

Balneology in Japan

**THE 70th GENERAL ASSEMBLY
AND
INTERNATIONAL SCIENTIFIC CONGRESS
OF THE WORLD FEDERATION OF HYDROTHERAPY AND CLIMATOTHERAPY
(FEMTEC)
ISCHIA PORTO (NAPLES, ITALY), 20171015~20**

**Shigeko Inokuma
Chiba Central Medical Center, Chiba, Japan
Ex-Chairman, Board**

**Japanese Society of Balneology, Climatology, and Physical Medicine
(BCPM)**

Ex-Chairman, Authorized Balneotherapist, BCPM

Today's topics

- A glance of Onsen in Japan
- Study on physiological effects of Onsen/functional water

Japanese Islands

Hot springs (Onsens) 27,405
Hot spring districts 3,159
Hot spring facilities 21,174
Visitors 126,422,229
(2014)

0 km 200

Active volcano

110/Japan (2012)

7% of 1500</World

Population (2014)

127,083,000

● 25°C<

○ <25°C

湯原浩三、瀬野錦蔵
温泉学 第7版
地人書館 東京、1985
p293

Onsen: hot spring in Japan

water 温 泉 7th C~
warm spring



Map symbol

1661 Originally appeared in an old map

1884~ Geospatial Information Authority of Japan

湯治

Toji: stay for Onsen-cure

Established in Edo period (1603-1868)

~3 weeks~

Mainly in agricultural/fishery off-season

Usually with neighborhood inhabitants



Empirical valuation during Toji custom

Onsen

For wound
For apoplexy

Ca Na Mg

For beauty

HCO_3^- Ca alkaline

For eye diseases

H_3BO_3 $\text{B}(\text{OH})_3$ Al

Modern balneology in Japan

1868 The Meiji Restoration

1912~ Army hospitals
National hospitals (Sanatorium)
University hospitals

1931~1951 6 national research institutes
for medical balneology

1935~ Japanese Society of Balneology, Climatology,
and Physical Medicine



~2002 All closed

Members of BCPM



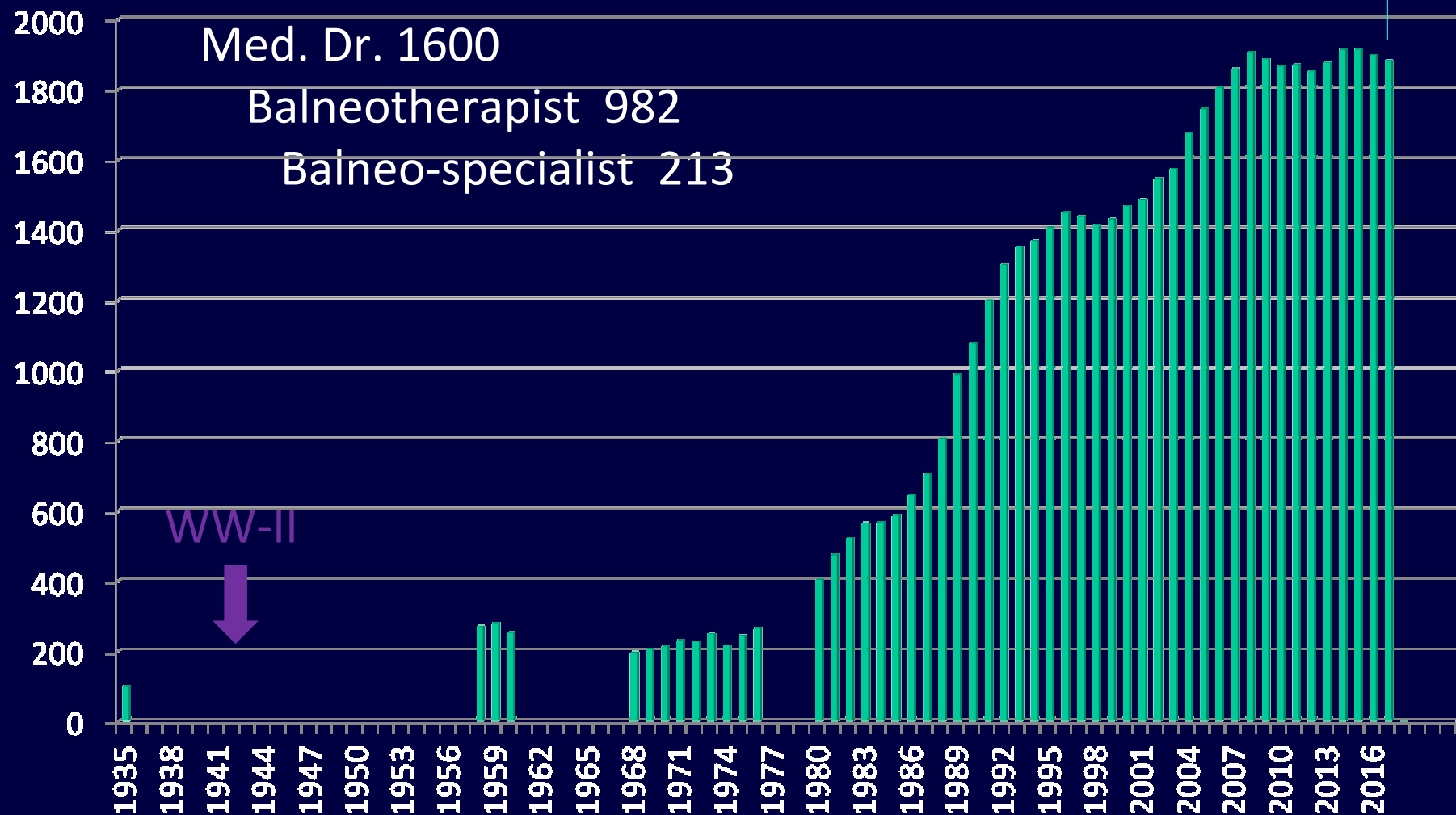
20170624

Member **1869**

Med. Dr. 1600

Balneotherapist 982

Balneo-specialist 213



BCPM
organized
39th ISMH
held in Kyoto
May, 2014



39th WORLD CONGRESS of
ISMH
X 79th BCPM
JOINT MEETING

Response of human body
to the nature

MAY 11-14, 2014 KYOTO, JAPAN
Venue : Kyoto International Conference Center
Takaragawa, Sakyo-ku, Kyoto, Japan

President : Shigeko Inokuma M.D.
Secretariat : ISMH2014
1-14-5 5F Kyobashi, Chuo-ku, Tokyo, Japan
TEL.03-3562-8020 FAX.03-3562-8030
E-mail : ismh-bcpm-2014@onk1.jp

www.ismh2014.com
ISMH (International Society of Medical Hydrology and Osmatology)

Major research fields in BCPM

Responses of human body to stimuli from the nature

stimuli include balneological, climatological, and physical ones

Hot & cold stimuli

Aquatic stimuli

Stimuli by components

Geological/climatological/environmental stimuli

Other physical stimuli (inc. acupuncture)

→ Diagnoses

→ Treatments

→ Health promotion (inc. national finance)

Recent research results reported in BCPM

Waon therapy

Heat shock protein therapy

Repetitive facilitative exercise

Peripheral circulation amelioration by CO₂ bathing

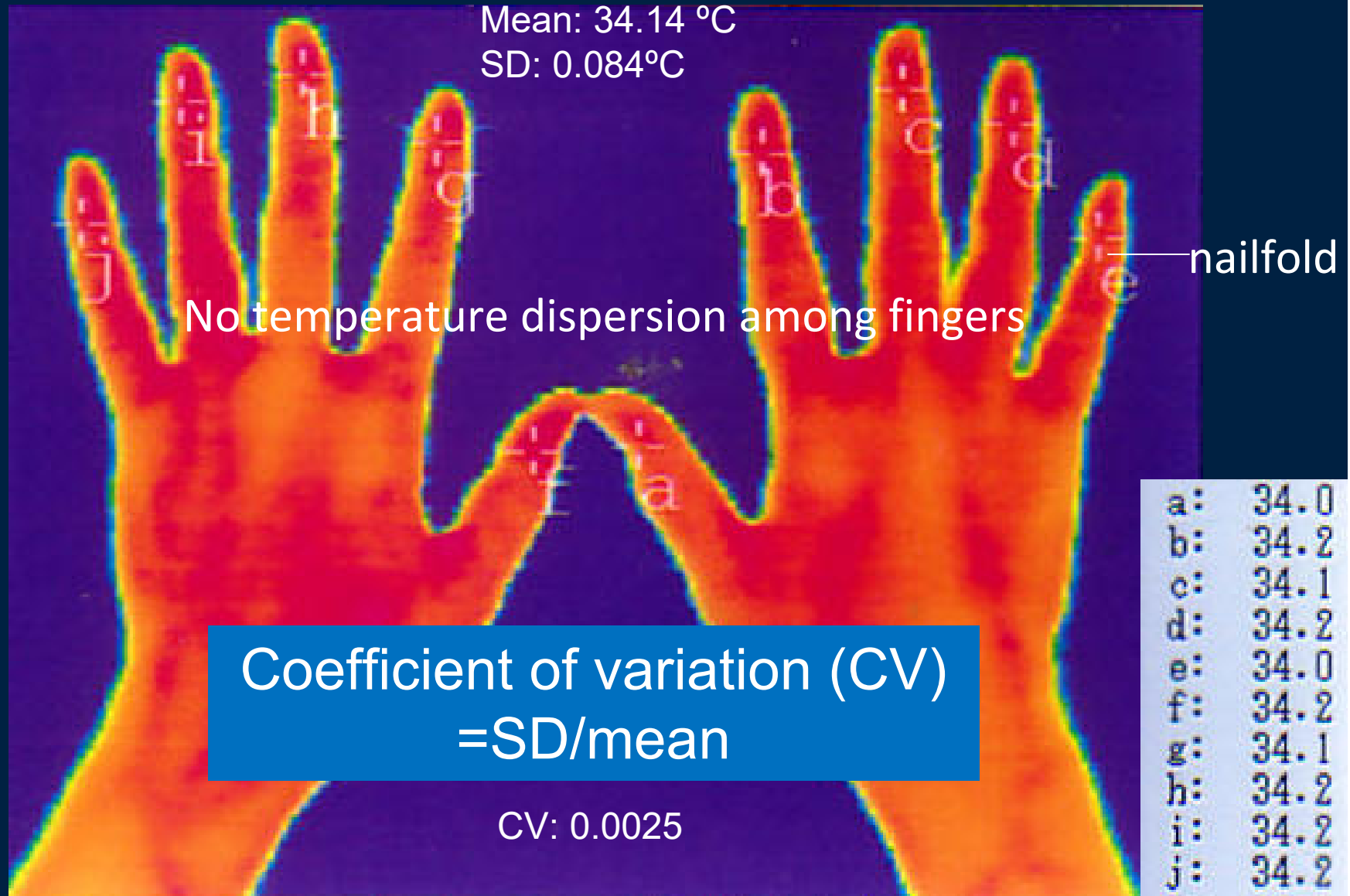
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● Thermal dispersion among fingers
in immunological diseases.

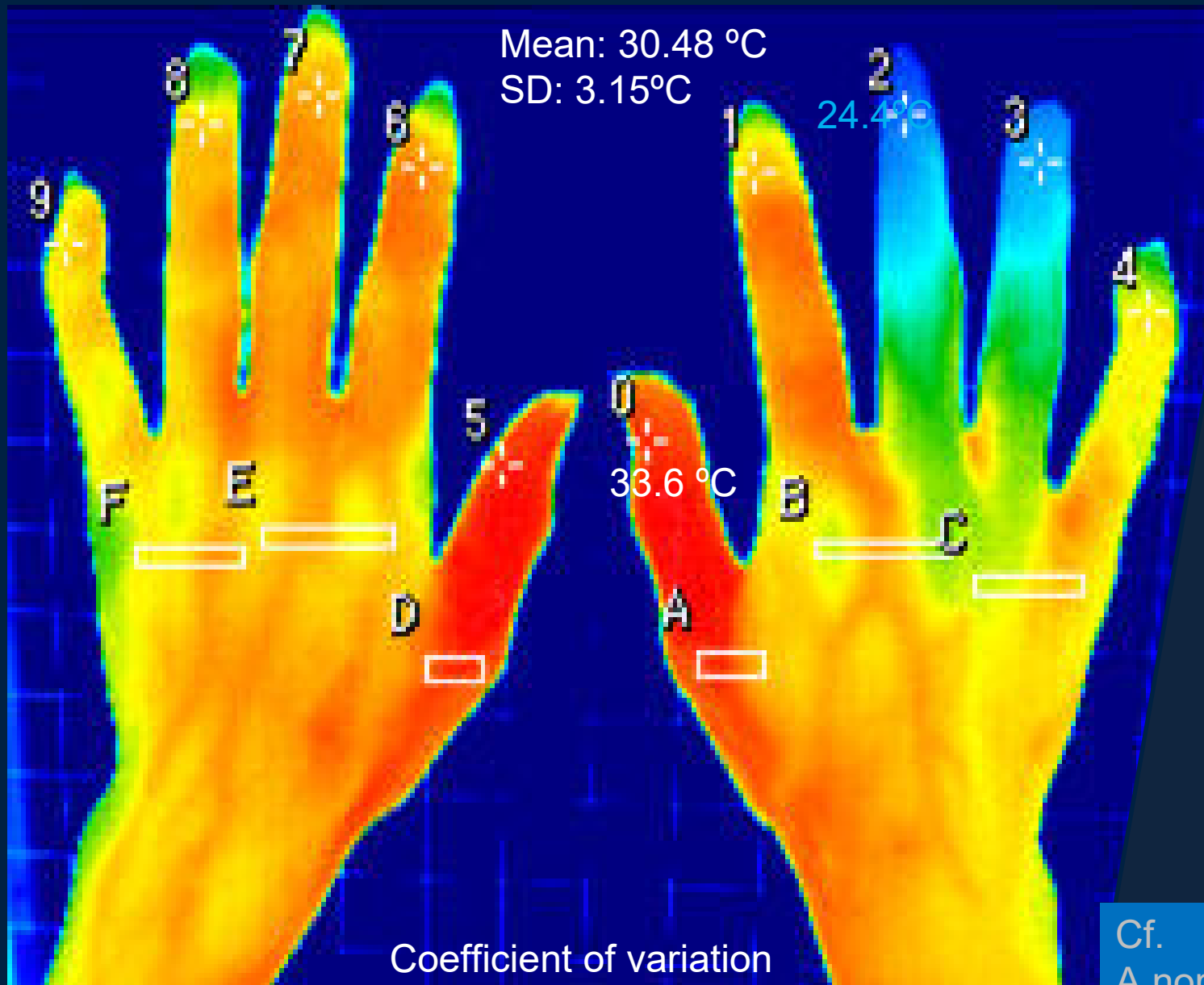
● Its amelioration
by warm Tap/CO₂ water bathing.

Normal volunteer

Mean: 34.14 °C
SD: 0.084°C



SSc patient



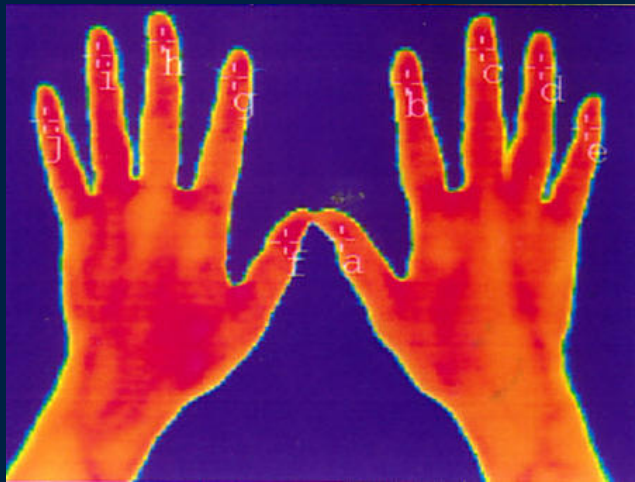
Coefficient of variation
(CV: SD/mean) : **0.1035**

Cf.
A normal control
CV: 0.0025

Temperature Dispersion

Normal
controls

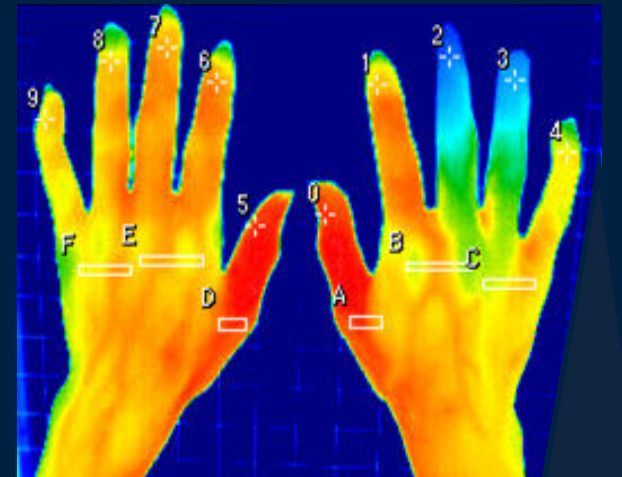
Mean: 34.14 °C
SD: 0.084°C



CV: 0.0025

CTD patient

Mean: 30.48 °C
SD: 3.15°C



CV: 0.1035

Amelioration of
temperature dispersion among fingers
by CO₂ bathing

Objective of the study

Does warming ameliorate

temperature dispersion (a high CV)?

If it does, is there any difference between

warm **tap** water

and

warm carbonated (**CO₂**) water?

Patients and Methods

Hands immersion in tap/CO₂ warm water

Patients :

CTD patients with suspected peripheral circulation disturbance

Hand immersion:

after acclimatization at 25°C for 15'

42 °C tap/CO₂ bathing for 10'

(Carbocell® MitsubishiRayonCleansui, Japan)

Temperature measurement:

at nail-fold and MCP-dorsum of each finger (20 points)

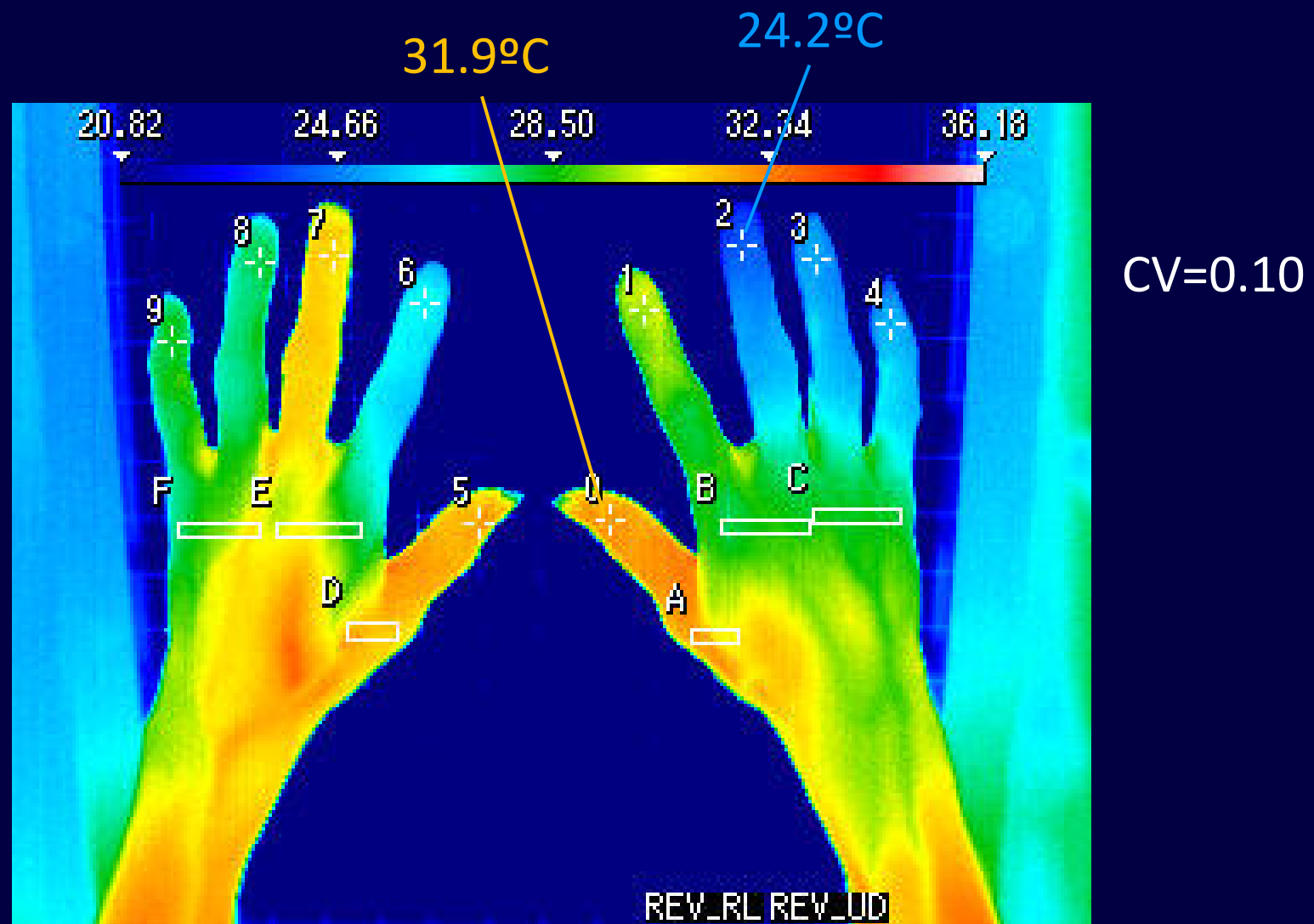
pre, 0', 3', 5', 10', 15', 20', 30' after immersion

Dispersion (Uneven temperature among fingers):

Coefficient of variation (CV)=SD/mean of 5 nail-folds

Mean of right and left CV was evaluated

Thermal dispersion in nailfolds



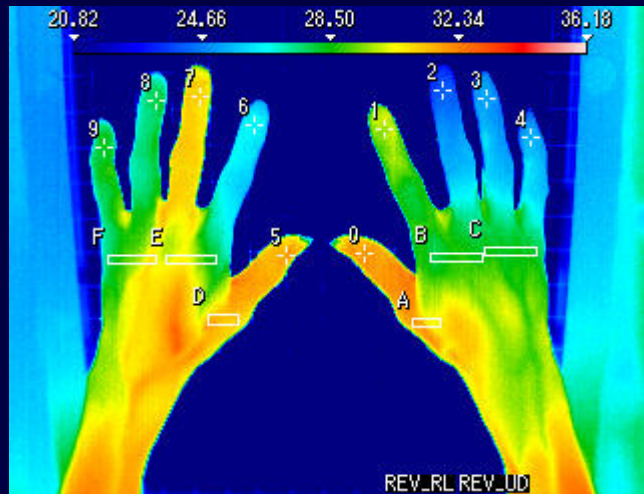
59y F, Raynaud

After acclimatization: 25°C 15'

Amelioration of thermal dispersion after CO_2 bathing

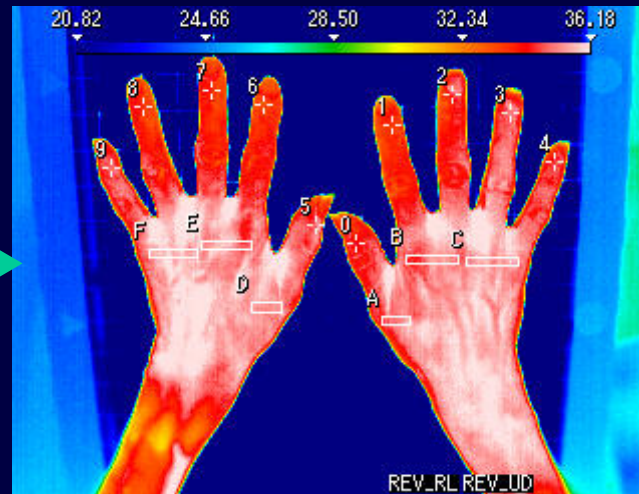
-10'

CV:0.10



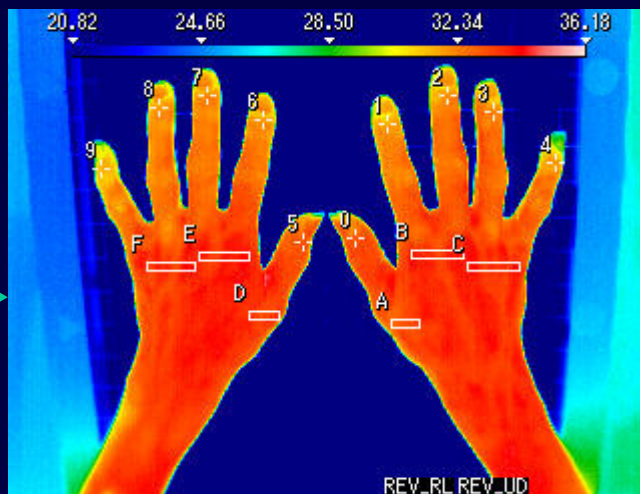
0'

CV:0.02



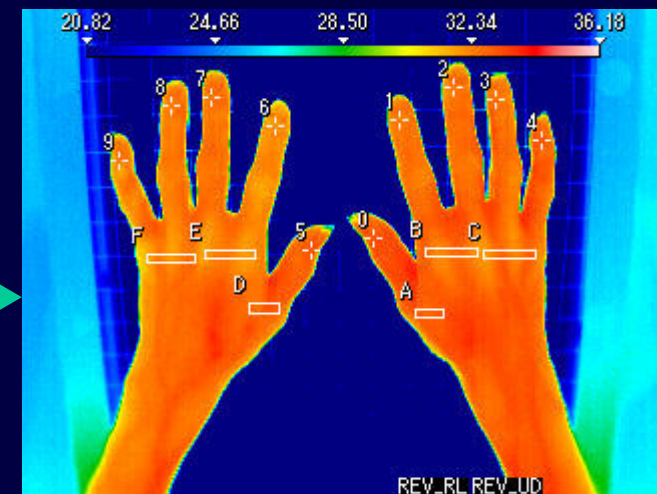
3'

CV:0.02

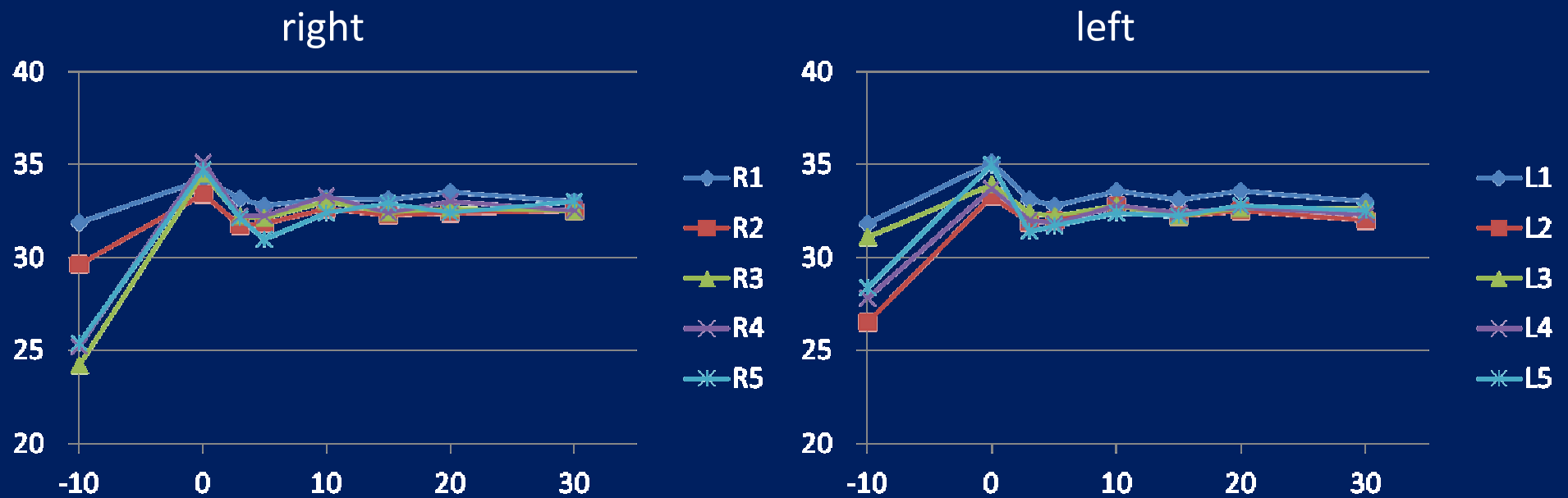


30'

CV:0.01

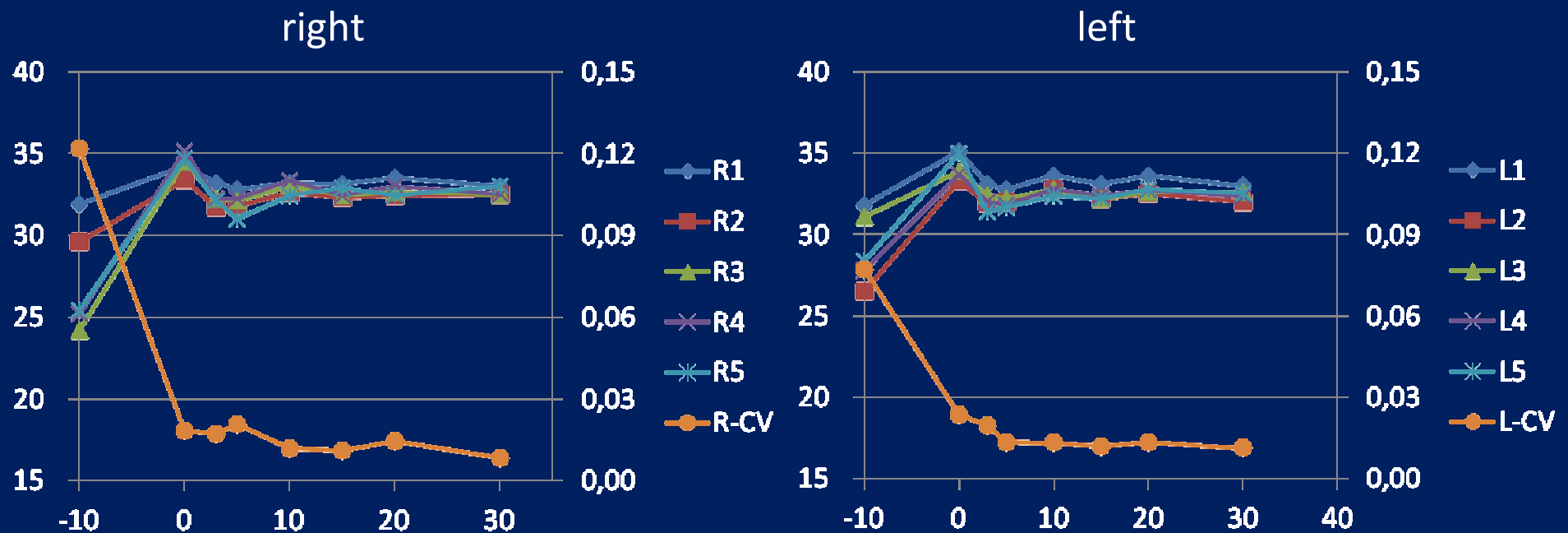


Amelioration of thermal dispersion after CO₂ bathing



59y F, Raynaud

Amelioration of thermal dispersion after CO₂ bathing

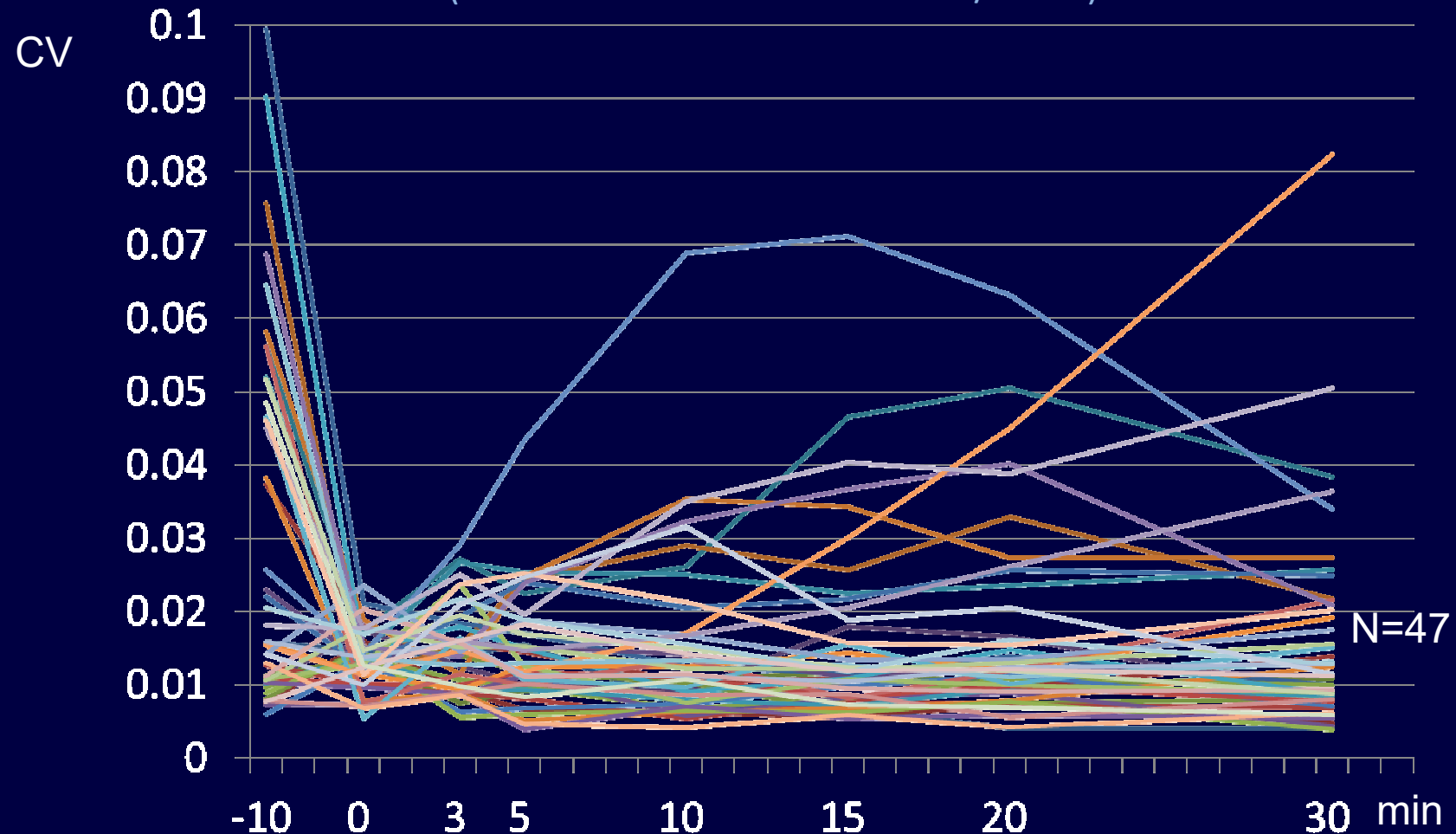


59y F, Raynaud

CV

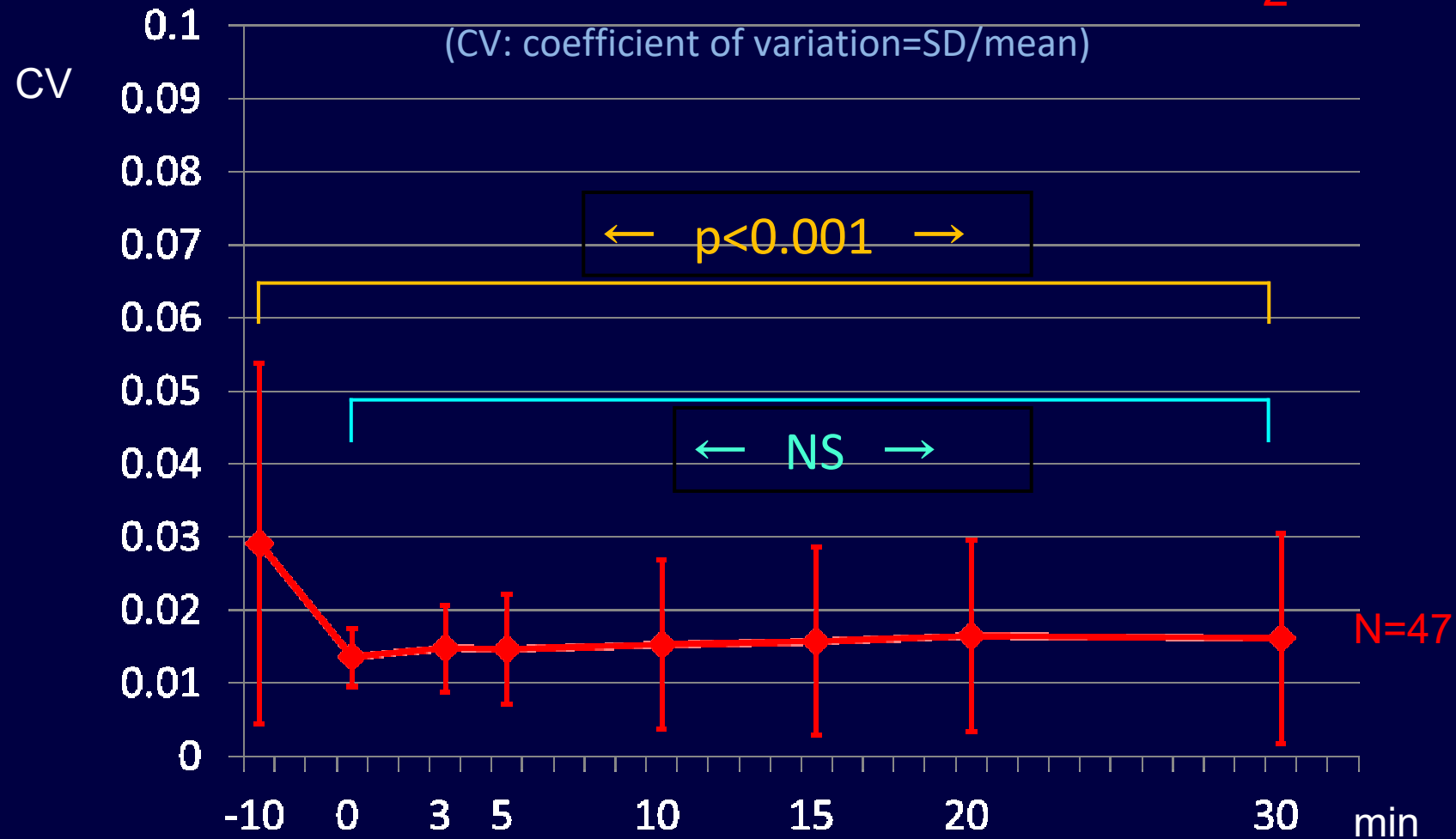
from before to after hand immersion in 42 °C CO₂ water

(CV: coefficient of variation=SD/mean)



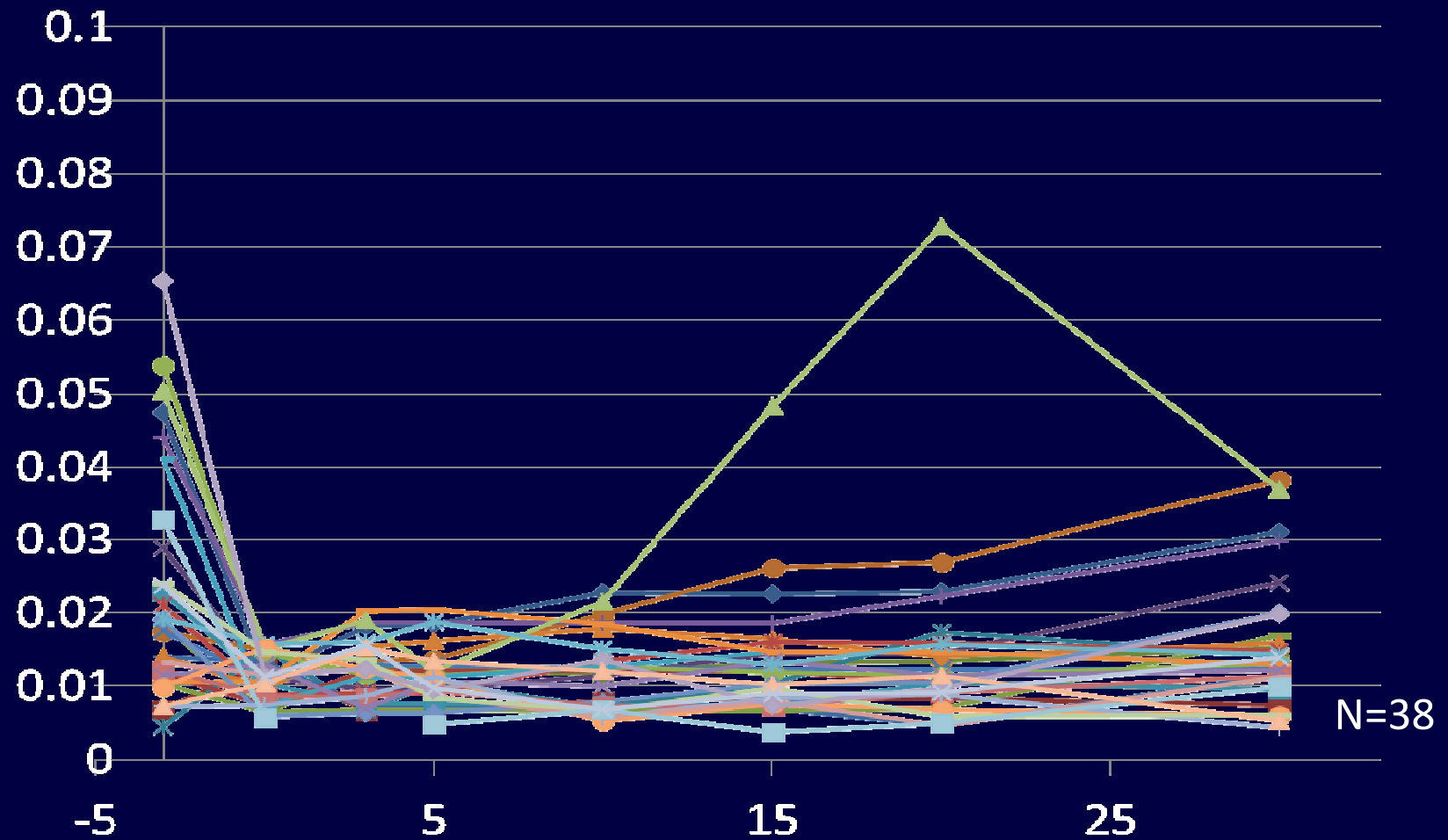
CV

from before to after hand immersion in 42 °C CO₂ water



CV decreased by CO₂ bathing, and was sustained low.

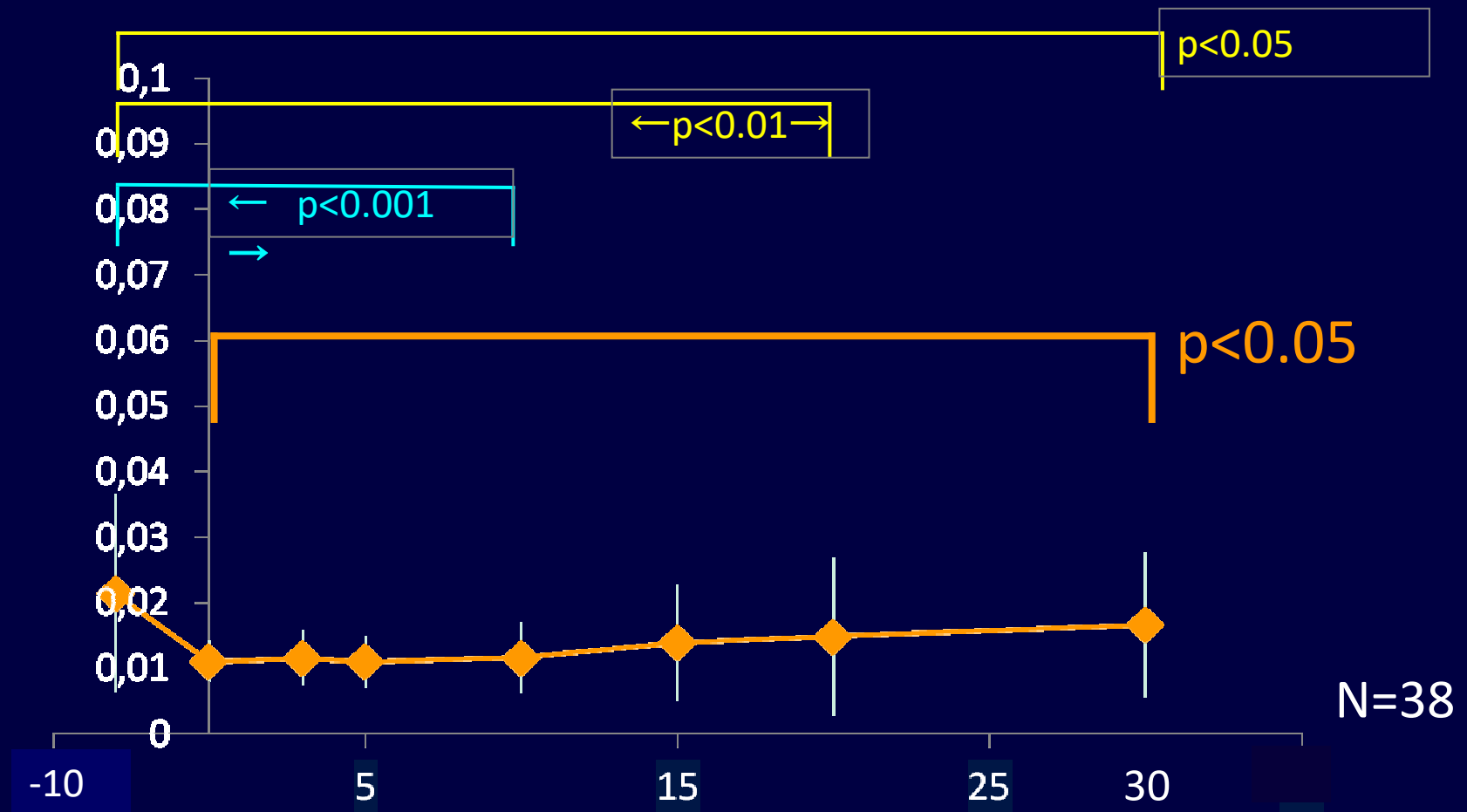
CV change after 42°C Tap water bathing



CV

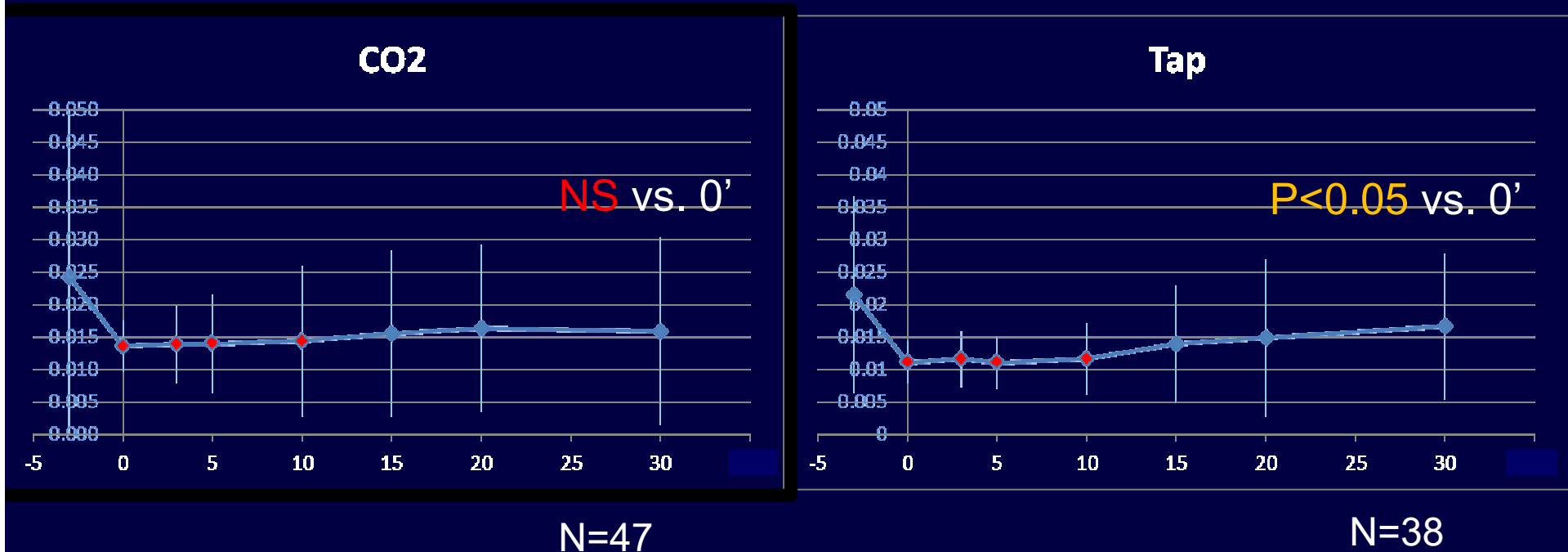
from before to after hand immersion in 42 °C Tap water

(CV: coefficient of variation=SD/mean)



CV tended to *re-increase* 30' after Tap water immersion

CV change after hands immersion in warm CO₂ vs. warm Tap water



*CV decrease was sustained after CO₂ bathing.
CV re-increased after Tap bathing.*

Conclusion

- Temperature dispersion among fingers were observed in patients with immunological diseases.
- The dispersion was ameliorated by hands immersion in 42°C warm water for 10'.
- By CO₂ water bathing, coefficient of variation (CV) decreased and was still sustained lower until 30' after bathing.
- By Tap water bathing, CV decreased once, but re-increased within 30' after bathing.

Thank you.