

# Newer Technologies for Pain Care

A stethoscope with a black tube and silver chest piece is resting on a clipboard. The clipboard has a white sheet of paper with medical forms, including fields for 'NEW PATIENT REGISTRATION', 'PLEASE PRINT', 'Work Phone', 'Home Phone & Address', and 'INSURANCE'. A black pen is also on the clipboard. The background is a light blue surface.

- *Albert Ray, MD*
- *The LITE Center*
- *Miami, FL*

# Newer Technologies for Pain Care

A photograph of a medical setting. In the foreground, a silver stethoscope with a black tube is prominently displayed. Behind it, a teal clipboard holds a white form with various fields and text, including 'NEW PATIENT REGISTRATION', 'PLEASE PRINT', 'Work Phone', 'Home & Address', and 'INSURANCE'. A black pen lies on the form. The background is a light blue surface, possibly a desk or table.

*No conflict of interest or disclosures for this presentation*



The Power of Energy Medicine



“*Chronic Stress* is not just a feeling---- it is a biological force that accelerates aging, fuels inflammation, worsens pain, and increases the risk of cardiovascular disease, depression, and early mortality. At the cellular level, stress shortens telomeres, the protective caps on our DNA that serve as a biological marker of aging.” *Peter Staats, MD*

# Newer Technologies for Pain Care

A stethoscope with a black tube and silver chest piece is positioned diagonally across the frame. It rests on a light blue clipboard that holds several white medical forms. A black pen is also on the clipboard. The background is a soft-focus clinical setting with a white wall and a blue object hanging on the wall.

- Lasers
- Vagus nerve stimulation
- Virtual Reality
- Mind-Body connections
- Manual Therapies
- Nutrition and Supplements
- EMDR
- Compounded substances

# Newer Technologies for Pain Care

A photograph of a medical setting. In the foreground, a silver stethoscope is prominently displayed, resting on a light blue surface. Behind it, a teal clipboard holds several white medical forms. A black pen lies on top of the forms. The background is slightly blurred, showing more of the same forms and a hint of a blue container. The overall lighting is soft and clinical.

- Lasers



# . LASERS

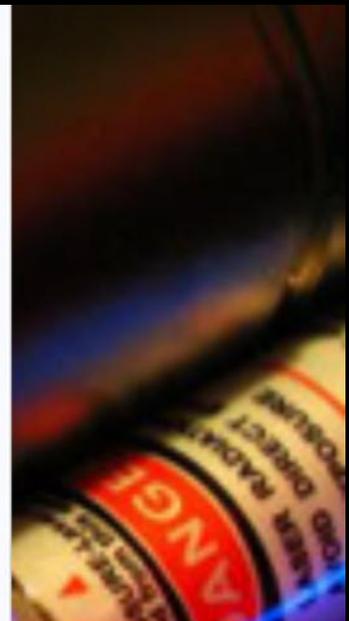
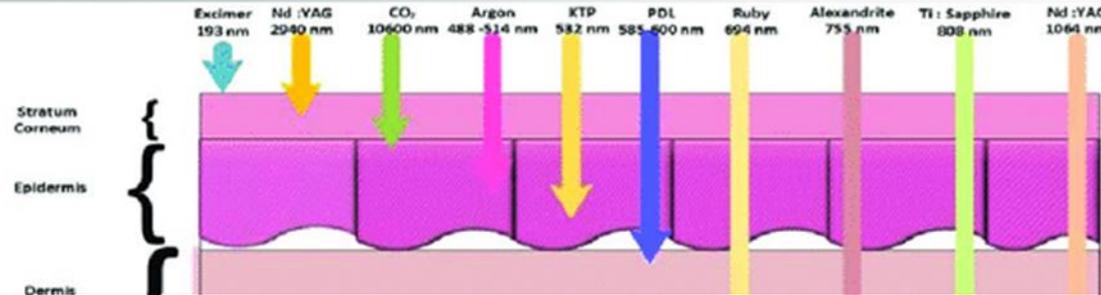
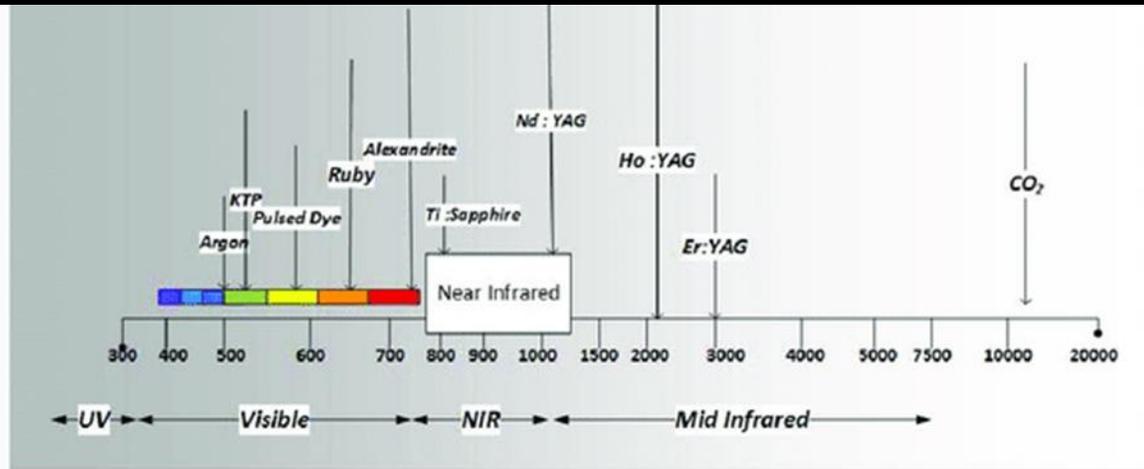
DIFFERENT WAVELENGTHS

VISIBLE 400-950 nm;  
Invisible UV and  
far Infrared

*What's available  
hand held  
preprogrammed  
transdermal  
Interstitial  
IV*

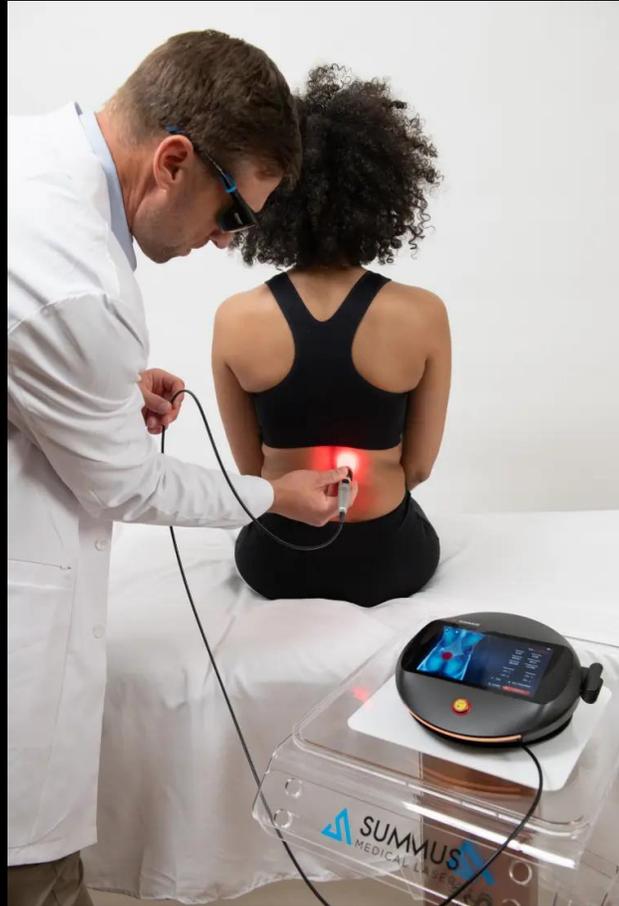


This Photo by Unknown Author



# . LASERS

*preprogrammed transdermal*



# . LASERS

*Interstitial and Intravenous*



# . LASERS

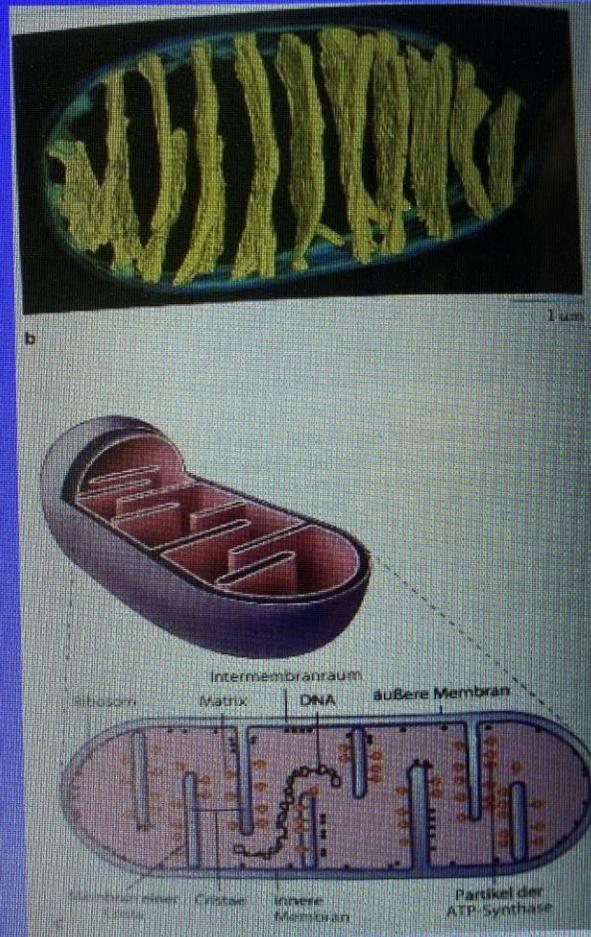
*Unique applications*



# What do Lasers Do?

- Improves oxygenation,
- reduces inflammation,
- supports cellular repair
- Enhances microcirculation and nutrient delivery
- Stimulates mitochondrial ATP production
- Supports mitochondria

## The structure of the mitochondria



The structure of the mitochondria can be different in the special types of tissue cells.

In living cells mitochondria have a dynamic structure; this means that they can vary in their structure and size. They are able to merge or to divide themselves.

The mitochondria are making out about 10 – 15 % of the volume of a living cell.

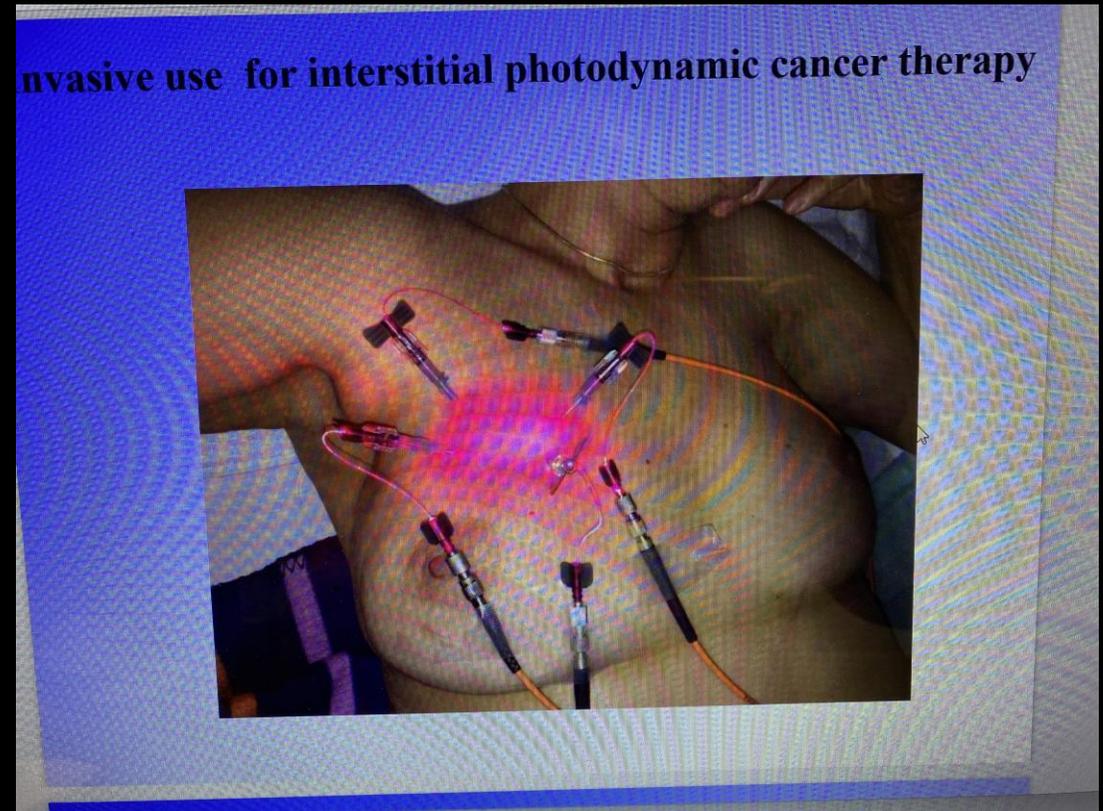
Their main task is the production of ATP.

The mitochondria have an inner and outer membrane.

In the inner room of the mitochondria we can find the cristae, formed by double layer membranes, where the respiratory chain is located and the production of ATP takes place.

# Photobiomodulation vs Photodynamic therapies

- Photodynamic Therapy
- Cancer treatment
- Destructive
- Uses photosensitizers
- Promotes apoptosis
- Reduces blood supply to cells
- Reduces nutrients to cancer cells



# Photobiomodulation vs Photodynamic therapies



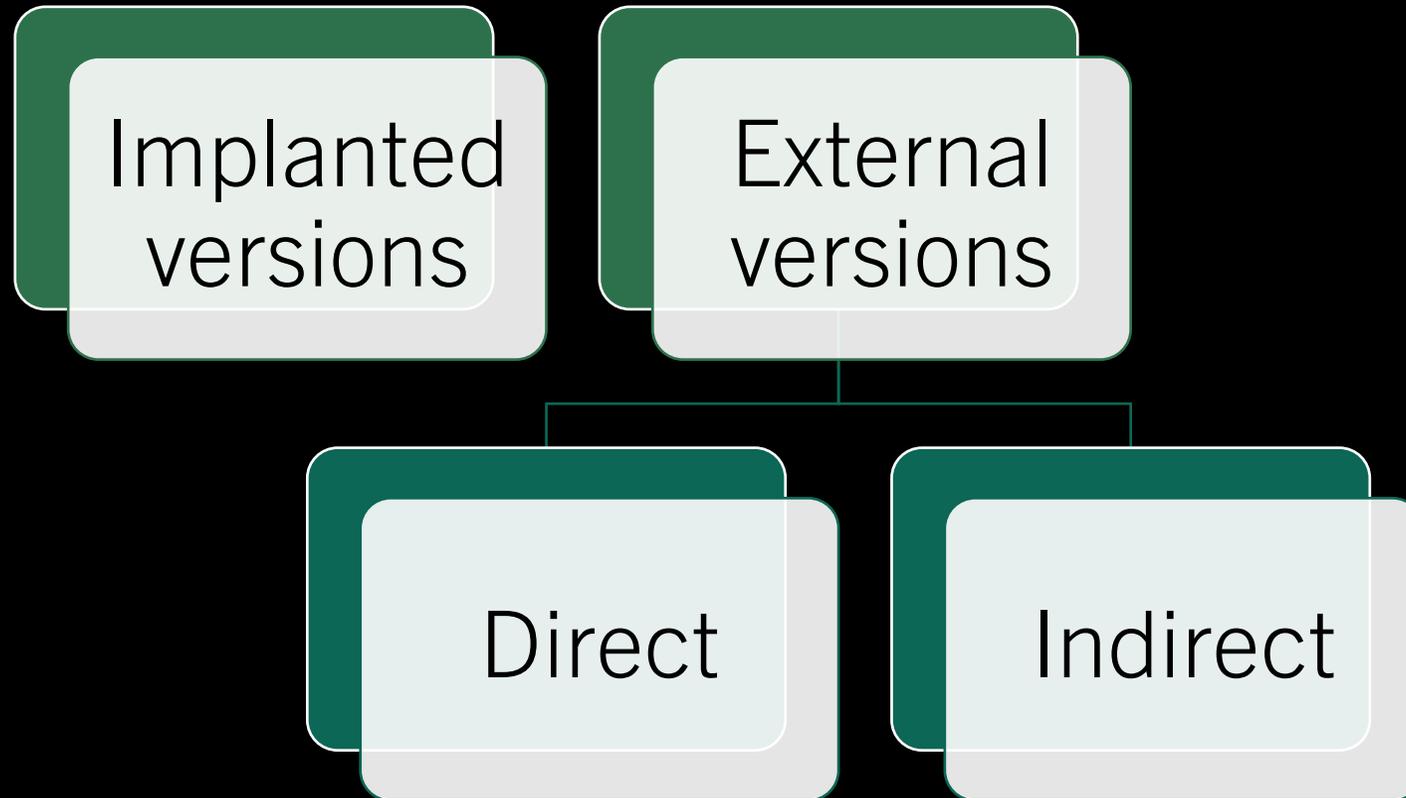
- PBM can improve
  - the metabolic capacity of neurons,
  - stimulate anti-inflammatory, anti-apoptotic, and antioxidant responses,
  - promote neurogenesis and synaptogenesis.
  - enhance mental clarity and reduce episodes of brain fog, helping users feel sharper and more focused.

# Vagus Nerve Stimulation

# Vagus Nerve Stimulation

- The Vagus Nerve Society... Peter Staats, MD
- *At the Vagus Nerve Society, we are united by a simple but profound belief: **the future of health care lies not only in treating disease, but in restoring balance, resilience, and biological well-being.***
- **“Chronic Stress is not just a feeling---- it is a biological force that accelerates aging, fuels inflammation, worsens pain, and increases the risk of cardiovascular disease, depression, and early mortality. At the cellular level, stress shortens telomeres, the protective caps on our DNA that serve as a biological marker of aging.”** P. Staats, MD

# Vagus Nerve Stimulation



# Vagus Nerve Stimulation

vagus nerve travels more than a foot and a half from the stem of the brain to the heart, lungs, stomach, pancreas, digestive tract, kidneys, spleen and liver, among other places.

# Vagus Nerve Stimulation

- vagus nerve *regulates cytokines in the inflammatory response*
- Vagus nerve *regulates internal organ function*
- *Only bidirectional nerve*
  - 80% ascending; 20% descending fibers
- 100 more fibers on R side compared to L side

# Vagus Nerve Stimulation

- *Rebalances autonomic system*
  - Chronic illnesses and inflammatory responses  
sympathetic overdrive
  - Vagus nerve stimulation increases parasympathetic

# Vagus Nerve Stimulation

- Implanted for resistant depression
- External current approval for
  - Multiple headache types
  - Relaxation
  - Sensitization issues
  - Emerg Use for Long COVID
  - Seizures

# Newer Technologies for Pain Care

- EMDR (eye movement desensitization and reprocessing)

- Francine Shapiro, PhD founder

# Newer Technologies for Pain Care

- EMDR (eye movement desensitization and reprocessing)
  - Detaches emotional reaction from the issue
  - Resets emotional circuit breakers????
  - Alternating sensory stimulation while processing an issue
  - Units of Distress
- Francine Shapiro, PhD founder

# Newer Technologies for Pain Care

- **EMDR** (eye movement desensitization and reprocessing)
  - Brain stores memory in pneumonics, not pictures
    - Like issues filed together, saves space
  - Useful for painful conditions
  - Useful for PTSD and other sensitization issues
    - Depression
    - Anxiety
    - Relaxation
    - Addiction

# Newer Technologies for Pain Care

A medical-themed background featuring a teal clipboard with a white sheet of paper, a black stethoscope, and a silver reflex hammer. The scene is dimly lit with a blue tint.

- Regenerative Injection Therapies

# Newer Technologies for Pain Care

A stethoscope with a silver chest piece and black tubing is positioned diagonally across the frame. It rests on a clipboard that holds several medical forms. A black pen is also visible on the clipboard. The background is a soft-focus clinical setting with light blue and white tones.

- Regenerative Injection Therapies
- Prolotherapy
  - Most conservative
- PRP (platelet rich plasma)
- Stem cells and derivatives
- Laser assistance

# Newer Technologies for Pain Care

- Regenerative Injection Therapies
  - Prolotherapy
    - *Any irritating stimulus*
    - *Dextrose most common*
    - *Enhances blood flow*
    - *Strengthens normal tissue*
    - *Useful for ligaments, tendons, joints*
    - *Not muscle body*

# Newer Technologies for Pain Care

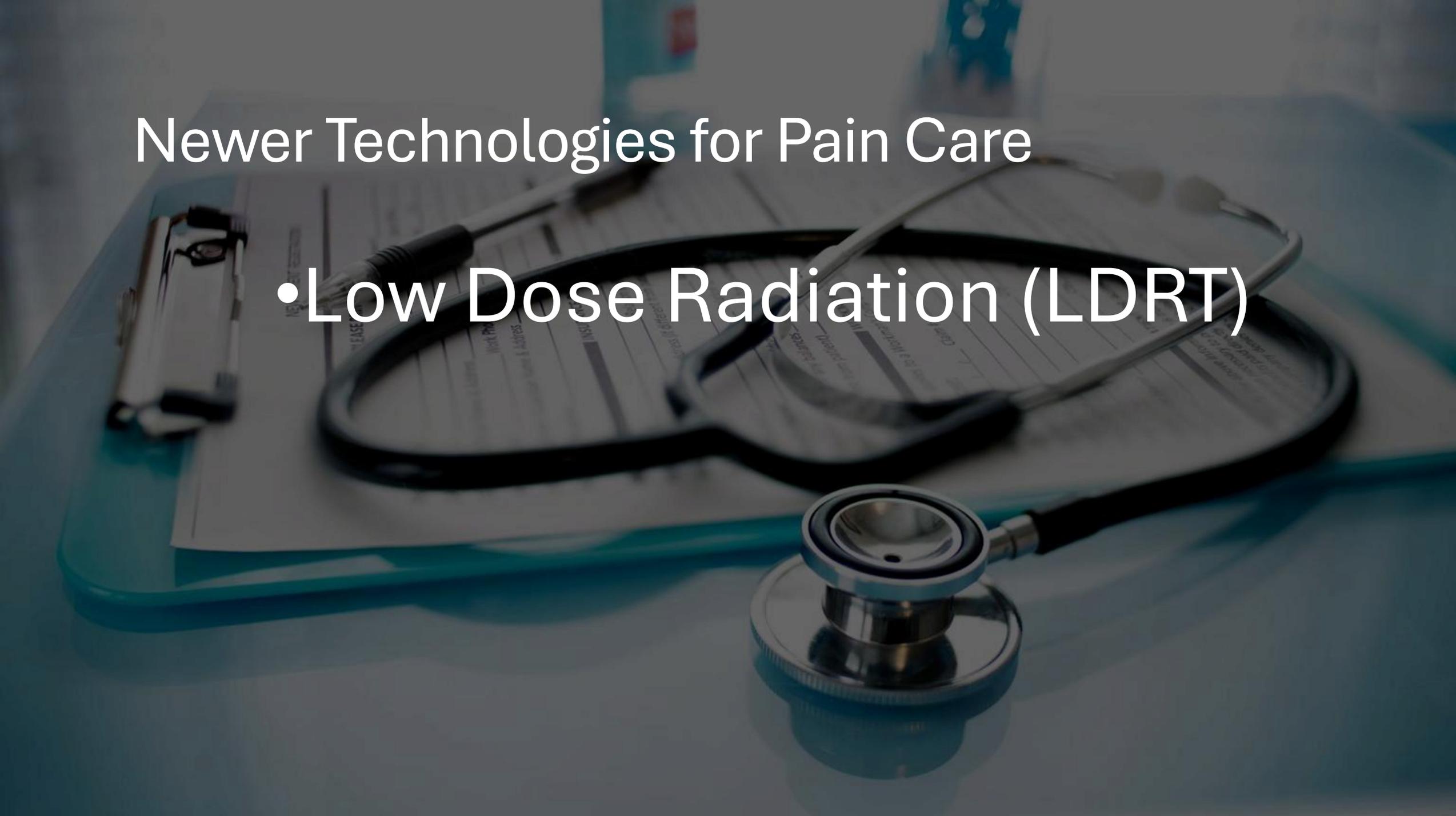
- Regenerative Injection Therapies
  - Platelet Rich Plasma
    - *Autologous blood best*
    - *Count the platelets!!!!!!!!!!!!*

# Newer Technologies for Pain Care

- Regenerative Injection Therapies
  - Stem Cells and Derivatives
    - *Illegal vs legal*
    - *Commercial products*
    - *Bone marrow*
    - *Fat*
    - *Laser assisted bone marrow*

# Newer Technologies for Pain Care

- Low Dose Radiation (LDRT)



# Newer Technologies for Pain Care

- Low Dose Radiation (LDRT)
- For chronic inflammatory painful conditions
  - LDRT is growing in use for osteoarthritis and inflammatory joint disorders.
  - Targets inflamed cells
  - Does not destroy cells
- Low doses of radiation work by decreasing the activity of inflammatory cells and reducing the production of inflammatory cytokines.
- LDRT has effectively treated non-cancer conditions for over 100 years.

# Newer Technologies for Pain Care

- Stellate Ganglion blocks

# Newer Technologies for Pain Care

- **Stellate Ganglion blocks**

- *Not new, but underused for pain*
- *Reduces sympathetic overdrive*
- *Helps rebalance autonomic system*
- *Relief is usually temporary, but may last long time*
- *Repetition can be helpful*
- *Ultrasound vs Fluoroscopically Guided Procedures*
- *“Best” recommendation is C5-C6 bilateral injections, via U/S, per Dr Mulvaney.*

# Newer Technologies for Pain Care

- Compounded pharmaceuticals



# Newer Technologies for Pain Care

- **Compounded pharmaceuticals**

- *Can be tailored for each patient's needs*
- *Can be delivered in oral, transdermal, or injectable forms*
- *Can mix different classes of meds together*
- *Can become cost effective*
- *Good source of photosensitizers for photobiomodulation or photodynamic therapies*
- *Must find reliable compounding pharmacy*
- *Quality control important issue*

# Newer Technologies for Pain Care

A photograph of a medical setting. In the foreground, a silver stethoscope with a black tube is resting on a light blue surface. Behind it, a teal clipboard holds several white medical forms. The forms contain various fields and text, including 'PAIN MANAGEMENT', 'INSURANCE', and 'PHYSICIAN'. The background is slightly blurred, showing more of the light blue surface and some indistinct shapes.

- **Nutrition and Supplements**

# Newer Technologies for Pain Care

- **Nutrition and Supplements**
  - *Eat the rainbow*
  - *Anti-inflammatory nutritional programs*
  - *Keto-diet*
  - *South Beach diet*
  - *Intermittent fasting*
  - *Example: Cook's Anti-inflammatory Recipe Book*

# Newer Technologies for Pain Care

- **Nutrition and Supplements**
  - *Genetically based supplements*
  - *Quality testing, reliable brands important*
  - *Vital antipain and health oriented supplements*
    - *Vit D*
    - *Magnesium*
    - *Fish oil*
    - *B vitamins*
    - *Vit C*
    - *Elemental Metals*

# Newer Technologies for Pain Care

- Manual Therapies



## Newer Technologies for Pain Care

- Manual Therapies
  - Massage
  - Craniosacral
  - Chiropractic
  - John Barnes Myofascial Release

# Newer Technologies for Pain Care

- Mind-Body Therapies



# Newer Technologies for Pain Care

A stethoscope with a black chest piece and silver tubing is positioned over a clipboard. The clipboard has several white medical forms with text like 'NEW PATIENT REGISTRATION' and 'PLEASE PRINT'. A black pen lies on the forms. The background is a light blue surface, possibly a desk or table.

## • Mind-Body Therapies

- Hypnosis
- Deep breathing
- Cognitive-behavioral
- Spiritual
- Computer apps
- Music

• Meditation



## Newer Technologies for Pain Care

- **Virtual Reality**

- Pain Medicine News Oct 25(23):5

# Newer Technologies for Pain Care References

## *Laser*

1.

[Redacted]

[Redacted]

[Redacted]

## Newer Technologies for Pain Care References

### *Vagus Nerve Stimulation*

*1. Peiqi Shao, Huili Li, et al: Role of Vagus Nerve Stimulation in the treatment of Chronic Pain, Neuroimmunomodulation. 2023;30(1):167-183. doi: 10.1159/000531626. Epub 2023 Jun 27.*

*2. Alice Courties 1, Francis Berenbaum 1, Jérémie Sellam: Vagus nerve stimulation in musculoskeletal diseases, Joint Bone Spine. 2021 May;88(3):105149. doi: 10.1016/j.jbspin.2021.105149. Epub 2021 Feb 3.*

*EMDR*

*Regenerative Injection Therapies*

## Newer Technologies for Pain Care References

### *EMDR*

- 1. Ad de Jongh 1 2, Carlijn de Roos 3 4, Sharif El-Leithy: State of the science: Eye movement desensitization and reprocessing (EMDR) therapy, J Trauma Stress. 2024 Apr;37(2):205-216. doi: 10.1002/jts.23012. Epub 2024 Jan 28*
- 2. Jens Schneider 1, Arne Hofmann, Christine Rost, Francine Shapiro: EMDR in the treatment of chronic phantom limb pain, Pain Med . 2008 Jan-Feb;9(1):76-82. doi: 10.1111/j.1526-4637.2007.00299.x.*

## Newer Technologies for Pain Care References

### *Regenerative Injection Therapies*

1. *Felix S Linetsky 1, Rafael Miguel, Francisco Torres: Treatment of cervicothoracic pain and cervicogenic headaches with regenerative injection therapy,*

*Curr Pain Headache Rep . 2004 Feb;8(1):41-8. doi: 10.1007/s11916-004-0039-3*

2. *Bradley D Fullerton : Prolotherapy for the Thoracolumbar Myofascial System, Phys Med Rehabil Clin N Am . 2018 Feb;29(1):125-138. doi: 10.1016/j.pmr.2017.08.010*

3. *Francesca Masiello 1, Ilaria Pati et al: Ultrasound-guided injection of platelet-rich plasma for tendinopathies: a systematic review and meta-analysis, Blood Transfus 2023 Mar;21(2):119-136.*

*doi: 10.1016/j.bct.2023.03.003*

## Newer Technologies for Pain Care References

### *Low Dose Radiation*

1. *Beatriz Álvarez , Angel Montero, et al: Implementing a low-dose radiation therapy program for musculoskeletal pain disorders: tips, tricks, and essentials for clinical researchers, Clin Transl Oncol . 2025 Oct;27(10):4020-4030. doi: 10.1007/s12094-025-03936-8. Epub 2025 Apr 27.*
2. *Oliver J Ott 1, Marcus Niewald, et al: DEGRO guidelines for the radiotherapy of non-malignant disorders. Part II: Painful degenerative skeletal disorders, Strahlenther Onkol . 2015 Jan;191(1):1-6. doi: 10.1007/s00066-014-0757-3. Epub 2014 Sep 20.*

## Newer Technologies for Pain Care References

### *Stellate Ganglion Blocks*

1. *Rashmi Datta 1, Jyotsna Agrawal, et al: A study of the efficacy of stellate ganglion blocks in complex regional pain syndromes of the upper body, J Anaesthesiol Clin Pharmacol. 2017 Oct-Dec;33(4):534-540. doi: 10.4103/joacp.JOACP\_326\_16.*
2. *James H Lynch 1, Sean W Mulvaney, et al: Effect of Stellate Ganglion Block on Specific Symptom Clusters for Treatment of Post-Traumatic Stress Disorder, Mil Med . 2016 Sep;181(9):1135-41. doi: 10.7205/MILMED-D-15-00518.*

### *Compounded Pharmaceuticals*

1. *Abigail E Cline 1, Jake E Turrentine: Compounded Topical Analgesics for Chronic Pain, Dermatitis 2016 Sep-Oct;27(5):263-71. doi: 10.1097/DER.0000000000000216.*

. 2016 Sep-Oct;27(5):263-71.

## Newer Technologies for Pain Care References

### *Nutrition and Supplements*

1. *Osvaldo Daniel Messina 1, Maritza Vidal Wilman 2, Luis F Vidal Neira: Nutrition, osteoarthritis and cartilage metabolism, Aging Clin Exp Res . 2019 Jun;31(6):807-813. doi: 10.1007/s40520-019-01191-w. Epub 2019 Apr 13.*

### *Manual Therapies*

1. *Fabio Zaina 1, Pierre Côté, et al: A Systematic Review of Clinical Practice Guidelines for Persons With Non-specific Low Back Pain With and Without Radiculopathy: Identification of Best Evidence for Rehabilitation to Develop the WHO's Package of Interventions for Rehabilitation, Arch Phys Med Rehabil . 2023 Nov;104(11):1913-1927. doi: 10.1016/j.apmr.2023.02.022. Epub 2023 Mar 23.*
2. *Karen Burg, MT, PTA: Unwinding the Body: Exploring the John Barnes Myofascial Release Approach, dynamicbodyworkmfr; May 4,*

## Newer Technologies for Pain Care References

### *Mind Body Therapies: Hypnosis*

1. Speigel H and Speigel D: *Trance and Treatment 2nd Ed*, American Psychiatric Publishing, Arlington, VA; 2004.

2. Anna Dominika Kaczmarek<sup>1</sup>, Krzysztof Rutkowski<sup>1</sup>, Michał Mielimaka: *Immediate hypnosis effects and outcome predictors in chronic nociceptive pain*, *Am J Clin Hypn* 2024 Sep;66(3):231-242.

doi: 10.1080/00029157.2023.2243618. Epub 2023 Sep 14.

3. P Rosatti: *[Pain and hypnosis]*, *Ther Umsch* 1989 Aug;46(8):561-6.

. 1989 Aug;46(8):561-6

## Newer Technologies for Pain Care References

### *Mind Body Therapies: Cognitive-Behavioral Therapies*

1. S Y Tan 1, C A Leucht: *Cognitive-behavioral therapy for clinical pain control: a 15-year update and its relationship to hypnosis*, *Int J Clin Exp Hypn* 1997 Oct;45(4):396-416. doi: 10.1080/00207149708416140
2. M Catherine Bushnell 1, Marta Ceko, Lucie A Low: *Cognitive and emotional control of pain and its disruption in chronic pain*, *Nat Rev Neurosci* 2013 Jul;14(7):502-11. doi: 10.1038/nrn3516. Epub 2013 May 30.
3. Shangyi Bao 1, Mengyuan Qiao et al: *Neuroimaging Mechanism of Cognitive Behavioral Therapy in Pain Management*, *Pain Res Manag* 2022 Feb 2:2022:6266619.  
doi: 10.1155/2022/6266619. eCollection 2022.

## Newer Technologies for Pain Care References

### *Virtual Reality*

- 1. Qiangru Huang 1, Junqing Lin, et al: Using Virtual Reality Exposure Therapy in Pain Management: A Systematic Review and Meta-Analysis of Randomized Controlled Trials, Value Health 2022 Feb;25(2):288-301. doi: 10.1016/j.jval.2021.04.1285. Epub 2021 Oct 8.*
- 2. Christopher Rajendram 1, G Ken-Dror, et al: Efficacy of mirror therapy and virtual reality therapy in alleviating phantom limb pain: a meta-analysis and systematic review, BMJ Mil Health 2022 Apr;168(2):173-177. doi: 10.1136/bmjmilitary-2021-002018. Epub 2022 Jan 18.*

Newer Technologies for Pain Care

***"Energy Medicine is the Future of all  
Medical Care and Health"*** *Albert Ray, MD*

*Thank You for Your Attention  
Any Questions????*