Sensor-based Evidence of Effects
Linking Resolution with Photobiomodulation

Time-compressed “movie” (15min = 6 sec)
A whole body experience
in about a minute
The following potential conflict of interest relationships are germane to my presentation.

- I am an engineer. I am the founder, funder, & CEO of PhotoMed Technologies, Inc. (2000)

**Equipment from PhotoMed Technologies, Inc.**

- The equipment is labeled for investigational use only. It is not FDA cleared.

**Clinical illustrations**

- PhotoMed Technologies built the proprietary data acquisition system that captured the information presented.
Study Management System™

PDS 400® VW Generator

DeviceLogger™

Thermal Imaging Camera

PhotoMed’s integrated system for exploring wavelength-dependent effects
Vary the wavelength during therapy

- Range – 400 to 700 nm
- Rate of variation – 1 to 12 nm/sec
- ~ 25nm bandwidth (similar to an LED)
- 5 to 100mW/cm²
- 80 seconds typical
Linked coldness and pain

Coldness

Unrelenting Pain

Called sympathetically mediated pain, CRPS, or RSD
An iterative solution

Sessions that require iteration may suggest wavelength-dependent effects.
Thermostat Model

2 Minutes → Photobiomodulation

Persistent Coldness → Coldness → Restored Comfort

The warming phase is independent from the treatment parameters.
Each treatment is a separate experiment.

The healing process does not convey information about the treating parameters.
Synchronized Responses

Rapid and large physiological responses mark effective treatments
Feedback Enabled Process

Synchronized Warming - With Tracking Temperatures

Temperature (°C)

五分钟 = 11 秒
Subjects

- Subjects had multiple sources of pain
  - On pain medications, pumps, stimulators
  - Musculoskeletal pain
  - Neuropathies

- Sympathetically mediated pain (SMP) (CRPS, RSD)
  - Coldness linked with unrelenting pain

- Explore association and independence of disorders
Multi-dimensional Data Set

Optimization is at the individual and systems levels
Associated Disorders

Abnormal Skin Temperature Regulation

- Diabetic Peripheral Neuropathy
- Huntington's Chorea
- Small-fiber Neuropathy
- Stroke & Spinal Cord Injuries
- Limited ROM
- Shingles
- Non-healing Wounds
- Stiffness
- Muscle Pain and Spasm
- Migraines
- Sympathetically Mediated Pain

Identified through beneficial outcomes linked to observed changes in skin temperature during therapy

Sensor-based evidence – by impairment
Thank you

Allan Gardiner
PhotoMed Technologies, Inc.
65 Franciscan Way
Kensington, CA 94707 USA
510-541-9830 (Mobile)
allan@photomedtech.com
Reserve Slides

Allan Gardiner
PhotoMed Technologies, Inc.
510-541-9830 (Mobile)
allan@photomedtech.com
Wavelength selection

- Variable within 410 to 700nm
- 0 to 400Hz
- Dual fiber-optic cables

A motorized filter and chopper provided control of the wavelength and frequency to 1nm and 1Hz resolution.
Synchronized warming – Constant offset

50 YOF - Offset hand temperatures demonstrate the precision management of skin temperatures during perceived shift from coldness to comfort.
Synchronized warming

(19min = 11sec)

Click to start the movie.