch Blocks/Radiofrequency
  - More reliable
  - Longer-term relief
Medial Branch Blocks

• **Two separate sets of blocks**
  • Patient maintains post-procedure pain diary
  • Goal is for 50-80% pain relief, improvement in function
  • Use different local anesthetics for each blocks
  • If two successful sets of blocks performed:

• **Proceed to Radiofrequency Ablation**
  • Thermal Coagulation of medial branches
  • Typical response 1 year or greater of relief from facet-mediated pain
Radiofrequency Lesioning
Sacroiliac Joint Pain

• Pain with standing, walking, activity
• Relief with rest
• May radiate to hips, buttocks, thigh, groin
• Negative neurologic signs
• Can occur with trauma
• Can mimic L5-S1 Disc issue
Sacroiliac Joint Pain
SUMMARY

• Assess, Diagnose, Identify the Pain Generator
• Mobilization, Physical Therapy, Medications, Modalities
• Radicular Pain: ESI
• Mechanical Pain: Facet Injections/Radiofrequency, SIJ injections

• Pursue surgical consultation if the patient has neurologic compromise or intractable pain that persists despite non-operative treatment

• Thank you!
Surgical Treatment of Cervical and Lumbar Radiculopathy

Dr. Sean Esmende MD
Orthopedic Spine Surgery
Objectives

- Understand origin of cervical and lumbar radiculopathy
  - Anatomy and Physical Exam
  - Imaging: X-rays and MRI
  - Non-operative management

- Pathology and Surgical Treatment
  - CERVICAL
    - Cervical disc herniation
      - Anterior cervical discectomy and fusion
  - LUMBAR
    - Disc herniation/stenosis
      - Discectomy/Decompression
    - Spondylolisthesis
      - Possible Fusion
CERVICAL RADICULOPATHY

MRI: Normal

MRI: Abnormal
CERVICAL RADICULOPATHY/STENOSIS

- Majority of patients respond to non-operative treatment

- Patient does not improve after 6-12 weeks

- progressive neurologic deficit

- Anterior cervical discectomy and fusion (ACDF) procedure most commonly performed for single/two level pathology

- Total Disc Replacement
Anterior Cervical Discectomy and Fusion
ACDF X-ray
ACDF Post-operative expectations

- Arm radiculopathy resolved immediately

- Dysphagia (difficulty swallowing/throat soreness)

- Same day vs overnight observation

- Limited lifting ability > 10-15 lbs 6-8 weeks

- RATING?
Cervical Total Disc Replacement
Lumbar Pathology
- stenosis
- disc herniation
- spondylolisthesis
LUMBAR Pathology

• Neurogenic Claudication
  • Pain in BOTH buttocks and thighs with EXERTION
  • Limited STANDING and WALKING
  • Burning pain/numbness/tingling
  • Relieved by rest/leaning forward

• Radiculopathy
  • ONE leg effected
  • Night pain
  • Positive Tension Signs
Normal vs Abnormal Lumbar X-ray
Normal vs Abnormal Lumbar X-ray

NORMAL

DISC DEGENERATION
Normal vs Abnormal Lumbar X-ray

NORMAL L4-5 listhesis (SLIP)
Normal vs Abnormal Lumbar X-ray

NORMAL

L4-5 listhesis (SLIP)
Normal vs Abnormal MRI

NORMAL

Lumbar STENOSIS
(narrowing)

Lumbar L4-5 listhesis
(SLIP)
Normal vs Abnormal MRI (disc herniation)
Normal vs Abnormal MRI spinal stenosis
How do you treat Lumbar stenosis and spondylolisthesis?

• ALWAYS conservative treatment to start:

  • Physical Therapy (4-6 weeks)
  • Anti-inflammatory and Muscle relaxants
  • Possible epidural steroid injections
Help Doctor, PT and injections aren’t working!

1. How much is this pain effecting your quality of life?
   - Time off work (TP or TT)
   - Household chores
   - Activities of daily living

2. How aggressive do you want to treat it?
   - Definitive vs temporize
Lumbar Disc herniation

- Lumbar Hemilaminotomy/Discectomy
  - Part of lamina removed
  - Disc fragment removed
  - Immediate radiculopathy pain relief
  - Outpatient/same day procedure
  - RATING?
Lumbar CENTRAL Stenosis with NO LISTHESIS

- Lumbar laminectomy/decompression
- Decompress spinal canal
- Neurogenic claudication pain relieved
- Outpatient/same day procedure
Lumbar Vertebral instability

- Spondylolisthesis
  - Anterolisthesis
  - Disc height
  - Presence of facet fluid
  - Facet orientation (sagittal)

- FUSION
  - Pedicle Screws/Rods
  - Interbody Spacer
Post-operative expectations

• Inpatient stay – 1-2 nights
• Decrease in leg pain noted immediately
• Physical therapy assessment
• Start home exercise WALKING regimen immediately
  • At 2 weeks start recumbent bike
• No heavy lifting > 10-15 lbs for 6-8 weeks
• No Extreme bending, lifting, twisting
Treatment outcomes for fusion

• Fusion for patients with listhesis
  • Less leg

• Less back pain

• versus decompression alone for listhesis
  • RATING for single level fusion?
Robotic Spine Surgery

- **PERSONALIZED** screw placement
  - Obtain accurate starting point
  - Based on low dose CT scan
  - Adds minimal time in the OR
Robotic Spine Surgery
Patient Selection

So many positive MRI’s,
So many toys to treat them with....

Spine surgery a technical success but
a Clinical Failure
Positive Lumbar MRI in Asymptomatic Individuals

Abnormal Lumbar MRI-
37% at 20 years old, increasing to 96% at 80 years
Large increase in prevalence through 50 years
Disc signal loss in over half of 40 y/o and in 86% of 60 y/o
Spondylolisthesis, 23% at 60 y/o
Disc Protrusion, 29% in 20 y/o, not increasing with age
Positive Cervical MRI in Asymptomatic Individuals

Disc degeneration, herniation, narrowing of disc space or foraminal stenosis

17% men and 12% women in 20’s
86% men and 89% women over 60 y/o

7.6% Asymptomatic spinal cord compression
“19 spine, orthopedic device companies to impact the industry in 2018”
M. Garrity, Becker’s Spine Review, January 22, 2018

Alphatec
Arthrex
Camber Spine
DePuy Synthes
Exactech
Globus Medical
Implanet
Intuitive Surgical
K2M
Mazor Robotics
Medtronic
NuVasive
OrthoPedicatrix
Smith&Nephew
SpineGuard
Stryker
Titan Spine
Xenco
Zimmer Biomet
Goals of Elective Spine Surgery

Repair injured or diseased structure in spine

Reduce pain

Improve the patient’s ability to function
Surgical Decision in Patient’s Care

Traditional-
   History, Physical, and Radiographic Studies drive a clinical decision

Work Related Injury
   The above and...
Multiple other, non traditional issues that can either help or impair the patient having a good clinical outcome despite a presumed good surgery
Medical Risk of Adverse Outcome

- Type of surgery. Laminectomy vs. Fusion.
- Pain Duration. Years vs. months
- Number of prior spine surgeries
- Multiple medical problems
- Smoking. Increased risk of back pain and degeneration of cervical and lumbar spine
- Obesity. Increased morbidity of surgery, greater risk of infection, pneumonia, pulmonary embolus, and slower recovery.
“The success of many surgical procedures depends not only on the skill of the surgeon and the use of state of the art technology, but also on the actions and characteristics of the patient.”
Psychological Risk Factors for Good Outcome

• Depression. Emphasis on the negative outcome of both the injury and the treatment for that injury.

• Anxiety. Excessive anxiety, fear of re-injury, adverse effect on outcome (spinal pain patients with both anxiety and depression have a 62% worse return to work rate than those with no psychopathology)

• Pain Sensitivity. The extent that a patient focuses on pain symptoms in excess of that expected for a particular physical condition

• Catastrophization. The injury is the beginning of an unending series of worsening events
Negative Historical Factors

Long term narcotic use vis a vis postoperative pain control and recuperation

Long history of psychiatric problems may increase the stress of surgery and impair recovery

(85% failure rate of spine surgery among patients with a significant history of childhood abuse and abandonment)
Reinforcement for Staying Sick

Intentional or unintentional reinforcement of pain behaviors increases the likelihood that the patient will continue to show and experience pain.

- Over solicitous partner or family members (supporter or enabler?)
- Over solicitous worker’s compensation case worker?
- Overly “generous” disability from employer?

Litigation.

- WC, WC with Attorney

Prolonged disability.

- Patients who are working at time of surgery have a 10 times greater likelihood of working at 1 year follow up than those not working at time of surgery.
Preoperative Consideration for a Good Worker’s Comp Spine Surgery Result

- The Complaints, Exam and Radiographic findings are consistent
- The patient has attempted Conservative care without relief AND
- The patient is stable psychiatrically
- Narcotics are not abused
- Non smoker
- BMI
- Interest in returning to work
- Supportive Family and Employer
CONCLUSION

Presume that all spine surgeons have a technically good result

However, Good in, is Good out

The overall result of the care rendered is strengthened when the treating physician is attentive for possible nonsurgical factors that can either contribute to, or impair a good clinical outcome.
AMA Rating Guidelines: 
5th vs 6th Edition

Dr. Gerald Becker MD 
Orthopedic Spine Surgery
AMA Guides

• First Edition – 1971
• Second Edition - 1984
• Third Edition – 1988
• Fourth Edition – 1993
• Fifth Edition – 2000
• Sixth Edition – 2007
• Seventh Edition - ?
5th vs 6th Edition

• Ratings lower in the 6th Edition
• 6th Edition is more complicated and difficult to use
• 6th Edition is more reliable, takes ADL’s into account
• Both use conversion factors for regional impairment
One-Level Lumbar Fusion

• Fifth Edition - DRE Cat IV 20-23% WPI
• Sixth Edition – Motion Segment Lesion Class II 10-14% WPI (modified by functional, physical, clinical study adjustments which are well-defined)
Fourth Edition: Injury Model

- Table 73 DRE Cervicothoracic Spine Impairment Categories (4th ed, 110)
- Category III = 15% WPI

"With the Injury Model, surgery to treat an impairment does not modify the original impairment estimate, which remains the same in spite of any changes in signs or symptoms which follow the surgery and irrespective of whether the patient has a favorable or unfavorable response to treatment" (4th ed, 100)
Fifth Edition: Diagnosis-Related Estimates Method

- Table 15-5 Criteria for Rating Impairment Due to Cervical Disorders (5th ed, 392)
- DRE Cervical Category IV = 25% - 28% WPI
- Favorable outcome = 25% WPI
- Multilevel fusions rated via Range of Motion Method
One-Level Cervical Fusion

Chris Brigham MD - May 17, 2016

Sixth Edition:
Diagnosis-Based Impairment

- Table 17-2 Cervical Spine Regional Grid
- Category: Motion Segment Lesions / Intervertebral disk herniation and/or AOMSI
- Class 1
- Default Impairment: 6% WPI

CLASS 1

4 5 6 7 8
Intervertebral disk herniation or documented AOMSI at a single level or multiple levels with medically documented findings; with or without surgery

and

for disk herniation with documented resolved radiculopathy or nonverifiable radicular complaints at the clinically appropriate levels present at the time of examination
NCCI -2012

• Compared average impairment ratings in states that did not switch from 5\textsuperscript{th} to 6\textsuperscript{th} Edition to those that did

• Georgia and Kentucky – 5\textsuperscript{th} Ed.

• Montana, Tennessee, New Mexico changed to 6\textsuperscript{th} Edition
5th Edition only 2007-2008

- Kentucky – 5.3%
- Georgia – 12.7%
- Economic factors due to recession skewed results to lower numbers
Change to 6th Ed. 2007-2008

• Montana – 27%
• Tennessee – 25%
• New Mexico – 32%
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>All</td>
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<tr>
<td>Spine</td>
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<tr>
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<td>57</td>
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<td>3.2%</td>
</tr>
<tr>
<td>Nonsurgical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spine</td>
<td>71</td>
<td>3.5%</td>
<td>3.8%</td>
<td>3.0%</td>
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<tr>
<td>Upper extremity</td>
<td>66</td>
<td>2.0%</td>
<td>2.2%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>20</td>
<td>3.0%</td>
<td>3.2%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Surgical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spine</td>
<td>15</td>
<td>13.3%</td>
<td>20.1%</td>
<td>9.5%</td>
</tr>
<tr>
<td>Upper extremity</td>
<td>60</td>
<td>4.4%</td>
<td>4.7%</td>
<td>3.8%</td>
</tr>
<tr>
<td>Lower extremity</td>
<td>37</td>
<td>4.6%</td>
<td>4.5%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>
Whole Person Impairment

• Much larger issue
• Connecticut is the only state that does not use this standard per Dr. Brigham
• Why is this a problem? – Conversion factors do not make logical sense
Regional Impairment

• Cervical  20%/0.35 = 57%
• Thoracic  20%/0.2 = 100%
• Lumbar  20%/0.75 = 27%
From: Chris Brigham [mailto:chris@cbrigham.com]
Sent: Tuesday, October 17, 2017 9:34 AM
To: Jim Talmage; Marjorie Eskay-Auerbach, MD, JD; bobharalson@icloud.com
Cc: gbecker@oahctmd.com
Subject: Origin of conversion values in the Guides for converting spine WP ratings to regional ratings?

Hi,

An interesting question below. What was the basis for the conversion factors used to convert WP ratings of the spine to regional spine impairments (cervical, thoracic and spine)? Your guidance would be great. Only Connecticut uses this.

Thanks,

Chris

Christopher R. Brigham MD, MMS, FACOEM, FIAIME
Response from Dr. Talmadge

The 6th Edition restates the conversion factors for just the previous Injury method as the conversion factors to use for the 6th Editions diagnosis based system. Margie may remember why one set of conversion factors was preferred over the other. Clearly dividing the cervical spine rating by 0.35 or the thoracic spine rating by 0.2 seems to over-rate those disorders in Connecticut. Thus the origin of the conversion factors that seem to over-rate the cervical and thoracic spine stems from the discussion immediately prior to publication of the 4th Edition in 1993.
Conversion Factors

• Nobody knows who derived them
• Nobody knows how they were derived
• There is some consensus that they are not fair
Response from AMA

• **From:** Nancy Baker &lt;Nancy.Baker@ama-assn.org&gt;  
  **Date:** July 5, 2018 at 2:47:59 PM EDT  
  **To:** "gbecker@oahctmd.com" &lt;gbecker@oahctmd.com&gt;  
  **Subject:** AMA Guides to the Evaluation of Permanent Impairment

• Good afternoon Dr. Becker,

• Thank you for your inquiry regarding the *AMA Guides to the Evaluation of Permanent Impairment*, 6th edition. Your concern about the cervical and thoracic WPI to regional impairment has been noted and archived. It will be addressed when the AMA decides to publish a seventh edition of the text.

•

• Thank you,
Where do we go from here?

• No Guideline is mandated
• Ratings should be justifiable and fair
• Ratings should conform with what is commonly accepted by reasonable spinal surgeons
What is acceptable for cervical and lumbar ratings?

- Soft tissue injury: 5%
- Disc herniation: 10%  Surgery: 10-15%
- Fusion: 20%  2 Level: 25%
- Additional levels: 3-5%
• Claimant is a 59 year old factory worker who works as a pressman. On August 5, 2018, while at work, the claimant’s CNC machine jammed during production. He attempted to fix the jam by lifting up a corner of the machine and felt an immediate pain in his low back as well as pain in his left buttock and leg. The claimant was involved in a motor vehicle accident at age 45 where his car was rear-ended by a negligent driver. He injured his back as a result of that motor vehicle and received money from a lawsuit against the negligent driver. At the time of the motor vehicle accident, the claimant suffered from pain down his right leg which he claims resolved about 2 to 3 years after accident. There are no records available from the incident when he was 45.
• **QUESTION 1:**

What do doctors do when no records exist from prior injuries? How does that impact a case, if at all?
• Claimant is diagnosed with a left-sided herniated disc superimposed upon moderate degenerative disc disease and stenosis. After conservative measures fail, he is recommended for an L4-L5 fusion. The fusion is approved by workers’ compensation and the claimant undergoes surgical procedure. Post-surgery, the claimant improves dramatically; however after two months of gentle stretching and light activity, he reports a sharp increase in his pain, return of the radiculopathy in his bilateral legs. He complains bitterly of pain.
• QUESTION 2:
Is the claimant’s need for treatment work related? What factors are considered (physical findings, MRI’s, other objective subjective factors)?
• **QUESTION 3:**

Do you need the information on the prior injury to answer question 2?

Why or why not?
• **QUESTION 4:**
  What could be causing the increase in pain described by the patient?

• **QUESTION 5:**
  What role is the underlying degenerative disease and narrowing playing in this situation?
• **QUESTION 6:**

Does this patient suffer from chronic pain?

What modalities are available to treat him?

ESI TPI MBB RFA?
• After the increase in pain, claimant responds well to a course of steroids, and soothing ultrasound heat and ice at formal PT. He is feeling better and is now five (5) months post-surgery. Claimant’s job requires that he be able to lift 35 pound materials on a frequent basis and that he be able to lift items weighing 50 pounds occasionally.

• He is rarely allowed to sit during the course of his job and must walk the floor of the factory to obtain materials and pushcarts with the materials on them at least twice per day. His job also requires cleaning the machine before leaving for the day which involves bending and twisting to reach areas of the machine that are hard to access.
• **QUESTION 9:**
  Can the claimant return to work?

• **QUESTION 10:**
  What will you look for to return him to sedentary work? Light work? Regular duty? How do you define these terms?
• **QUESTION 11:**
  Would you offer options of FCE, work conditioning programs?

• **QUESTION 12:**
  Will the claimant be able to return to work full duty?

• **QUESTION 13:**
  When will the claimant be expected to reach MMI?
  Will the prior injury play a role when you issue a rating for this claimant?
• **QUESTION 14:**

What would you anticipate his rating to be?
• Claimant tries to return to work sedentary duty with a 10 pound, lift, push, pull, restriction after seven (7) months post-surgery and is unable to work a full 8 hour shift due to pain.

• His complaints continue including radiculopathy. He is referred for ESI’s. The first set of injections give him immediate relief.

• **QUESTION 15:**

  Is this chronic pain? How do you assess this diagnosis?
• **QUESTION 16:**
What’s next for this patient?

• **QUESTION 17:**
If the injections work, for how long may the claimant need them? What is reasonable or necessary and likely to be recommended?

• **QUESTION 18:**
Alternately, the claimant gets no relief from the injections, from medication management, and is not a surgical candidate. He suffers from moderate constant pain, will his rating include a percentage for chronic pain?
• Question: What other pain management options may be available for this claimant. MBB’s RFA/N? Spinal Chord stimulator?
• Claimant’s injury is to the cervical spine. He has had a two (2) level fusion at C4-5 and C5-6. He has severe pain down his arm which turns purple in the cold and has reduced sensation over the forearm.

• **QUESTION 19**: Is the claimant suffering from RSD or CRPS?

• **QUESTION 8**: Is CRPS over diagnosed? What findings are considered medically diagnostic for CRPS diagnosis, when is it found? This question belongs at the bottom as new question #20.
QUESTION 21:
What is the future exposure for this injury with a CRPS diagnosis?