



# Medical Hydrology: education, training and certification

Pedro Cantista, MD, PhD



**ISMH**  
INTERNATIONAL SOCIETY  
OF MEDICAL HYDROLOGY  
& CLIMATOLOGY



**FEMTEC** since 1937

WORLD FEDERATION OF HYDROTHERAPY AND CLIMATOTHERAPY



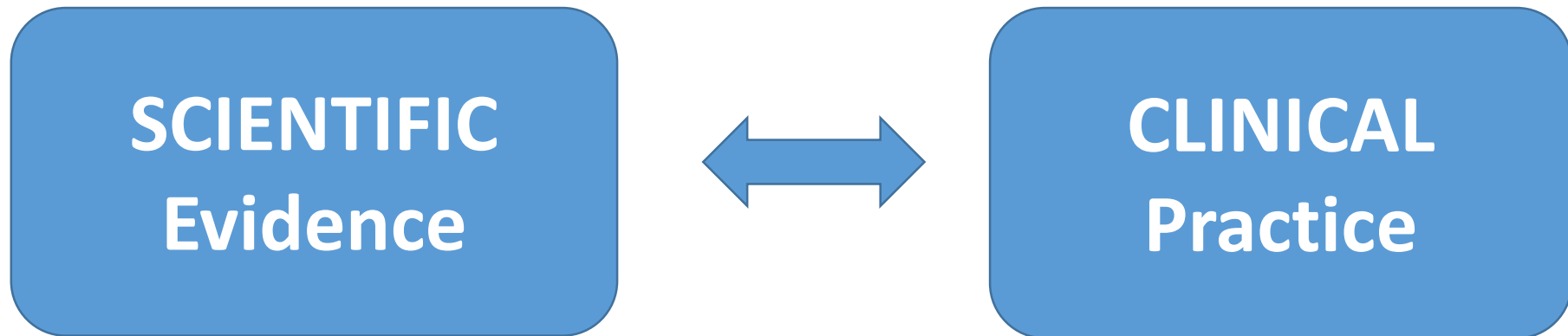
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# Evidence vs Clinical Practice on Balneotherapy:

- Analysis of the current situation





# BALNEOLOGY EFFICACY: LITERATURE EVIDENCE AND CLINICAL EXPERIENCE (Systematic review)



Cantista, Pedro \*, \*\*, MD, PhD ,  
Zão, Ana, MD \*

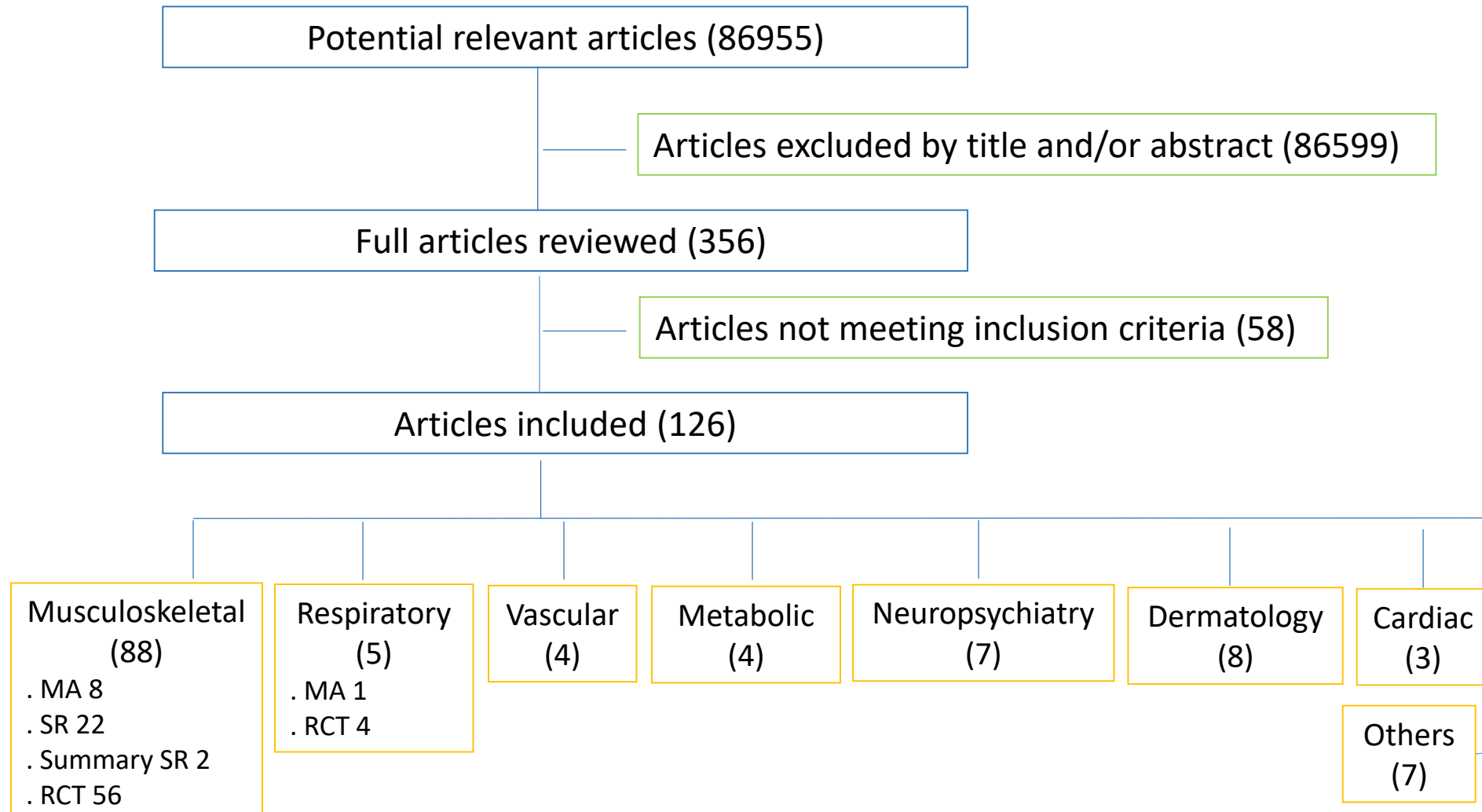


\* Physical and Rehabilitation Medicine Department, Centro Hospitalar do Porto, Porto, Portugal

\*\* Universidade do Porto – Instituto de Ciências Biomédicas Abel Salazar

# Results:

**Flow chart illustrating the literature search and evaluation.**



# Results:

Disorders							
Musculoskel (88)	Respiratory MA 1 . RCT 4	Vascul (4)	Metabol (4)	Neuropsychi (7)	Dematol (8)	Cardiac (3)	Others (7)



Musculoskeletal disorders	Meta-analysis	Summary of SR	Syst reviews (SR)	RCT
Osteoarthritis	3	1	9	32
Knee	2	1	9	28
Hand	1			4
Low back pain	2	1	3	11
Neck pain				2
Shoulder pain				1
Fibromyalgia	2	1	6	9
Rheumatic inflammatory diseases	1		8	12
Rheumatoid arthritis			3	8
Ankylosing spondylitis				



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# Medical Balneology----EVIDENCE

**Search string:** "hydrotherapy" [Mesh] or "spa therapy" [Mesh] or "balneotherapy" [Mesh] or "mineral water" [tiab] or "therapeutic spa" [tiab] or "sulfurous water" [tiab] or "aqua therapy" [tiab]

NIH National Library of Medicine  
National Center for Biotechnology Information

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PubMed.gov

"hydrotherapy" [Mesh] or "spa therapy" [Mesh] or "balneotherapy" [Mesh] or "mineral water" [tiab] or "therapeutic spa" [tiab] or "sulfurous water" [tiab] or "aqua therapy" [tiab]

Advanced Create alert Create RSS Search User Guide

Save Email Send to Sorted by: Best match Display options

MY NCBI FILTERS

2,429 results

Filters applied: Meta-Analysis, Multicenter Study, Observational Study, Randomized Controlled Trial, Review, Systematic Review, from 2000/1/1 - 2022/9/15. Clear all

Quoted phrases not found in phrase index: "spa therapy", "balneotherapy"

RESULTS BY YEAR

2000 2022

Efficacy of aquatic **therapy** for multiple sclerosis: a systematic review.  
1 Corvillo I, Varela E, Armijo F, Alvarez-Badillo A, Armijo O, Maraver F.  
Cite Eur J Phys Rehabil Med. 2017 Dec;53(6):944-952. doi: 10.23736/S1973-9087.17.04570-1. Epub 2017 Feb 17.



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## Medical Balneology----EVIDENCE COMING FROM SYSTEMATIC REVIEWS



International Journal of  
*Environmental Research  
and Public Health*

2021;18(24):13216.



Systematic Review

### Therapeutic Benefits of Balneotherapy on Quality of Life of Patients with Rheumatoid Arthritis: A Systematic Review

Maria Fernandez-Gonzalez <sup>1</sup>, Carolina Fernandez-Lao <sup>1,2,3,\*</sup>, Lydia Martin-Martin <sup>1,2,3,\*</sup>,  
Angela Gonzalez-Santos <sup>1,2,3</sup>, Maria Lopez-Garzon <sup>1,2,3</sup>, Lucia Ortiz-Comino <sup>1,2,3</sup> and  
Mario Lozano-Lozano <sup>1,2,3</sup>

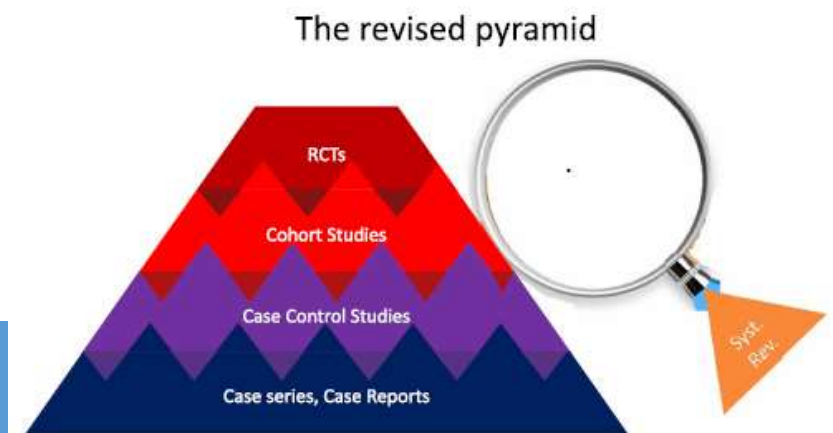
**Beneficial effects on quality of life for both mineral bathing and also immersion in sand or mud.**

Spa therapy and knee osteoarthritis: A systematic review

Romain Forestier <sup>a,\*</sup>, Fatma Begüm Erol Forestier <sup>b</sup>, Alain Francon <sup>a</sup>

**Annals of Rehabilitation Medicine 2016;59:216-226.**

**Balneotherapy (hot mineral water baths, mud therapy, hot showers, and sometimes massage and supervised water exercises) seem to improve symptoms with possible favourable effects on pain and function in knee OA.**



Negrini S. Evidence in Rehabilitation Medicine: Between Facts and Prejudices. Am J Phys Med Rehabil. 2019;98(2):88-96.





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# Medical Balneology----EVIDENCE COMING FROM SYSTEMATIC REVIEWS

International Journal of Biometeorology (2022) 66:13–23  
<https://doi.org/10.1007/s00484-021-02188-9>

REVIEW PAPER

**Crenobalneo-therapy for low back pain: systematic review of clinical trials**

R. Forestier<sup>1</sup> · A. Fioravanti<sup>2</sup> · T. Bender<sup>3</sup> · I. Santos<sup>4</sup> · F. B. Erol Forestier<sup>1</sup> · A. Muela Garcia<sup>1</sup> · A. Françon<sup>1</sup>

Potential beneficial effects in chronic low back pain; being superior to the waiting list in terms of pain, function, and sometimes quality of life in some of the studies.

International Journal of Biometeorology (2020) 64:2195–2203  
<https://doi.org/10.1007/s00484-020-01988-9>

REVIEW PAPER

**Spa therapy and burn scar treatment: a systematic review of the literature**

Camille Gravelier<sup>1</sup> · Gisèle Kanny<sup>2</sup> · Sorin Adetu<sup>3</sup> · Laetitia Goffinet<sup>3</sup>



Journal of *Clinical Medicine* 2021;10(7):1493.



Review

**Balneo-therapy for Fibromyalgia Syndrome: A Systematic Review and Meta-Analysis**

Chun-Feng Cao<sup>1,†</sup>, Kun-Long Ma<sup>1,†</sup>, Qian-Lu Li<sup>2</sup>, Fu-Jun Luan<sup>1</sup>, Qun-Bo Wang<sup>1</sup>, Ming-Hua Zhang<sup>1</sup>, Omar Viswanath<sup>3,4,5,6</sup>, Dariusz Myrcik<sup>7</sup>, Giustino Varrassi<sup>8,\*</sup> and Hai-Qiang Wang<sup>9,\*</sup>

Very low to moderate evidence indicates that balneo-therapy can be beneficial in fibromyalgia syndrome in terms of pain and quality-of-life.



Review

**Efficacy of hydrotherapy, spa therapy, and balneo-therapy for psoriasis and atopic dermatitis: a systematic review**

Arezoo Moini Jazani MD, PhD, Mohammad Hossein Ayati MD, PhD, Ata Allah Nadiri PhD, Ramin Nasimi Doost Azgomi MD, PhD

Sleep and spa therapies: What is the role of balneo-therapy associated with exercise? A systematic review

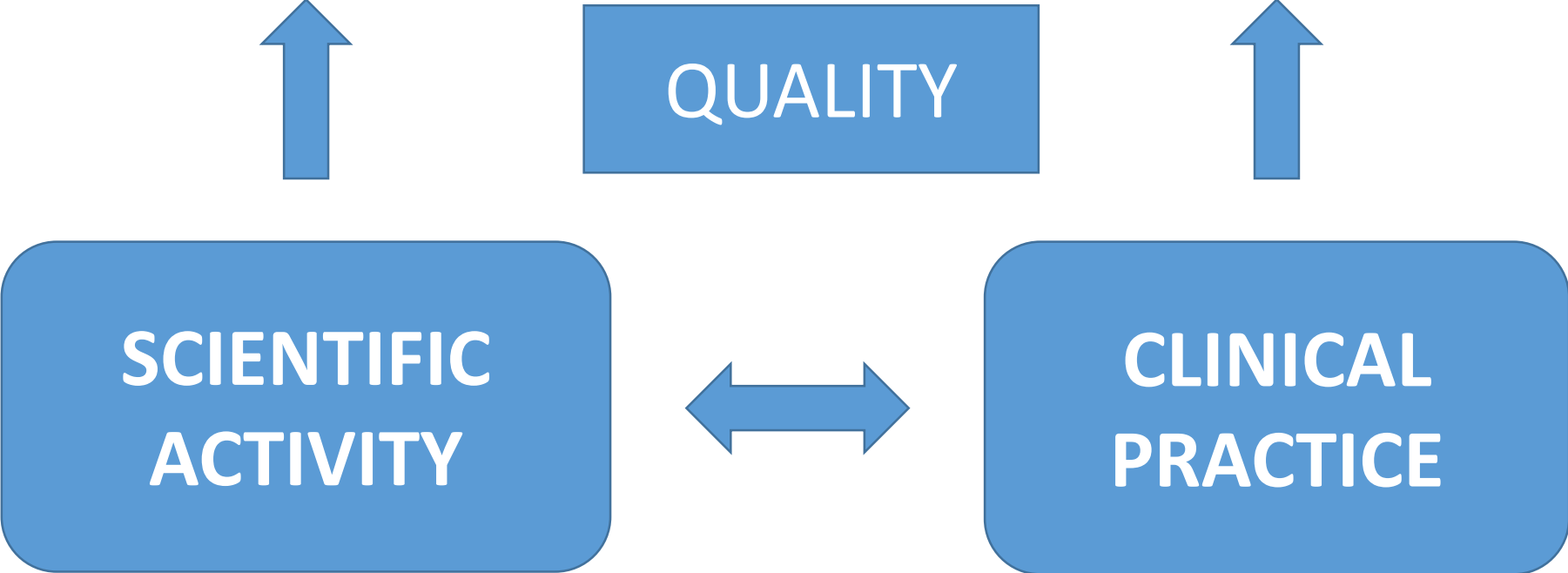
Lucia Castelli<sup>1</sup>, Letizia Galasso<sup>1</sup>, Antonino Mulè<sup>1\*</sup>, Andrea Ciorciari<sup>1</sup>, Francesca Fornasini<sup>2</sup>, Angela Montaruli<sup>1,3</sup>, Eliana Roveda<sup>1,3†</sup> and Fabio Esposito<sup>1,3†</sup>

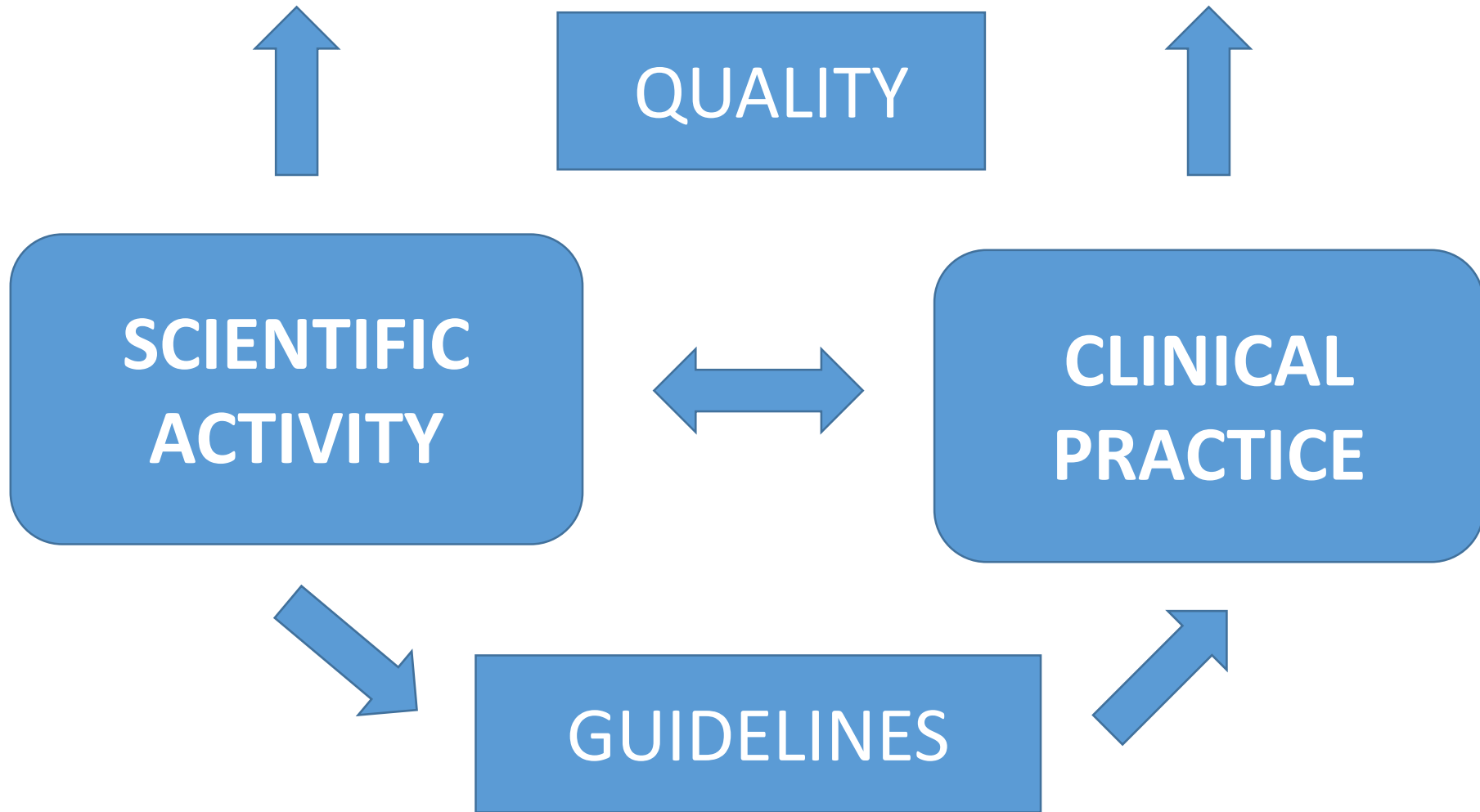
Front Physiol. 2022;13:964232.

# Conclusion

- The efficacy observed on clinical practice, mainly reported by Balneology doctors, is corroborated by significant evidence of the literature.

**Balneotherapy** should be considered a **relevant therapy modality** in several conditions, namely musculoskeletal disorders and should be included as part of the treatment program.







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# Balneotherapy in GUIDELINES

## Recommendations

**EXTENDED REPORT** Macfarlane GJ et al. Ann Rheum Dis. 2017;76(2):318-328.

## EULAR revised recommendations for the management of fibromyalgia

Defined physical therapies: acupuncture or hydrotherapy

1a

A

Weak for

93

Hydrotherapy/spa therapy

ITT analysis. There was consistency with regard to the evidence for hydrotherapy and balneotherapy, although little evidence to suggest superiority of one over the other.<sup>77</sup> *Hydrotherapy evaluation: weak for (93% agreement).*



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# Balneotherapy in GUIDELINES

## Osteoarthritis and Cartilage



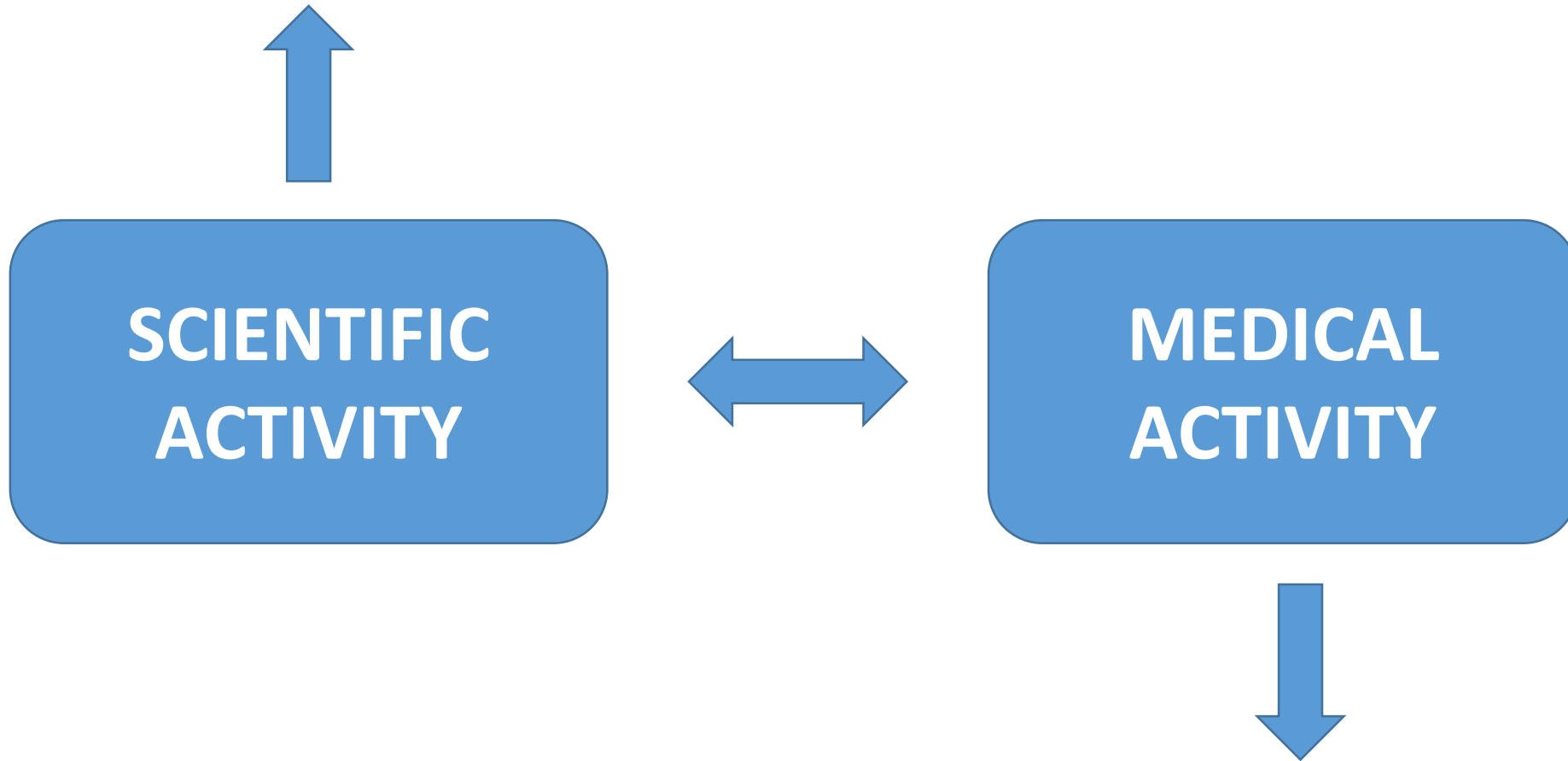
OARSI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis



Bannuru RR et al. Osteoarthritis Cartilage. 2019;27(11):1578-1589.

Recommended treatments, by level, for knee osteoarthritis

Recommendation level	Strength	Treatment type	No comorbidities	Gastrointestinal	Cardiovascular	Frailty	Widespread pain/depression
<b>CORE</b>	Strong	Arthritis Education; Structured Land-Based Exercise Programs (Type 1- strengthening and/or cardio and/or balance training/neuromuscular exercise OR Type 2- Mind-body Exercise including Tai Chi or Yoga) with or without Dietary Weight Management					
<b>Level 1A High Consensus</b> ≥75% "in favor"	Strong	Pharmacologic Non-Pharmacologic	Topical NSAIDs <i>refer to Level 1B</i>	Topical NSAIDs <i>refer to Level 1B</i>		Topical NSAIDs <i>refer to Level 1B</i>	<i>refer to Level 1B</i> <i>refer to Level 1B</i>
<b>Level 1B High Consensus</b> ≥75% "in favor" & >50% "conditional" <i>Recommendation</i>	Conditional	Pharmacologic  Non-Pharmacologic	<ul style="list-style-type: none"> <li>Non-selective NSAIDs</li> <li>Non-selective NSAID + PPI</li> <li>COX-2 Inhibitors</li> </ul> IACS <b>Aquatic Exercise</b> , Gait Aids, Self-Management Programs	COX-2 Inhibitors IACS, IAHA  <b>Aquatic Exercise</b> , Gait Aids, Self-Management Programs	IACS, IAHA	IACS, IAHA	<ul style="list-style-type: none"> <li>Non-selective NSAIDs</li> <li>Non-selective NSAID + PPI</li> <li>COX-2 Inhibitors</li> </ul> <b>Aquatic Exercise</b> , Cognitive Behavioral Therapy (with or without Exercise),



What could explain this?



# There is enormous diversity in Thermal Medicine

- Balneology has many approaches depending on the country
- Tradition, cultural aspects
- Acceptance and medical recognition
- Medical / non-medical use
- Therapeutic / leisure activity
- Education programs, certification rules
- Facilities, equipment, professionals, operating models
- Legal aspects

How can we overlap this situation?

**Primary objective**

We need MORE  
Thermal DOCTORS

# We need Consensus at European level

- scientific
- educational
- organization of medical care
- Hence the need to establish a common policy also for health.

# The thermal prescription must remain a medical act

- Here is his definition adopted on the occasion of the UEMS council meeting in Munich on October 21 - 22, 2005:
- *"The medical act includes all professional actions, e.g. scientific, teaching, training and pedagogical, clinical and medico-technical approaches, carried out in order to promote health, prevent diseases, provide diagnostics, therapeutics or health care AND rehabilitation to patients, individuals, groups or communities and is the responsibility of a recognized medical doctor and must always be performed by him or under his direct supervision and/or prescription."*

# We need a European level of medical regulation

- Standards and Ethics
- Education
- Certification and registration
- training and practice

European diploma



# EUROPEAN BOARD - 2014

- EUROPEAN STANDARDS
- FELLOWSHIP
- CERTIFICATION

A dynamic background of white water splashes and droplets against a solid blue background. The splashes are concentrated in the upper half of the image, with some smaller droplets scattered throughout. A semi-transparent white horizontal band is positioned across the middle of the image, serving as a backdrop for the text.

# VII CONGRESSO INTERNACIONAL SOC. PORTUGUESA DE HIDROLOGIA MÉDICA

*“iter aqua in europam”*







## EUROPEAN BOARD OF MEDICAL HYDROLOGY



## EUROPEAN BOARD OF MEDICAL HYDROLOGY

### SIGNATORIES

### MINUTES OF FOUNDATION

*On the 7th day of June 2014 at the Bussaco Palace in Portugal, all the following signatories agree in founding the “European Board of Medical Hydrology”.*

*By the creation of this European Fellowship they intend to implement good quality standards in this discipline based on a solid scientific and clinical preparation of the Hydrologist doctors in order to defend good care for all the people that may need their assistance .*

	<b>FRANCE</b>
	<b>GERMANY</b>
	<b>HUNGARY</b>
	<b>ITALY</b>
	<b>POLAND</b>
	<b>PORTUGAL</b>
	<b>ROMANIA</b>
	<b>SERBIA</b>
	<b>SPAIN</b>
	<b>TURKEY</b>

# Cooperation





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# UEMS PRM Section and Board Proposal: Creation of a MJC in Medical Balneology

**Mauro Zampolini**

UEMS PRM Section President

UEMS COUNCIL

October 7-8, 2022

Athens, Greece



UEMS PRM Section and Board

### What is Medical Balneology?

A medical field of the use of balneological agents (thermal mineral waters, peloids/muds and gases) for human health to prevent, treat and rehabilitate the health conditions

Medical Hydrology (and Climatology)    Thermal (Spa) Medicine    Health Resort (Kurort) Medicine

Balneological interventions

- Hydrotherapy
- Peloidotherapy
- Hydrotherapy
- Hydropinotherapy
- Aquatic therapy
- Inhalation
- Hydrokinesotherapy

GREECE





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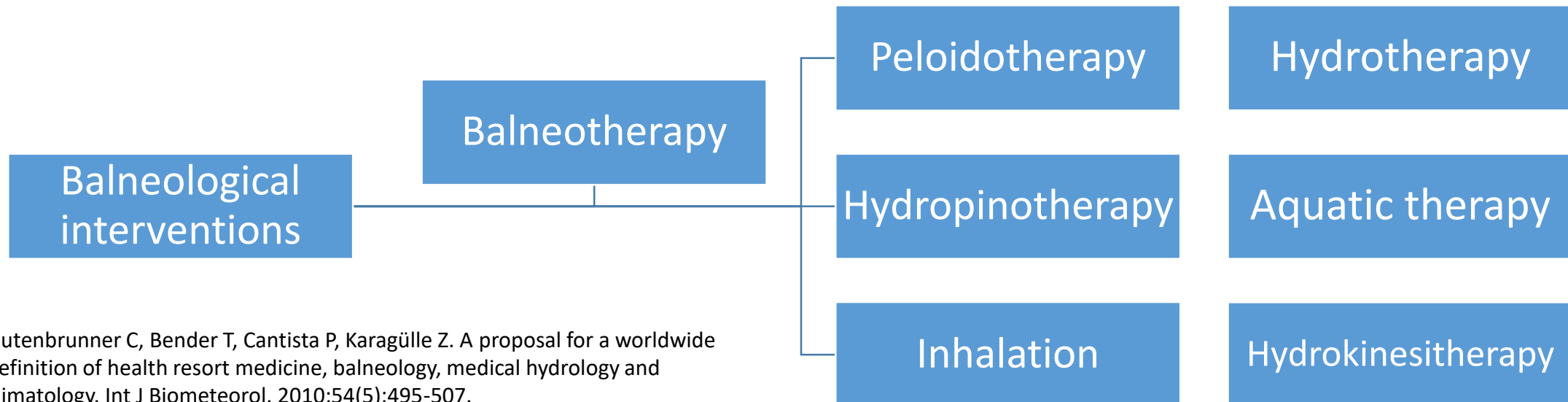
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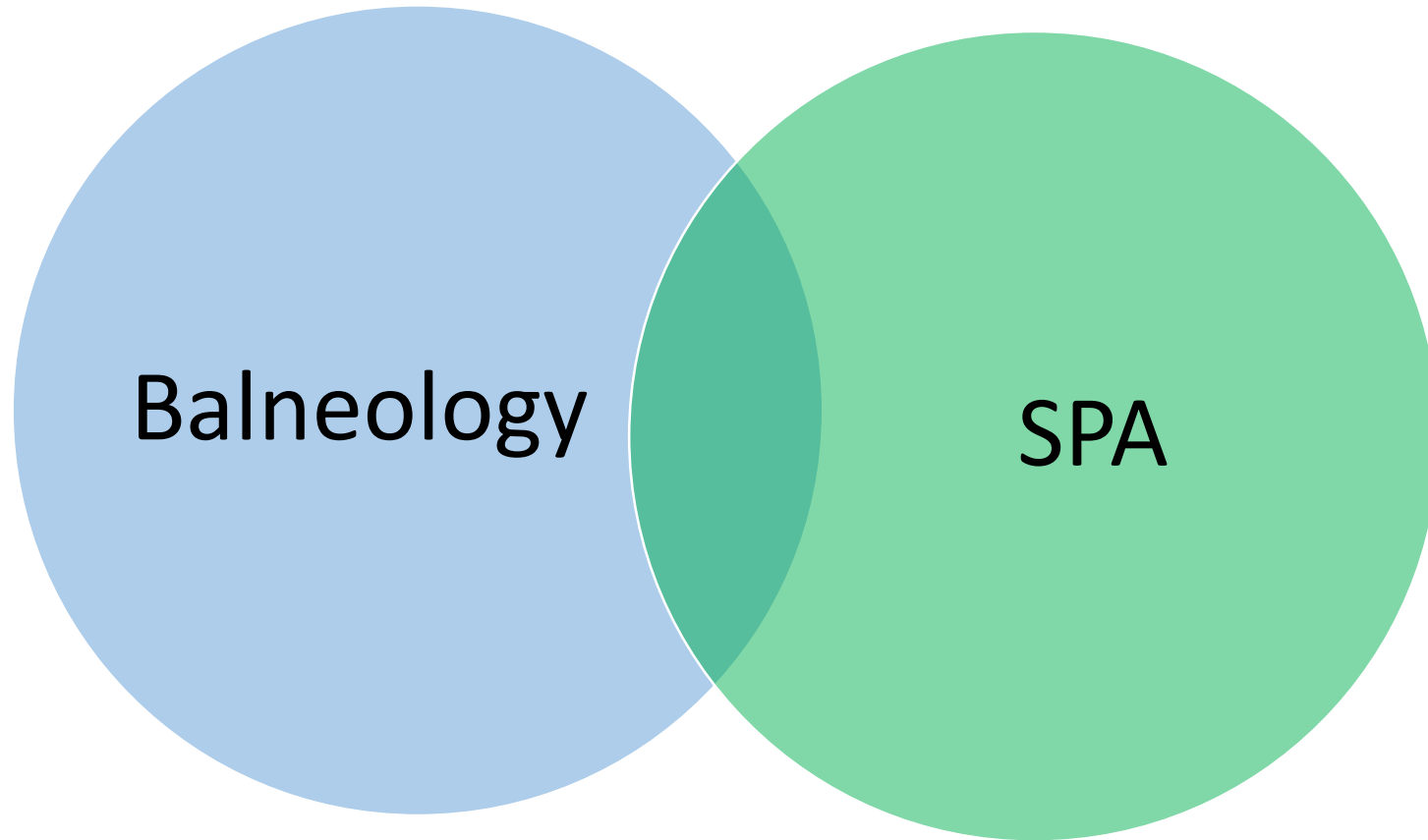
Thermal (Spa) Medicine

Health Resort (Kurort) Medicine

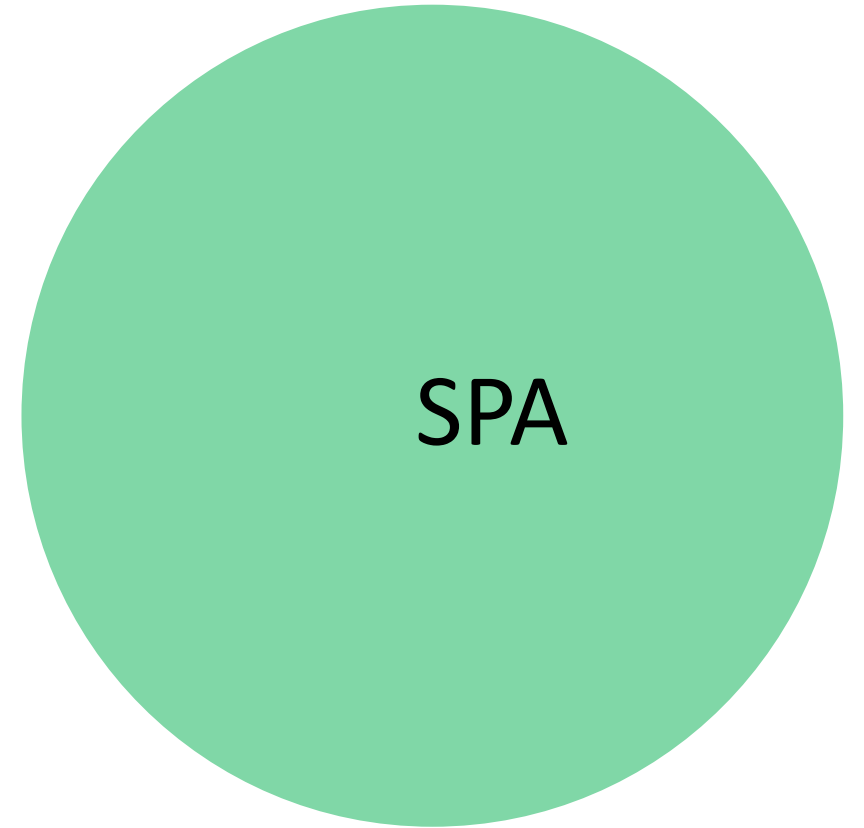


Gutenbrunner C, Bender T, Cantista P, Karagülle Z. A proposal for a worldwide definition of health resort medicine, balneology, medical hydrology and climatology. Int J Biometeorol. 2010;54(5):495-507.

# Balneology isn't a SPA



# Balneology isn't a SPA



# Medical Balneology and Physical and Rehabilitation Medicine (PRM)



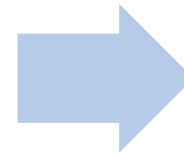
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A Taskforce on Balneology



Balneology Subdivision within the  
UEMS PRM Section

Created in 2005

Since 12 years





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# Medical Balneology and European Countries

### Independent main competency

- Italy
- Spain
- Turkey

### Competency or additional qualification

- Austria
- Czech Republic
- France
- Germany
- Hungary
- Portugal
- Serbia

### Included within the specialty of PRM

- Poland
- Romania
- Slovak Republic

Gutenbrunner C, Bender T, Cantista P, Karagülle Z. A proposal for a worldwide definition of health resort medicine, balneology, medical hydrology and climatology. *Int J Biometeorol.* 2010;54(5):495-507.

### Not recognized as a medical competency or qualification

- Denmark
- Sweden
- The Netherlands



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### The need for a MJC in Medical Balneology

This medical field is not represented in the UEMS

Clear definitions of balneological treatments

Standardization of terminology

Recent scientific evidence and developments in the field

### Potential outcomes of the MJC

Scientific development of medical balneology

Collaborative actions in medical balneology with other medical specialties

Better introduction to modern medical research and technology

A training curriculum for medical balneology

# EUROPEAN SCHOOL OF BALNEOLOGY







BALNEÁRIO  
PERMANENTE DE  
INVESTIGAÇÃO E  
DESENVOLVIMENTO  
DE PRÁTICAS  
TERMAIS DE MINAS



# AQUANET

European Mineral Water Research, Innovation and Valorisation Network

## AQUAFORUM

European Mineral Water Research, Innovation and Valorisation Forum'21

18<sup>th</sup>-19<sup>th</sup> June 2021, Chaves, Portugal



## What is AQUANET?

- A collaborative network, established at the European level, between some of the most relevant stakeholders of the mineral water sector.

## Objectives

- Triggering and conducting top level scientific research;
- Innovation, knowledge and technology transfer on mineral water and the directly inherent scopes.



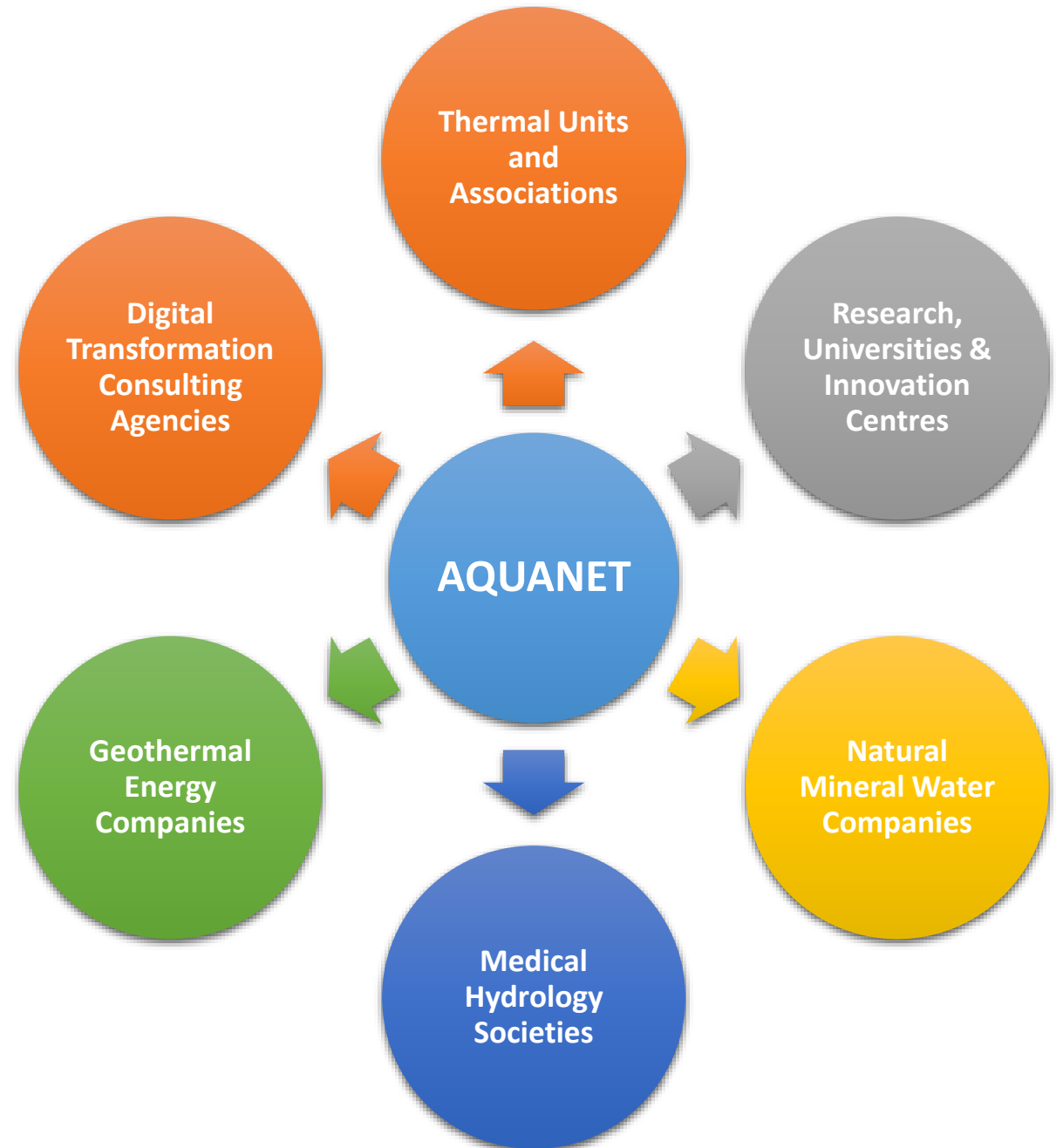
## MISSION

- Implement cutting edge scientific research in order to be internationally recognized as a network of experts on mineral water;
- This network will have a powerful and cooperative ability to foster innovation and development of novel solutions and uses of this resource;
- Collaborative partnership, established at European level, between some of the most relevant stakeholders of mineral water.

## ASSIGNMENTS

- Develop both theoretical and practical research activities;
- Establish thematic partnerships to apply for funding to solve specific issues;
- Idealize potential future usages of mineral water.

# ***NETWORK MEMBERS***







Thank you very much !

[pedro.cantista@gmail.com](mailto:pedro.cantista@gmail.com)