

International Spine and Pain Institute (ISPI)

Fellowship in Pain Sciences

Curriculum 2018

ISPI Fellowship in Pain Sciences Program

Program Director: Dr. Adriaan Louw PT, PhD, CSMT

Given the current pain and opioid epidemic and growing awareness regarding the complexity of persistent pain, there is a significant need for advanced, non-pharmacological treatment of pain. As in medicine, the need to train a specialized subgroup of clinicians to utilize advanced skills necessitates advanced training, including fellowship level.

The ISPI-EIM pain fellowship is an 18-month plan of study blending various pain science content via online and onsite (blended) formats. This fellowship has been designed to allow working clinicians to enroll and complete an advanced level of training, yet continue with their professional and personal lives. Lectures, readings and articles are recorded and provided on an online platform, allowing students to complete didactic content from their home. This allows weekend lab-intensive classes to focus more on the hands-on (psychomotor) skills and help cut cost (travel and accommodation) in comparison to traditional weekend classes combining didactic and lab sessions.

Program Highlights:

1. The latest pain neuroscience related to the human pain experience
2. Clinical application of pain science including assessment and treatment
3. Advanced clinical reasoning in the bio-psycho-social model
4. Multidisciplinary and interdisciplinary care for pain

Admission Requirements

1. All fellows must possess a current and valid license to practice in their respective profession. This license must not be under suspension, revocation, probationary status, or subject to disciplinary proceedings or inquiry.
2. If English is not the applicant's native/first language, the language of common use in clinical practice, or language used in the applicant's physiotherapy professional education, specified language proficiency requirements may be required.
3. All fellows must have current CPR certification.
4. Fellows must obtain additional coursework in the area of evidence-based practice if the EIM Fellowship Program determines that the applicant's background in this area is insufficient.
5. Fellows must obtain (2) letters of recommendation.
6. Successful completion of TPS curriculum, with 90% or higher achieved in each course.

Curriculum

The ISPI Fellowship in Pain Sciences Program consists of 33 total credit hours of hybrid online and onsite learning. The student has 3 years (36 months) of active enrollment to complete the program. The curriculum consists of the following academic courses:

Therapeutic Pain Science Coursework

(Students are required to complete the TPS curriculum before starting the Fellowship coursework)

ISPI-TPS 6410	Therapeutic Neuroscience Education
ISPI-TPS 6100WI	Weekend Intensive I Graded Motor Imagery and Neurodynamics for People in Pain
ISPT-TPS 6110WI	Weekend Intensive II Advanced Therapeutic Neuroscience Education: Focus on Function
ITPI-TPS 6151A	Neurodynamics I
ISPI-TPS 6152	Too Hot to Handle
ISPI-TPS 6151B	Neurodynamics II
ISPI-TPS 6154	Everything Hurts
ISPI-TPS 6156	Business of Chronic Pain
ISPI-TPS 6155	Perioperative Neuroscience Education
ISPI-TPS 7180	Cumulative Capstone Examination

Credits: 13

Core Fellowship Coursework

PNEF 6410	Special Topics in Pain Neuroscience Education
PNEF 6410WI	Special Topics in PNE Weekend Intensive
RES 6110	Writing Case Reports & Case Series
PNEF 6110	Multidisciplinary and Interdisciplinary Approach to PNE
PNEF 6420	Advanced Clinical Practice
PNEF 7570	PSF Virtual Rounds
PNEF 6410TA	Teaching Assistant Role- Therapeutic Neuroscience Education
RES 7280	PSF Scholarly Project
PNEF 7190	Fellowship Mentored Clinical Practice
PNEF 7210WI	Capstone Weekend Intensive

Credits: 20

Total Credits: 33

ISPI 6410 Therapeutic Neuroscience Education**4 credits**

Teaching people about pain can have a therapeutic effect. This course is designed to update attendees on the latest evidence and clinical application of therapeutic neuroscience education for patients in pain. Current best evidence has shown that neuroscience educational strategies utilizing neurobiology and neurophysiology are able to reduce pain, increase function, reduce fear and catastrophization, improve movement and change cognitions and brain activation during pain experiences. Therapeutic neuroscience education changes patient beliefs regarding their pain, thus reducing the threat of pain. This course will discuss the evolution of therapeutic neuroscience education, why neuroscience education is needed in patient care and, more importantly, the clinical application and implementation of therapeutic neuroscience education for patients with acute, sub-acute and chronic pain. Special features include various metaphors, images, examples and case studies explaining neuroscience to patients in pain. In addition, the class will cover clinical issues such as compliance, pacing exercise and activity, incorporation of therapeutic neuroscience education with traditional movement-based therapy, billing and insurance reimbursement concerns and delivering therapeutic neuroscience education in busy, time-constrained clinical environments.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Discuss the latest evidence for therapeutic neuroscience education
2. Demonstrate the clinical ability to apply therapeutic neuroscience education to clinical practice with the use of at least one metaphor shared in class
3. List at least half of the output systems discussed in class and their response in a chronic pain patient
4. List potential strategies to implement therapeutic neuroscience into clinic practice regarding time, staff, billing and traditional therapeutic treatments
5. Design a treatment plan for a chronic pain patient based on output system dysfunctions with correct pain neurophysiological reasoning behind the treatment with information provided in the course

ISPI 6151a/b A Study of Neurodynamics I & II**2 credits**

This two-part course is designed to update participants on the latest evidence and clinical application of neurodynamics. Neurodynamics is the physical ability of the nervous system to move, slide, glide and accommodate human movement and function. Compared to more traditional manual therapy models focusing on joints and muscles, neurodynamics is new and vitally important in restoring normal movement and function. To understand the physical movement of nerves, neuroscience knowledge is explored to understand how pain works from a neurobiological and neurophysiological perspective. This course will discuss the latest research in the use of neurodynamic tests for examination as well as treatment. Mounting evidence supports the use of neuro-dynamics in various traditional orthopedic based disorders such as low back pain, radiculopathy, plantar fasciitis, lateral epicondylitis, whiplash associated disorders, neck pain, carpal tunnel, post-surgery, ankle sprains and more. The didactic coursework will prepare attendees for the weekend intensive lab sessions. Following the lab session on the weekend intensives, the course will conclude with the clinical application of the neurodynamic tests and treatments associated with the course. This course adds the important handling skills component for healthcare providers treating patients with pain.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Review current evidence and understanding of neuroanatomy and neurogenic pain related to evaluation and treatment of neurodynamics through attending lecture and reviewing course manual
2. Develop a clinical working knowledge of neurodynamics
3. Develop an understanding of the importance of physical testing and handling of people in pain
4. Be updated on the latest evidence, both biological and clinical trials, of neurodynamic tests and treatments in a variety of pain-related conditions
5. Differentiate neurodynamic treatment principles for various clinical examples based on lecture material and course manual in class discussion
6. Merge neurodynamic information and concepts into other paradigms of examination and treatments of musculoskeletal conditions
7. Develop a base knowledge of neurobiology to allow for practical tests, examination and treatments in weekend intensive lab sessions

ISPI 6152 Too Hot to Handle

1 credit

Many patients seeking help for pain are simply “too hot to handle.” Modern pain science refers to this as allodynia and/or hyperalgesia. Nowhere is this more evident than Complex Regional Pain Syndrome (CRPS). Using CRPS as a template, this course will feature various aspects of CRPS including differences between CRPS 1 and CRPS 2, clinical presentation and diagnosis, current epidemiological factors and risks associated with the development of CRPS to discuss hyper-sensitization of the nervous system. In the last 10 years, knowledge of hypersensitization, including CRPS, has increased rapidly leading to new advances in physical treatment. Now patients with hypersensitization can not only be managed but treated effectively and returned to normal function. In addition, the three main pathobiological processes currently thought to be the main issues with CRPS, and general hypersensitization, will be discussed. These are aberrant inflammatory mechanisms, vasomotor issues and neuroplastic changes in response to pain. This class will feature an extensive review of treatments based on the latest evidence for treating patients with CRPS and hypersensitization. Included are graded motor imagery, sensory discrimination, graphesthesia and neuroscience education. Various examination and treatment techniques will be discussed allowing preparation for the weekend intensive lab sessions. This course is particularly beneficial for healthcare providers working in a variety of clinical settings dealing with CRPS or any patients displaying a heightened sensitization to physical movement and handling.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Understand the pathobiology of the development of hypersensitization in chronic pain
2. Recognize the current criteria for the diagnoses of CRPS
3. Identify bio-psycho-social factors associated with the development of hypersensitization
4. Be updated on the latest evidence-based approaches for managing patients with hypersensitization
5. Apply the information from the educational session into clinical practice
6. Increase sensory discrimination and proprioception to restore sensory and motor mapping
7. Develop a base knowledge of hypersensitization to allow for practical tests, examination and treatments in weekend intensive lab sessions

ISPI 6100WI I: Graded Motor Imagery and Neurodynamics for People in Pain 1 credit

This lab-intensive weekend course will equip health care providers with the didactic knowledge and hands-on skills needed for treating patients suffering from peripheral neurogenic pain and a variety of nociplastic pain states.

Students will be provided with mandatory pre-course viewing (2.5 hours) and reading materials to establish the foundation necessary to participate in this lab-intensive weekend. They will demonstrate competency through a quiz for Neurodynamics and a quiz for GMI. Pre-course work will promote appropriate background, rationale, and clinical decision-making considerations for implementation of the techniques covered. For those students enrolled in the TPS program, this weekend intensive serves as the practical application of the Neurodynamics and Too Hot to Handle courses.

On day 1, attendees will practice and develop skills in the physical examination and treatment of a sensitized peripheral nervous system. Practical sessions focus on the main upper extremity nerves (median, radial and ulnar), trunk, head and lower extremities, including both lumbar and lumbosacral plexuses and tracts. Practical sessions include identifying and palpating peripheral nerves, active and passive neurodynamic tests, and neurodynamic treatments for the sensitive nervous system. Safe and appropriate patient handling will be emphasized.

Day 2 focuses on desensitization of the nervous system, i.e. patients suffering from nociplastic pain. First, attendees will review easy-to-follow strategies to teach people about pain and neural sensitivity related to central sensitization. This practical application of TNE will prepare patients for novel treatments aimed at desensitization of a hyper-sensitive nervous system. Attendees will then learn to test various aspects associated with sensitization, including laterality, two-point discrimination, body diagram drawings, localization of stimulus and graphesthesia. Treatments will include retraining left-right discrimination, motor imagery/visualization, localization, sensory discrimination, graphesthesia and mirror therapy.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Locate and palpate peripheral nerves in upper and lower extremities on lab partners using course manual and with instructor assistance
2. Demonstrate upper limb, trunk, lumbar and lumbosacral neurodynamic tests performed on lab partners after demonstration from instructor(s) and with use of manual
3. Demonstrate upper limb, trunk, lumbar and lumbosacral neurodynamic treatments performed on lab partners after demonstration from instructor(s) and with use of manual
4. Choose appropriate neurodynamic tests and treatments for clinical application to at least 1 of 8 written case studies presenting to class for discussion using course teachings and course manual
5. Practice and demonstrate an ability to explain nerve sensitization to patients in pain
6. Skillfully perform sensorimotor testing of hypersensitization on lab partners using course manual and with instructor assistance

ISPI 6154 Everything Hurts

1 credit

Many chronic pain sufferers are diagnosed with widespread, diffuse, and non-specific pain in conditions like fibromyalgia, chronic fatigue syndrome, metabolic disorder and Lyme disease. Current neuroscience is pointing a shared mechanism of brain processing (pain neuromatrix) and significant alterations in biological systems such as the immune and endocrine systems in these patient populations. Collectively,

these conditions affect approximately 5% of the population - or more than 15 million Americans. Research has shown that treatments such as cardiovascular exercise, strengthening exercise, membrane stabilizing drugs and education (especially cognitive behavioral therapy) is helpful in treating widespread pain. But how does it work? How can therapy help patients with widespread pain? This class will discuss the epidemiology and etiology of conditions like fibromyalgia as well as the current medical model for treating widespread pain and especially the deficiencies in this model. The class will focus on the new neuroscience view of widespread pain, including the brain's processing of pain, nerve sensitization, neuroendocrine and immune changes in response to pain, changes in motor function, sleep and more. Evidence-based treatments such as therapeutic neuroscience education, aerobic exercise, pacing, graded exposure, goal setting and various other strategies such as relaxation, breathing and sleep hygiene will be discussed in patients with widespread pain.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Be updated on the latest evidence for treating widespread pain
2. Develop a greater understanding of the neuroscience, neuroendocrine and immune changes associated with widespread pain
3. Explain widespread pain to patients utilizing therapeutic neuroscience education
4. Develop a comprehensive movement, pacing and graded exposure treatment plan for patients with widespread pain
5. Apply all strategies and knowledge to clinical practice.

ISPI 6101WI Advanced Therapeutic Neuroscience Education: Focus on Function 1 credit

In recent years, therapeutic neuroscience education (TNE) has gained considerable evidence and clinical popularity. Current best-evidence shows that pain neuroscience education improves pain ratings, function, pain catastrophization, physical movement and cost of healthcare utilization. Clinically there is a shift whereby more and more clinicians are gaining experience in teaching people more about pain.

Basic application of TNE in the clinic is a good starting point, but it is not the end-point for most patients. The ultimate expression of recovery is behavior change: return to physical confidence. For many patients, some pain will continue to be a part of life, but it doesn't need to rule their lives. In order to help patients move forward *despite their pain*, clinicians need to embrace and impart additional strategies such as goal setting, pacing, graded exposure and behavioral change. These strategies lead to functional, empowered patients being able to resume fulfilled, meaningful lives. This course bridges the gap from initial pain education to independence.

Through pre-conference material, lectures, case studies, group sessions, clinical application and motivational interviewing, clinicians will develop skills aimed at true behavioral change.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Advance their knowledge and clinical ability to perform therapeutic neuroscience education
2. Problem solve various barriers to reconceptualization regarding therapeutic neuroscience education
3. Utilize motivational interviewing and goal setting to develop a structured plan of care to foster behavioral change
4. Develop and implement pacing and graded exposure of various daily activities and exercise for people with persistent pain

5. Identify, discuss and address issues related to fear-avoidance and kinesiophobia for people recovering from pain-related fear and limited function
6. Develop strategies to apply course material into clinical practice

ISPI 6155 Perioperative Therapeutic Neuroscience Education 1 credit

Spinal surgery and knee replacements in the US are increasing. Outcome data indicates nearly 40% of patients experience persistent pain and disability following lumbar surgery. Postoperative rehabilitation following lumbar surgery has shown little efficacy in decreasing postoperative pain and disability, and it has been shown that patients are typically not sent to physical therapy following lumbar surgery. For knee replacements, recent studies have highlighted the issues of central sensitization associated with knee arthritis and knee replacement, which has pain scientists now developing a similar pain-science approach to knee replacements. This course class will examine lumbar surgery and knee replacements from a neuroscience perspective, including why so many patients suffer with pain after surgery, patient beliefs about surgery, and how surgeons prepare patients for surgery. This class will feature an extensive neuroscience education section, which will help patients prior to surgery, immediately post-op and subsequently in the acute and sub-acute postoperative phase. Preoperative education has shown some effect in altering anxiety, stress and fear associated with surgery. This preoperative neuroscience education program created by physical therapists has recently been developed and has not only shown immediate post-education improvements in psychometric measures, beliefs and expectations for surgery and physical movements, but also a significant reduction of brain activity associated with painful tasks in patients scheduled for lumbar surgery. Additionally, preoperative neuroscience education has shown superior outcomes following surgery compared to patients receiving traditional surgeon led education related to back pain, leg pain, fear, catastrophization, function and postoperative healthcare utilization.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. List two reasons why a new bio-psycho-social treatment approach is needed to address pain in lumbar surgery and knee replacements.
2. Define the steps in the development and validation process of the preoperative neuroscience education program for lumbar surgery patients and now knee replacements.
3. Articulate the use of the content and delivery methods for the preoperative neuroscience educational program for use with preoperative lumbar surgery patient during the clinical application time in class.
4. Articulate the use of the content and delivery methods for the preoperative neuroscience educational program for use with preoperative knee replacement patient during the clinical application time in class.
5. Restate the general findings of the research showing preoperative neuroscience educational treatment program produces superior results to the biomedical model utilized by US spine surgeons for patients undergoing lumbar surgery.
6. Integrate the majority of the concepts from the therapeutic neuroscience educational session into clinical practice to fellow participants utilizing case scenarios.

ISPI 6156 Business of Chronic Pain 1 credit

This course combines two worlds – pain science and business. It is estimated that more than 80 million Americans are affected by some form of chronic pain. This number is ever increasing. This increase of chronic pain is associated with increased utilization of healthcare dollars and added burden on healthcare providers, including physical therapists. All of this is in lieu of healthcare reform. Emerging research into

neurophysiology and neurobiology of pain clearly shows that movement and bio-psycho-social professions such as physical therapy are ideal to treat these patients. The increase in chronic pain and general dissatisfaction by patients with care provided creates a unique business opportunity for physical therapists. Additionally, advanced therapeutic treatments for pain, such as therapeutic neuroscience education, graded motor imagery, pacing, graded exposure, exercise and more will become increasingly desirable due to its low cost and its empowerment of the patient. This course will focus heavily on the use and clinical implementation of pain sciences in various therapeutic realms such as private practice, outpatient rehabilitation, inpatient acute care, large hospitals, etc. Course work includes marketing chronic pain care to healthcare providers, third-party payers and patients, time-management, compliance, home-exercises, staff development, development of a pain program, billing documentation, outcome measures and more. The evidence for pain science is ever-increasing but must be "taken to the clinic." This course is a must for everyone interested in helping people in pain clinically.

Course Objectives: At the end of the course the student will be able to or will have completed:

1. Understand the epidemiological issues associated with chronic pain, including increased patient dissatisfaction
2. Develop an understanding of how the pain epidemic is impacting clinical practice, including economical issues and burnout
3. Be updated on the latest evidence and understanding of how a movement, bio-psycho-social and neuroscience approach is needed to assist patients with persistent pain
4. Be updated on the contents of a best-evidence pain management program
5. Identify opportunities for the development, implementation and marketing of such a pain program to other healthcare providers and the public
6. Utilize material, strategies and concepts from the pain certification to develop pain programs in a variety of clinical settings and patient populations
7. Apply the information from the educational session into clinical practice

ISPI 7180 TPS Program Capstone Project & Examinations Capstone 1 credit

The capstone course consists of the final project for Therapeutic Pain Specialist Certificate Program students. TPS students have the option to create a presentation or complete a written exam (case study format), both of which demonstrate the ability to synthesize and apply the most important aspects of pain neuroscience education. The capstone projects are created by the Program Director to demonstrate competency in selected pain science applications.

PNEF 6410 Special Topics in Pain Neuroscience Education- online, faculty-led 4 credits

The TPS program focuses heavily on therapeutic neuroscience education, which is now more commonly referred to as pain neuroscience education (PNE). Various randomized clinical trials and recent systematic reviews on PNE conclude that PNE is only one aspect of a potentially effective pain management program. In line with this evidence, ISPI teaches the concept of "PNE Plus," indicating PNE is best utilized clinically by combining it with other proven strategies in treating people with pain versus utilization as a stand-alone treatment. Various additional aspects of pain management are introduced in the TPS program, but in this 12-week, faculty moderated course, students delve into 12 specialized topics to deepen their knowledge related to these treatment options. The PNE Plus topics were selected based on TPS graduate feedback. Each week contains 10-12 required videos, handouts and both required and supplemental articles and videos. This content accounts for approximately 4-6 hours of study per week.

Special topics include:

1. Sleep Hygiene
2. Aerobic exercise
3. Goal setting
4. Nutrition
5. Relaxation, meditation and mindfulness
6. Pharmacology
7. Emotional wellbeing: Coping Skills, Humor and Spirituality
8. Manual therapy
9. Breathing and biofeedback
10. Safe, healing environment and Social Interaction
11. Journaling, Art and Expressive Writing
12. Movement Therapies: Thai Chi™, Yoga, Aquatic Therapy, etc.

The PNE+ course content has been developed by senior ISPI faculty in conjunction with outside specialists contracted for the development of the various topics, i.e., physician for the pharmacology content, dietitian for the nutrition content, etc. Upon completion of each PNE+ module, students complete an online quiz, as well as video recorded reflections and application exercises, requiring a 90% pass rate to move on to the next module.

Upon completing this course, you'll be able to:

1. Describe endogenous mechanisms by which the variety of interventions described in PNEF 6410 improve pain and function in individuals with pain.
2. Describe the role of the immune system and endocrine system and how they can be influenced to promote improvement in pain and function by the interventions described.
3. Cite current trends in each of the treatment interventions described, along with potential future applications of the interventions in patients with complex and/or chronic pain.
4. Develop and apply introductory skills in those "PNE Plus" topic areas of interest which are within the scope of practice for individual fellowship candidates.
5. Provide rationale for the use of interventions beyond the practitioner's current "tool box" and/or scope of practice, and guide patients in their pursuit of individualized strategies to treat pain, including making appropriate referrals as necessary.

PNEF 6410 WI Special Topics in Pain Neuroscience Education—Weekend Intensive 1 credit

This two-day, on-site lab course is designed to enhance the participant's knowledge and skill level in the evidence-based management of individuals with complex and/or chronic pain. Fifty percent of the weekend intensive course builds on the content presented in the online pre-requisite course: PNEF 6410: Special Topics in Pain Neuroscience Education. It includes clinical reasoning and hands-on skill development necessary to effectively integrate a variety of intervention techniques (therapeutic environment, emotional well-being, sleep hygiene, medication, goal setting, creativity, nutrition, mindfulness, breathing, movement therapies, manual therapy, and exercise) into the clinical management of individuals with pain. Twenty-five percent of this course builds off the introductory treatment information outlined in the Fellowship pre-requisites Neurodynamics, and Too Hot to Handle (GMI) and focuses on the advanced application of these techniques in complex clinical situations. Twenty-five percent of this course focuses on personal and professional development, prevention of healthcare provider burnout, and integrating PNE Plus strategies into personal practices for wellness and skill development. Successful completion of this course requires 90% or higher on the post-test, onsite skills assessment and attendance at each onsite day.

Upon completing this course, the student will be able to:

1. Implement clinical decision-making skills to identify appropriate candidates for the various techniques covered in the online pre-requisite PNEF 6410 course.
2. Demonstrate entry-level proficiency administering the variety of interventions described in PNEF 6410 to improve pain and function in individuals with pain.
3. Provide rationale for the use of interventions beyond the practitioner's current "tool box" and/or scope of practice, and guide patients in their pursuit of individualized strategies to treat pain, including making appropriate referrals as necessary.
4. Demonstrate expert-level proficiency in administering neurodynamic tests and interventions to patients demonstrating peripheral neurogenic symptoms.
5. Demonstrate expert-level proficiency in administering GMI testing and interventions to patients demonstrating features of nociplastic pain states.
6. Establish a personal plan for integrating PNE Plus practices into daily routines to foster personal and professional well-being and prevent healthcare provider burnout.

PNEF 7190 Fellowship Mentored Clinical Practice- ongoing throughout program 1 credit

Mentoring is a cornerstone in any fellowship program, with self-reflection, performance evaluation, and feedback from mentors fostering meaningful personal and professional growth. Mentoring will occur throughout the course of the Pain Sciences Fellowship, but it will not look like the traditional mentoring programs one might expect in manual therapy fellowships, medical/surgical fellowships, etc. No formal, on-site, 1:1, intra-disciplinary clinic hours with designated/certified clinical mentors are currently required. Rather, we will use a variety of technology platforms to foster a culture of mentorship and growth, including Zoom meetings, video-based learning and Moodle-based discussions of special topics, challenging cases, and current best-evidence throughout the program. This virtual environment will provide unique advantages in terms of logistics, cost, and high-quality, team-oriented feedback for fellows in training. The formal component of the Fellowship Mentored Practice course (PNEF 7190) will include live, online meetings with guest faculty and content experts, student case presentations, research articles, and student reflection and interaction via discussion boards. The live, "face-to-face" sessions with the Program Director, senior faculty and content experts in the world of pain science will provide opportunities for question/answer, deep discussion, and guidance for clinical scenarios. Further mentorship is integrated in all other courses, and in particular, PSF 7570: Virtual Rounds.

Upon completing this course students will be able to:

- 1) Compare their individual practice patterns for patients with chronic pain to those of faculty, guest lecturers and their peers, identifying areas for professional growth in evidence-based patient care.
- 2) Formulate meaningful questions for guest lecturers and content experts to add value to online, live group discussions (i.e. Zoom meetings).
- 3) Synthesize and apply knowledge from the literature as well as mentors and "experts" in the treatment of challenging patients suffering from pain.
- 4) Evaluate their peers' application of pain science principles, including assessment, diagnostic sub-grouping, and treatment selection and offer constructive feedback.
- 5) Contribute to peer learning through the addition of high value research articles and succinct, relevant commentary on Zoom meeting topics.

RES 6110 Writing Case Reports & Case Series- online, self-directed 1 credit

This four-week self-paced, online course is designed to improve knowledge regarding the importance of case reports/series in the medical literature and provides the foundation of the skill-set needed as Fellows-in-Training (FiT) work towards completing their own original case report or case series. This module is borrowed from the EIM AAOMPT fellowship. This course reviews the steps involved in

completing a case report suitable for publication. This involves examining foundational material and critiquing the initial submission of a published case report. Learning the process of producing a meaningful case report along with the ability to critically appraise other published reports will improve the student's foundational knowledge as an evidence-based clinician.

Upon completing this course students will be able to:

1. Understand the key components of a written case report.
2. Understand when IRB approval is needed for human research and complete "The Good Clinical Practice" course (<https://gcp.nidatraining.org/>).
3. Compare the design of a case report / case series to other forms of clinical research.
4. Be prepared to conduct a prospective clinical case series, including IRB proposal and informed consent document, data collection forms, the data collection process, data analyses, and presentation in written and poster formats.
5. Critically analyze 2 case reports.

PNEF 6410TA Teaching Assistant Role- Therapeutic Neuroscience Education 0 credits

During the one-year fellowship, FiT students are required to serve as a moderator for an online PNE class for TPS/CE students. FiT students will be allocated to one of the four annual cohorts for PNE and will be required to lead a small group of students for six weeks. The FiT will monitor the group discussions regarding the various posted questions, facilitate and answer questions, and provide necessary references/resources as part of their replies. They will also evaluate students' performance by assigning grades each week. Senior ISPI faculty will supervise FiTs throughout this process, offering regular feedback. This course will allow FiT students to not only review the material in PNE as a student, but also to take on the roles of mentor and teacher, thus deepening their own learning experience.

PNEF 6110 Multidisciplinary and Interdisciplinary Approach to PNE- online, faculty-led 1 credit

Chronic pain is larger than one approach and larger than one profession. At ISPI we believe, and current best-evidence supports, that multidisciplinary and interdisciplinary care and building such relationships are the future of truly helping people with persistent pain. Both multi- and interdisciplinary care related to pain management are severely lacking in the US healthcare system. This four-week, faculty-led session will explore the evidence, development and implementation of a multi- and interdisciplinary approach to pain. This session will explore various team members' roles, contributions, strengths and weaknesses associated with multi- and interdisciplinary care. Students will be required to complete clinical observation hours (three full days with professionals from a provided list – i.e., surgeon, pharmacist, massage therapist, chiropractor, psychologist, etc). Upon completion of each observation, students will complete an extensive survey showcasing various aspects of the observed profession as it pertains to chronic pain (i.e., strengths, weaknesses, opportunities for collaboration, etc.). These reports are uploaded to a FiT discussion board for the students, moderated by faculty, allowing for discussion of the various aspects of their multi- and interdisciplinary care experiences.

Upon completion of this course students will be able to:

1. Describe the history and potential future trends for multi- and interdisciplinary pain care in the United States.
2. Cite areas of challenge and opportunity for teams housed under one roof, as well as those scattered throughout the community, to promote cohesive patient care.
3. Appreciate the roles of other disciplines and define their own role in a multi- or interdisciplinary team.

4. Network with individuals in their community to foster stronger relationships to optimize patient care.
5. Articulate the role of PNE to health care providers of different disciplines who are unfamiliar with its use and value for patients suffering with chronic and/or complex pain issues.

PNEF 6420 Advanced Clinical Practice- online, faculty-led

4 credits

The cornerstone of a fellowship is advanced clinical reasoning, advanced clinical practice and mentorship. A significant part of the ISPI-EIM pain fellowship will constitute virtual rounds. The virtual rounds constitute the bulk of clinical mentorship of the program. For students to be able to present, defend and discuss their cases for the virtual rounds, students in the advanced clinical practice module are first exposed to a comprehensive case-based learning experience led by senior ISPI faculty, as well as invited faculty for specific cases. Senior faculty present a variety of cases and systematically describe, discuss and demonstrate their reasoning process, tests, treatments and progression in these cases. During the eight-week advanced clinical practice, eight different cases will be showcased via online videos, written content and supportive literature for the case. During the eight-week class, students will be involved in comprehensive online discussions regarding the various cases and moderated by faculty.

PNEF 7570 PSF Virtual Rounds- online, faculty-led

6 credits

PNEF 7570 provides most of the clinical mentorship for the Pain Sciences Fellowship program. Not only do students perform self-assessment as they reflect on their cases, but they receive feedback from faculty and peers. In this 16-week, online, faculty-led module, students record and present four cases, including:

- Subjective examination of a patient (video upload and share).
- Physical examination of a patient (video upload and share).
- Treatment of a patient (video upload and share).
- Treatment progression (video upload and share).

During the 16-week program, students will each present four cases for peer review and feedback. Each upload and presentation will be graded and students will need a minimum score of 80% to pass the virtual rounds module.

RES 7280 PSF Scholarly Project- ongoing

1 credit

The ISPI Pain Fellowship requires fellows in training (FIT) to complete a scholarly project. Given the wide diversity of each FIT's experience, work environment, specialty, profession, resources available, etc. the scholarly project offers 4 options, of which students select one: a case study pertaining to pain science; a case series pertaining to pain science; data collection/research collaboration with ISPI; or a service project. Case studies and case series are chosen due to their relative ease of completion versus more comprehensive research and to facilitate clinical discussion and application of pain sciences. The exact topic for the project will be chosen by the student based on their current clinical practice, with guidance from their advisor. Even though publication of the case study or case series is not needed to fulfill fellowship requirements, ISPI aims to have students aggressively pursue publication of their work.

PNEF 7210WI Capstone Exam and Weekend Intensive**1 credit**

The final weekend intensive will serve as means for students to review, question and/or discuss any content covered in the pain fellowship. Students will also be required to:

- Present their PNE Capstone PowerPoint.
- Present their scholarly project to their peers and faculty.

On day two of the final weekend intensive, students will also undergo the official ceremony of graduating and being presented with their fellowship certificate.