APTA Innovation Practice Award Application

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Practice Setting: Outpatient Orthopedics
Innovation Name: Ischemic Conditioning Techniques™ (ICT)
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1. Description of Practice Innovation

Ischemic Conditioning Techniques™ (ICT) is a patented, hands-on blood flow modulation method designed to stimulate tissue healing and accelerate recovery across a wide range of musculoskeletal and sports-related injuries. Unlike mechanical tourniquet–based Blood Flow Restriction (BFR), ICT is a precision-applied manual technique that utilizes targeted compression over specific arterial landmarks to induce brief, controlled periods of partial vascular occlusion followed by reactive hyperemia.

ICT is grounded in the physiological principles of ischemic conditioning and mechano-transduction. Short, controlled and partial reductions in blood flow stimulate the arterial bed to release endogenous anti-inflammatory and vasoactive mediators (including endocannabinoids, adenosine, and bradykinin etc.) which enhance perfusion, modulate pain, and improve the health and resilience of tissues distal to the occlusion site.

Please see the TEDx Talk given by the founder Vinita Chandra Mody called A Physical Therapist's Chokehold.

Vinita Chandra Mody: A physical therapist's chokehold | TED Talk

2. Application of Practice Innovation

Ischemic Conditioning Techniques™ (ICT) is applied clinically through a standardized protocol that can be applied to the full body. Five progressive courses or systems have been developed to train practitioners in this technique:

- **System I: Lower Extremity**
- **System II: Upper Extremity**
- **System III: Spine and Thorax**
- **System IV: Head and Face**
- **System V: Pelvic and Visceral**

ICT is delivered entirely through skilled manual applications. Therapists use precise hand placement to selectively modulate arterial flow by placing gentle pressure *near* upstream vascular sites that supply distal tissues. The effect is amplified by targeting the vascular supply to

neural structures through integrated neural tension techniques. To learn more about the method click the link for sample curriculum for System 1 Ischemic Conditioning Techniques - Teachable and preview all the videos available.

The technique can be seamlessly integrated into a wide range of clinical settings, including:

- Sports injury recovery
- Orthopedic rehabilitation
- Post-operative rehabilitation
- Chronic pain management
- Neuromuscular re-education
- Pelvic floor therapy

Ischemic Conditioning Techniques™ (ICT) is currently disseminated through Stroma Physical Therapy's online and live training programs, supporting scalable adoption while maintaining consistency, competency, and safety in clinical application. As we plan for expansion in 2026, ICT will broaden into sports and orthopedic rehabilitation settings, and additional information regarding this growth can be found on our homepage.

Homepage | ICTbyStroma

3. What Makes It Innovative?

ICT is the first patented manual technique that replicates the physiological benefits of ischemic conditioning without external devices. Its innovation rests in:

- **Full manual delivery** with no cuffs, pumps, or machinery
- **Precision anatomical targeting** based on arterial palpation taught through the 5 Systems Courses
- **Integration of vascular, neural, and myofascial systems** into a single, standardized technique
- **Repeatable, measurable physiological response** with improved perfusion, reduced pain, increased ROM, enhanced neuromuscular recruitment and improved functional performance
- **Applicability across specialties** from orthopedic to pelvic health

ICT bridges the gap between manual therapy and vascular-based training methods, creating a new category of intervention.

4. Unique Attributes of Innovation

Ischemic Conditioning Techniques™ (ICT) is a patent-protected intervention (U.S. Patent No. 10,786,424, issued in 2020) that introduces a novel and proprietary clinical method within physical therapy practice. Delivered entirely through hands-only application, ICT requires no external equipment, making it highly accessible and easily integrated across diverse clinical settings. ICT serves as a safe, non-mechanical alternative to traditional tourniquet-based Blood

Flow Restriction (BFR). Whereas conventional BFR is primarily designed to promote muscle hypertrophy through external devices such as tourniquets or blood pressure cuffs, ICT is designed to leverage physiological changes through manual mechano-transduction to support tissue repair and recovery through the mechanisms highlighted above. Unlike traditional BFR, which often requires arterial occlusion levels of 50% or greater, ICT achieves meaningful therapeutic benefit with less than 20% occlusion and without directly compressing the artery, thereby reducing risk while preserving clinical effectiveness. Clinically, ICT produces immediate and observable responses, with improvements in range of motion, pain modulation, and muscle activation frequently noted within minutes and translating to enhanced functional performance. The technique follows a standardized full-body framework, applying a consistent method across multiple anatomically palpable upstream vascular sites. ICT is highly adaptable for both acute injuries and complex, sensitized pain presentations, particularly when conventional strengthening approaches are limited or poorly tolerated. By promoting tissue recovery through activation of endogenous adaptive physiological responses, ICT enhances tissue perfusion, supports neuromodulation, and contributes to measurable functional outcomes.

5. Impact on the Profession

Ischemic Conditioning Techniques™ (ICT) offers physical therapists a novel, evidence-informed intervention that advances clinical practice by integrating skilled manual therapy with contemporary physiological research in ischemic conditioning. By adding targeted vascular modulation to the traditional manual therapy skill set, ICT expands the profession's ability to treat both acute and chronic conditions through a unified protocol applied throughout the body via our systems-based courses. The technique provides a standardized and repeatable method for tissue conditioning, allowing clinicians to deliver consistent, effective care across diverse patient populations while improving efficiency and clinical outcomes. At Stroma PT, trained practitioners apply ICT daily, treating musculoskeletal injuries ranging from acute post-operative cases to chronic pain, with measurable improvements in patient function and recovery. ICT also aligns with a growing body of research on ischemic preconditioning and postconditioning, particularly in sports medicine. With demonstrated benefits in reducing tissue injury and supporting rapid recovery, ICT is being introduced into sports rehabilitation and recovery at the youth, college and professional levels to help prevent injuries (pre-conditioning) and optimize return-to-play outcomes (post-conditioning). Through these applications, ICT reinforces physical therapy's leadership in translating emerging physiological evidence into practical, patient-centered care across outpatient orthopedics, sports injury, and rehabilitation settings.

6. Impact/Relevance of Practice Innovation to Patient Care

Patients treated with ICT by trained practitioners will experience:

- **Reduced pain** through improved microcirculation and desensitization
- **Enhanced muscle activation** especially in inhibited or post-surgical tissues
- **Faster return to function** due to accelerated healing process
- **Better exercise tolerance** for acute, deconditioned or chronic pain populations

ICT offers a highly accessible, low-risk, high-impact treatment option for diverse patient needs.

7. Outcomes of the Practice Innovation

Across more than a decade of use at Stroma Physical Therapy and other local clinics, ICT has demonstrated:

- Noticeable improvements in ROM immediately after application
- Reduction in pain scores by 20–60% within a single session
- Improvements in local muscle recruitment (e.g., VMO activation for post-surgical ACL patients)
- Faster progression to functional loading and strengthening
- Reduced patient visits for conditions such as Achilles tendinitis, lateral epicondylitis, rotator cuff syndrome, gluteal and proximal hamstring strains
- High patient satisfaction and increased adherence

Anecdotal and preliminary clinical data from thousands of treatments support its value, with ongoing plans for formal research publication and expansion of online and lab curriculum nationally.

8. Current Stage of Innovation and Development Timeline

Ischemic Conditioning Techniques™ (ICT) was developed and refined between 2013 and 2020, during which time the full-body clinical protocol was established and optimized through sustained clinical application. Early dissemination of the concept occurred through two poster presentations at the 17th and 18th Annual Meetings of the International Dose Response Society, held at the University of Massachusetts in Amherst in 2017 and 2018, where ICT was presented within the broader scientific context of preconditioning in medicine and biology. In 2020, the innovation reached a significant milestone with the awarding of a U.S. patent, formally recognizing ICT as a novel and proprietary clinical method. Following patent approval, ICT was formalized into structured online and live training programs through Stroma Physical Therapy and implemented for employed Stroma physical therapists beginning in 2020. Between 2022 and 2024, ICT entered a preliminary academic research phase through a collaborative systematic review with the New York University (NYU) Department of Physical Therapy (DPT) program, culminating in the presentation Effects of Manual Therapy in Individuals with Achilles Tendinopathy at the Combined Sections Meeting by Vaibhavi Rathod (CSM). Looking ahead, the 2026 goal is to expand ICT into multicenter research initiatives and establish advanced certification pathways for physical therapists nationwide. ICT is currently in the scaling and research expansion phase, positioned for broader national adoption across diverse clinical and sports medicine settings.

Timeline

- **2013 - 2020 -** Technique development, refinement of full-body protocol
- **2017 & 2018 -** Poster presentations at International Dose Response Society Annual Meetings on Preconditioning in Biology and Medicine, UMass, Amherst, MA
- **2020 -** Patent awarded
- **2020 - present:** Formalization into Stroma Physical Therapy's online and live training programs for employed Stroma Physical Therapists

- **2022-2024 -** Systematic Review with NYU DPT program and CSM presentation Effects of Manual Therapy in Individuals with Achilles Tendinopathy - Systematic Review." by Vaibhavi Rathod, PT, PhD
- **GOAL 2026 -** Expansion into multicenter research and advanced certification for PT's across the USA

9. Cost of Innovation

Ischemic Conditioning Techniques™ (ICT) was intentionally designed as a low-cost innovation to maximize accessibility across a wide range of clinical settings. The technique requires no machinery, equipment, or consumable supplies, reducing barriers to implementation and ongoing use. To date, all development, research, and dissemination efforts have been self-funded, and while clinician training fees are intended to support curriculum development, pricing has not yet been established, as enrollment has not been opened to therapists outside of Stroma. Support from APTA Orthopedics would enable further research validation, enhancement of educational materials, and broader access to training, facilitating wider adoption of ICT by physical therapists nationwide.

Award funds will be allocated to the following initiatives:

1. **Clinical Research Support**
   To advance clinical research validating Ischemic Conditioning Techniques™ (ICT) outcomes—including range of motion (ROM) metrics, EMG activation, and perfusion studies—**$500** will be allocated toward time spent engaging local universities to explore research partnerships and collaborative opportunities.
2. **Enhanced Anatomical and Vascular Imaging Resources**
   To strengthen educational materials, **$350** will support the development of advanced anatomical and vascular imaging resources in collaboration with a student from the School of Visual Arts (SVA) in New York City.
3. **Digital Learning Platform Development**
   To build a more robust digital learning platform, including expanded case libraries and high-quality technique videos, **$350** will be allocated to work with a student from the School of Visual Arts (SVA) in New York City.
4. **Quality Assurance and Certification Expansion**
   To ensure safe, consistent, and standardized implementation of ICT, **$300** will be dedicated to research and evaluation of national accreditation and certification frameworks.
5. **Equitable Access and Community Impact**
   A long-term goal of this funding strategy is to subsidize ICT training for clinicians serving underserved communities, expanding access to effective, low-cost therapeutic interventions.

11. Training Required for Utilizing the Innovation

Clinicians complete the following requirements:

- **Online and Live Instruction:**
  Participation in Stroma Physical Therapy's online system-based modules (see *System 1: Ischemic Conditioning Techniques – Teachable* for a representative sample of the curriculum). Each system course provides **1.0 CEU credit** and includes **5 hours of online instruction** and **5 hours of live, hands-on laboratory training**. Live labs emphasize arterial palpation by body segment, safety parameters, and full-body sequencing.

- **Competency Assessment and Certification:**
  Successful completion of competency assessments in both the online and in-person lab components, qualifying clinicians for **New York State–accredited Continuing Education Units (CEUs)**.

Training emphasizes safety, contraindication screening, and measurable outcomes.

12. Justification for APTA Orthopedics Funding This Innovation

Ischemic Conditioning Techniques™ (ICT) aligns directly with APTA Orthopedics' mission to advance evidence-based, accessible, and high-impact interventions within orthopedic physical therapy. Funding ICT would support a novel, patent-protected innovation that was created and is led by a physical therapist, reinforcing the profession's role as a driver of clinical innovation. ICT enhances orthopedic care without increasing healthcare costs and broadens the scope of physical therapy through an equipment-free approach, making it equitable and feasible across a wide range of practice settings. Support for this innovation would also facilitate the generation of research that advances the orthopedic physical therapy evidence base, particularly within the evolving Blood Flow Restriction and vascular modulation space. Ultimately, ICT strengthens the profession's leadership in delivering innovative, non-invasive solutions and offers a safe, scalable, and physiologically impactful intervention capable of meaningfully improving patient outcomes and advancing the profession as a whole.