



Athens

5-7 October 2023

The role of IA treatment to improve “Self-Healing” in the management of musculoskeletal disorders

Ali Mobasheri



UNIVERSITY OF OULU



Inovatyvios medicinos centras



LIÈGE
université



QARSI
OSTEOARTHRITIS
RESEARCH SOCIETY
INTERNATIONAL



Athens

5-7 October 2023

The holistic role of “Self-Healing” to improve outcomes of IA treatment in the management of OA

Ali Mobasheri



UNIVERSITY OF OULU



LIÈGE
université



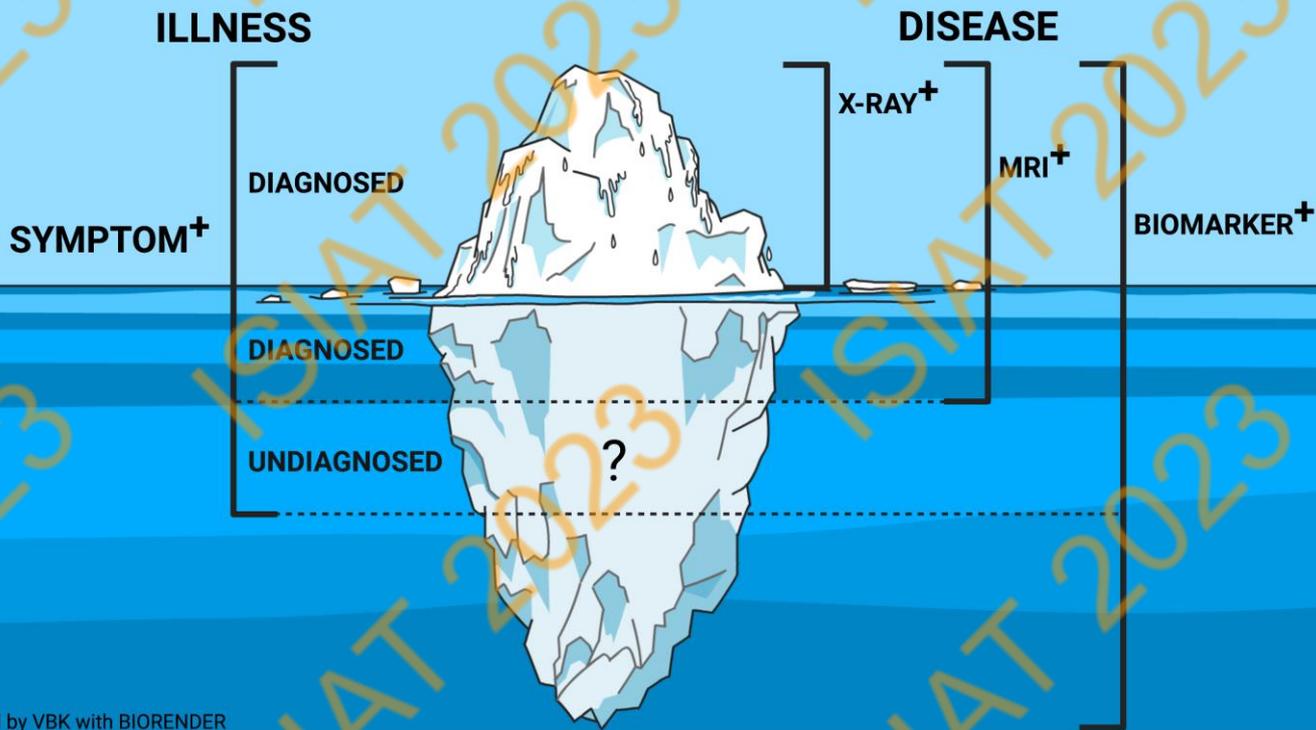
QARSI
OSTEOARTHRITIS
RESEARCH SOCIETY
INTERNATIONAL



Athens

5-7 October 2023

THE OSTEOARTHRITIS 'ICEBERG'



Virginia **BYERS KRAUS**

Professor of Medicine,
Pathology and
Orthopaedic Surgery at
Duke University

7th

International
Symposium
Intra
Articular
Treatment



Athens

5-7 October 2023

Grade 1



Initial joint
space narrowing

Grade 2



Increased joint
space narrowing

Grade 3



Progressive joint
space narrowing

Grade 4



Bone-on-Bone

**Kellgren
& Lawrence
Grade¹**

Patient Ratio

X %

Y %

Z %

Duration

X years

Y years

Z years

**Current
Treatment
Paradigm**



Non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids,
hyaluronic acid (HA), COX2 inhibitors, sysadoas

Temporary pain relief

(need for frequent repeat administrations)

Inability to treat the underlying cause

(Degeneration continues)

Side-effects (gastrointestinal, cardiovascular, renal)

**Treatment
Gap**

Unmet Medical Need



Joint arthroplasty

Last resort for OA patients with end-stage disease

High surgical and rehabilitation costs

Prolonged joint pain and rehabilitation period

Potential need for a second surgery

Death in surgery for elderly and vulnerable patients



Athens

5-7 October 2023



There are multiple and often overlapping phenotypes in populations with OA

OA is a **heterogeneous and low-grade mechano-inflammatory disease** with **multiple etiologies and emerging phenotypes**

There is No One Natural History of Osteoarthritis



Athens

5-7 October 2023

F1000Research

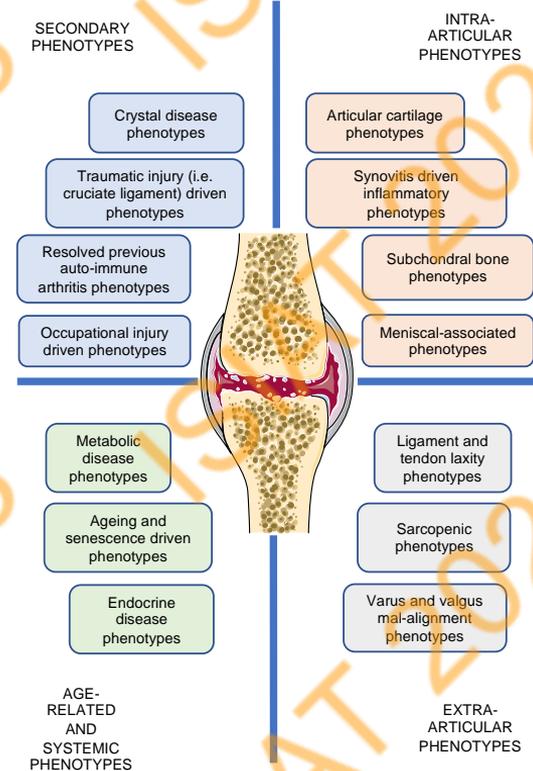
F1000Research 2019, 8(F1000 Faculty Rev):2091 Last updated: 12 DEC 2019



REVIEW

Recent advances in understanding the phenotypes of osteoarthritis [version 1; peer review: 2 approved]

Ali Mobasher^{1,4}, Simo Saarakkala², Mikko Finnilä², Morten A. Karsdal⁴, Anne-Christine Bay-Jensen⁴, Willem Evert van Spil^{5,6}





Athens

5-7 October 2023

Multiple OA Phenotypes and Intra-Articular Injections



Slide courtesy of Professor Alberto Migliore Rome, Italy

The role of metabolism in the pathogenesis of osteoarthritis
 Ali Mobasheri^{1,2}, Margaret P. Rayman³, Oreste Guallini⁴, Jérémie Sellam^{5,6}, Peter van der Kraak⁷ and Ursula Fearon⁸



Athens

5-7 October 2023

Summary of OARSI, ESCEO and ACR Osteoarthritis Treatment Guidelines





Athens

5-7 October 2023

According to the experts...



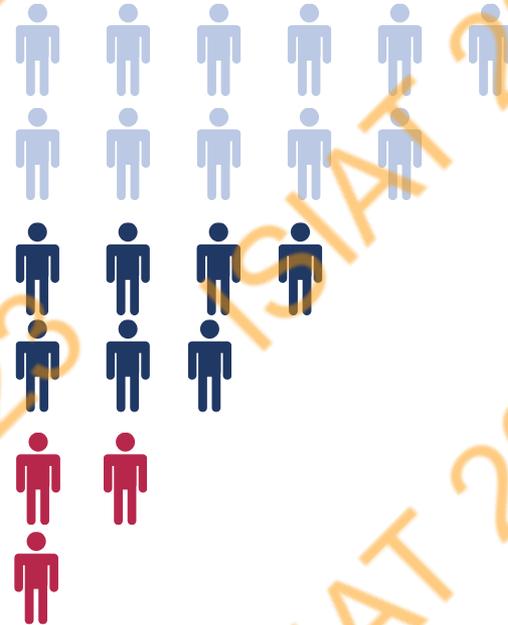
Everyone should receive education to be active, exercise, & manage their weight



Some may benefit from drugs or intra-articular injections

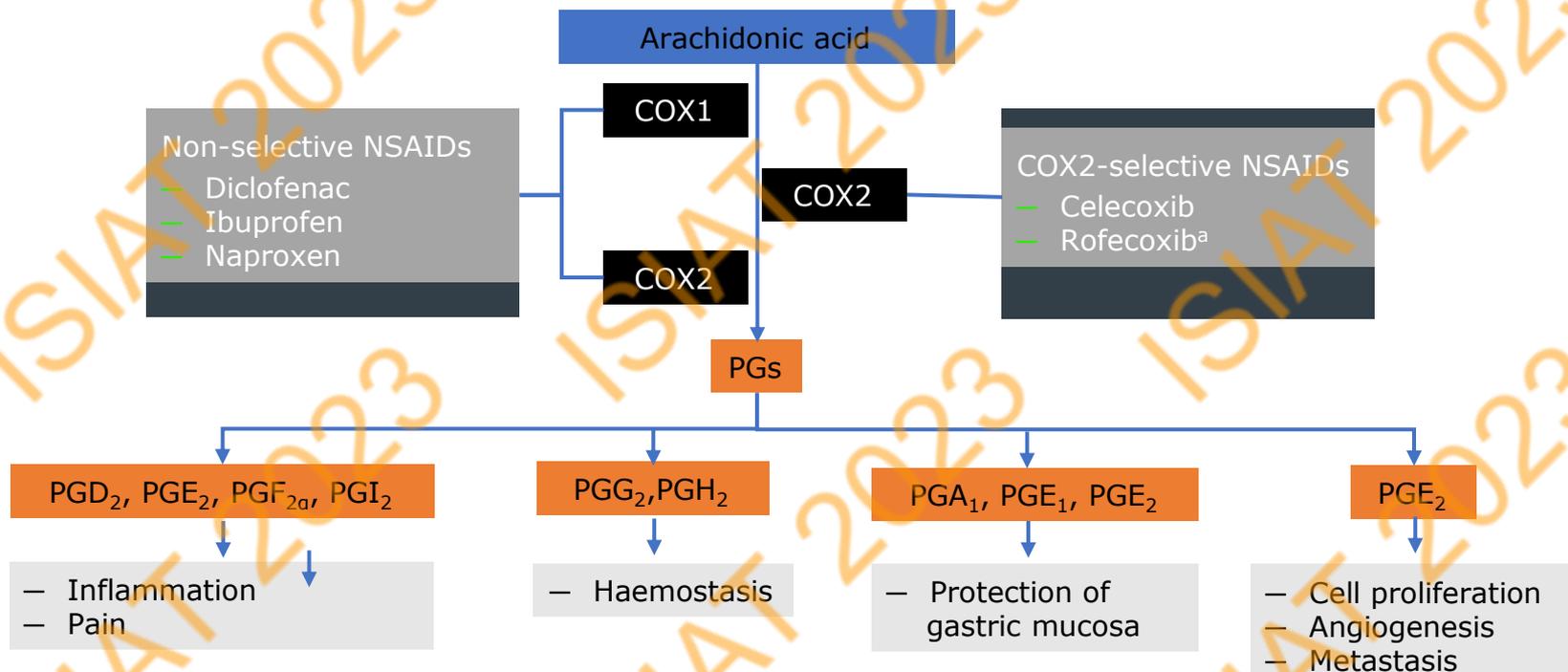


Few need surgery





Arachidonic Acid and Derivatives as Mediators of Pain and Inflammation in OA





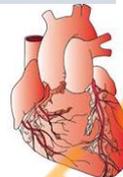
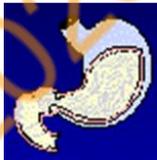
Athens

5-7 October 2023

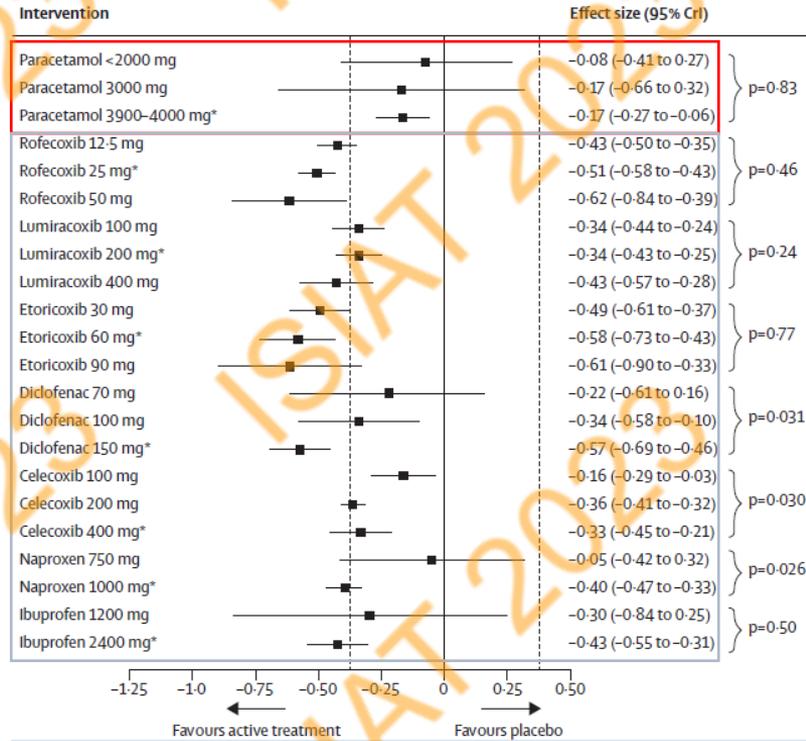
Dilemma of Adverse Effects of Paracetamol and NSAIDs for Treating OA

NSAIDs & Paracetamol

- Limited analgesic effect
- Potential side effects
 - Gastrointestinal
 - Kidney
 - Cardiovascular



Da Costa, Lancet, 2016
Zhang W Ann Rheum Dis. 2007

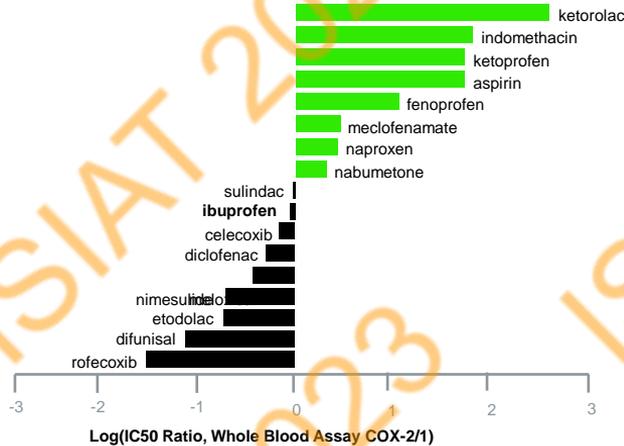




Athens

5-7 October 2023

NSAIDs, COX Selectivity and Risk Profiles

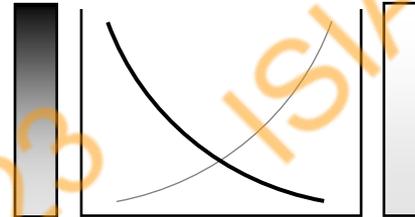


NSAIDs, COX Selectivity, and Risk Profile

Cardiovascular Risk

Stroke
Thrombosis
Myocardial infarction
Congestive heart failure

Discontinuation
Hypertension
Edema



Perforation
Bleeding
GI ulcer

Discontinuation
Vomiting
Nausea
Heartburn
Dyspepsia

- Varrassi, G., Pergolizzi, J.V., Dowling, P. *et al.* Ibuprofen Safety at the Golden Anniversary: Are all NSAIDs the Same? A Narrative Review. *Adv Ther* 37, 61–82 (2020). <https://doi.org/10.1007/s12325-019-01144-9>



Athens

5-7 October 2023

Osteoarthritis and Cartilage 27 (2019) 1578–1589

The 2019 OARSI Treatment Guidelines take several comorbidities into account to offer comprehensive and patient-centered treatment profiles for individuals with knee, hip, and/or polyarticular OA

Osteoarthritis and Cartilage



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



R.R. Bannuru †*, M.C. Osani †, E.E. Vaysbrot †, N.K. Arden ‡§, K. Bennell ||, S.M.A. Bierma-Zeinstra ¶#, V.B. Kraus ††, L.S. Lohmander ‡‡, J.H. Abbott §§, M. Bhandari ||||, F.J. Blanco ¶¶##, R. Espinosa ††† ‡‡‡, I.K. Haugen §§§, J. Lin |||||, L.A. Mandl ¶¶¶, E. Moilanen ###, N. Nakamura †††, L. Snyder-Mackler ‡‡‡, T. Trojian §§§§, M. Underwood ||||| ¶¶¶¶, T.E. McAlindon †



Athens

5-7 October 2023

OARSI 2019 Treatment Algorithm

1. Identify location of OA
2. Diagnose comorbidities
3. Assess clinical status
 - a. Pain, function, stiffness
 - b. Effusion, instability, malalignment
4. Assess emotional and environmental status
 - a. Social network
 - b. Health beliefs and expectations
 - c. Mood
 - d. Sleep quality



Athens

5-7 October 2023

Good Clinical Practice Statements

- Included:
 - **Weight management:** recommended for certain patients (BMI ≥ 30 kg/m²) as part of a healthy lifestyle
 - **NSAID risk mitigation:** advises lowest possible dose of any NSAID for short treatment duration in patients with comorbidities
 - **Intra-articular treatment:** describes the short-term vs. long-term utility and safety of IACS vs. IAHA
 - **Pain management program:** suggests multidisciplinary and holistic options for chronic/widespread pain



Athens

5-7 October 2023

Multimodal and multidisciplinary management regime should accompany IA treatment for knee OA

Drugs

<https://doi.org/10.1007/s40265-022-01773-5>

THErapy IN PRACTICE



Multimodal Multidisciplinary Management of Patients with Moderate to Severe Pain in Knee Osteoarthritis: A Need to Meet Patient Expectations

Nicola Veronese¹ · Cyrus Cooper² · Olivier Bruyère³ · Nasser M. Al-Daghri⁴ · Jaime Branco⁵ · Etienne Cavalier⁶ · Sara Cheleschi⁷ · Mario Coelho da Silva Rosa⁸ · Philip G. Conaghan⁹ · Elaine M. Dennison² · Maarten de Wit¹⁰ · Antonella Fioravanti⁷ · Nicholas R. Fuggle² · Ida K. Haugen¹¹ · Gabriel Herrero-Beaumont¹² · Germain Honvo¹³ · Andrea Laslop¹⁴ · Radmila Matijevic^{15,16} · Alberto Migliore¹⁷ · Ali Mobasheri^{3,18,19,20,21,22,23} · Jean-Pierre Pelletier²⁴ · María Concepción Prieto Yerro²⁵ · Régis Pierre Radermecker²⁶ · François Rannou²⁷ · René Rizzoli²⁸ · Jean-Yves Reginster³

Accepted: 25 August 2022

© The Author(s) 2022



Key Points

Knee osteoarthritis is a common and disabling condition in older people. The guidelines suggest the use of non-pharmacological and pharmacological approaches, but the use of multidisciplinary and multimodal approaches is still underexplored.

The European Society for Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) performed a review of a multimodal/multicomponent approach for knee OA therapy, finding that it is a particularly appropriate solution for the management of patients affected by knee OA, including those with pain and dysfunction reaching various thresholds at the different joints.

In this work, we provided patient-centered perspectives for the management of knee OA, based on the concept that a multimodal, multicomponent, multidisciplinary approach, applied not only to non-pharmacological treatments but also to a combination of the currently available pharmacological options, is probably the best option available.



Athens

5-7 October 2023

Holistic Approaches to Enhance IA Treatment

Self Healing and Augmented Biology

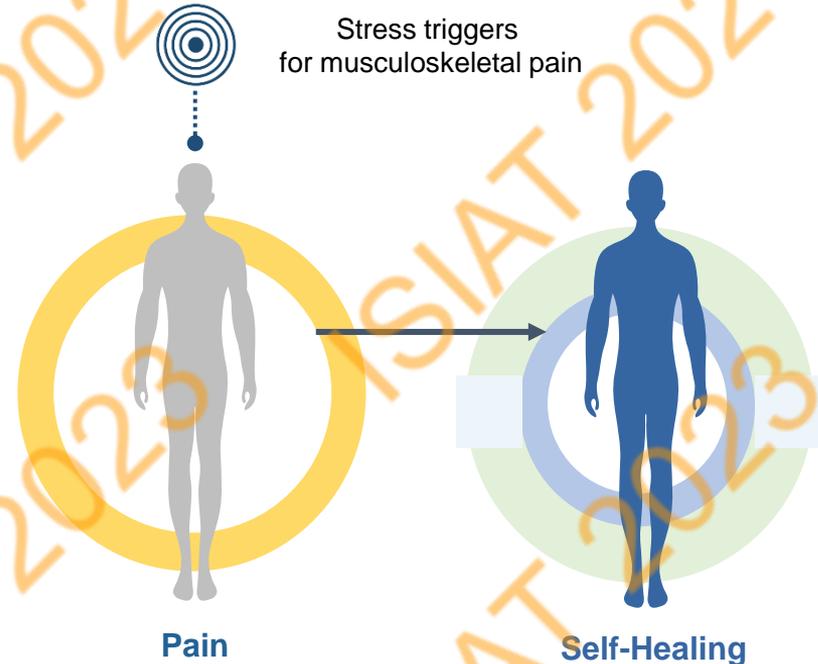


Athens

5-7 October 2023

Physiological Concept of Self-Healing

- When a stress trigger occurs, body **homeostasis is**, or is perceived to be, **threatened**
- **Self-healing** in the context of acute and recurring musculoskeletal pain is the innate ability of the body and mind to **promote mechanisms to return to equilibrium**, in order to help relieve pain induced by various triggers

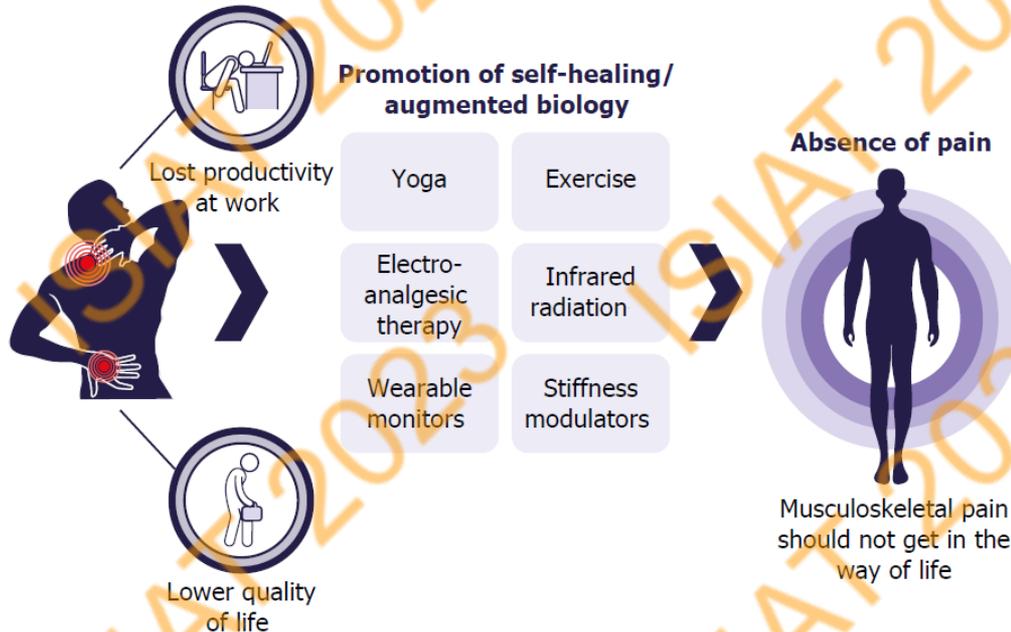




Athens

5-7 October 2023

Integration of the self-healing/augmented biology concept into patient care pathways for musculoskeletal pain



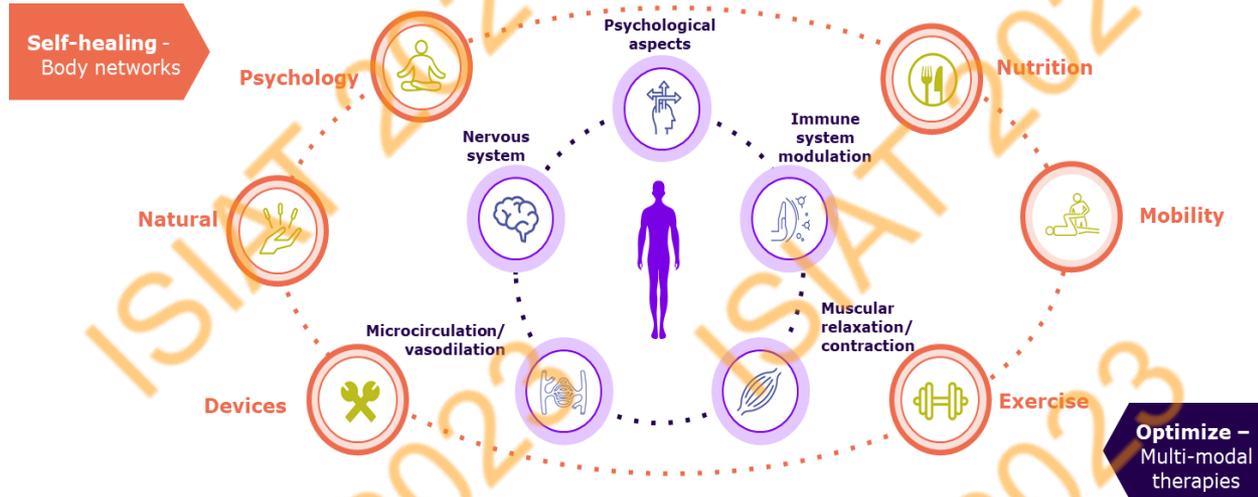


Athens

5-7 October 2023

Self-Healing in the Management of Musculoskeletal Pain

Self-healing in the context of acute and recurring musculoskeletal pain is the innate process of the body and mind, to promote body networks to return to equilibrium and relieve pain





Athens

5-7 October 2023

The Concept of Self-Healing Body Networks

Journal of Pain Research

Dovepress

Open Access Article

COMMENTARY

"Self-Healing": A Novel and Integrated Multimodal Concept for the Management of Musculoskeletal Pain

Ali Mobasheri¹

¹Research Unit of Medical Imaging, Physics and Technology, Faculty of Medicine, University of Oulu, Oulu, FI-90014, Finland; ²Department of Regenerative Medicine, State Research Institute Centre for Innovative Medicine, Vilnius, LT-06616, Lithuania; ³Department of Joint Surgery, The First Affiliated Hospital of Sun Yat-sen University, Guangzhou, 51008, People's Republic of China; ⁴World Health Organization Collaborating Center for Public Health Aspects of Musculo-Skeletal Health and Ageing, Division of Public Health, Epidemiology and Health Economics, University of Liège, Liège, 4000, Belgium

Correspondence: Ali Mobasheri, Research Unit of Medical Imaging, Physics and Technology, Faculty of Medicine, University of Oulu, Oulu, FI-90014, Finland. Email: ali.mobasheri@oulu.fi

Background and Objective: Musculoskeletal (MSK) conditions, particularly low back pain and osteoarthritis, are a leading cause of disability worldwide. The number of people with MSK conditions is set to increase over the coming decades highlighting the need for better tools for both patients and medical practitioners. A recent paper by McSwain, Gafni and co-authors introduces the concept of the innate ability of the body to "self-heal" through five body networks, whilst being optimized by integrative multi-modal medicine and natural remedies ranging from the physical to psychological, that are starting to be incorporated into clinical management and treatment guidelines.

Conclusion: "Self-Healing" is a new concept for MSK pain management and reinforces the potential for integrating multi-modal medicine into current care through open dialogue between patients and healthcare providers.

Keywords: musculoskeletal pain, pain management, low back pain, osteoarthritis, self-healing

Commentary

According to the World Health Organization (WHO) more than 1.7 billion people suffer from musculoskeletal (MSK) conditions¹. MSK conditions are the leading contributors to disability worldwide, with low back pain (LBP) and osteoarthritis (OA) being the leading causes of physical disability globally, with a prevalence of 700 million and 500 million people, respectively.¹⁻³ Ageing, demographic change and the ever increasing global population mean that the number of people with MSK conditions is rapidly increasing and the disability associated with MSK disorders is projected to continue to rise in the next decades. This highlights the need to prioritise MSK disorders and increase the core competency of medical practitioners to develop better tools to help and reassure their patients, with increasing numbers of cases.⁴⁻⁶

MSK conditions are typically characterized by pain, which is frequently chronic and persistent, with limitations in mobility, dexterity and overall level of functioning, reducing quality of life and the ability to work.¹ Traditionally, the treatment of MSK pain and its clinical management has focused on the use of conventional pharmaceuticals to relieve symptoms. However, many of the currently available pain medications have significant side-effects and adverse impacts on the cardiovascular, renal and gastrointestinal systems.⁷⁻⁹ The opioid epidemic has also highlighted the urgent medical need for pain management, highlighting opportunities for developing, testing and implementing multimodal pain management schemes.¹⁰⁻¹²

A recent review paper by McSwain, Gafni and co-authors has introduced the "Self-Healing" concept for MSK pain management.¹³ In this paper, the authors discuss the role of multidisciplinary, multi-modal and integrative approaches in MSK pain management.¹³ They emphasize the increased use of alternative and complementary treatments by patients and the need for integrative approaches in clinical management and treatment guidelines. Aside from highlighting the role of alternative and complementary treatments they propose the novel and plausible concept that the human body has an innate capacity to "self-heal" and that this ability can be optimized by the use of integrative medical

Multi-modal integrative medicine therapies can boost the body's innate ability to self-heal



Received: 16 August 2022
Accepted: 10 October 2022
Published: 6 November 2022

Journal of Pain Research 2022;15:3479-3482
© 2022 Mobasheri, licensee of Dove Medical Publishing Ltd. This article is distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Athens

5-7 October 2023

Self-healing and augmented biology, synergistic concepts for musculoskeletal pain: a literature review

PFR321



M. Pridemore¹, J. Taylor², M. Pridemore³, J. Taylor⁴, M. Pridemore⁵, J. Taylor⁶, M. Pridemore⁷, J. Taylor⁸, M. Pridemore⁹, J. Taylor¹⁰, M. Pridemore¹¹, J. Taylor¹², M. Pridemore¹³, J. Taylor¹⁴, M. Pridemore¹⁵, J. Taylor¹⁶, M. Pridemore¹⁷, J. Taylor¹⁸, M. Pridemore¹⁹, J. Taylor²⁰, M. Pridemore²¹, J. Taylor²², M. Pridemore²³, J. Taylor²⁴, M. Pridemore²⁵, J. Taylor²⁶, M. Pridemore²⁷, J. Taylor²⁸, M. Pridemore²⁹, J. Taylor³⁰, M. Pridemore³¹, J. Taylor³², M. Pridemore³³, J. Taylor³⁴, M. Pridemore³⁵, J. Taylor³⁶, M. Pridemore³⁷, J. Taylor³⁸, M. Pridemore³⁹, J. Taylor⁴⁰, M. Pridemore⁴¹, J. Taylor⁴², M. Pridemore⁴³, J. Taylor⁴⁴, M. Pridemore⁴⁵, J. Taylor⁴⁶, M. Pridemore⁴⁷, J. Taylor⁴⁸, M. Pridemore⁴⁹, J. Taylor⁵⁰, M. Pridemore⁵¹, J. Taylor⁵², M. Pridemore⁵³, J. Taylor⁵⁴, M. Pridemore⁵⁵, J. Taylor⁵⁶, M. Pridemore⁵⁷, J. Taylor⁵⁸, M. Pridemore⁵⁹, J. Taylor⁶⁰, M. Pridemore⁶¹, J. Taylor⁶², M. Pridemore⁶³, J. Taylor⁶⁴, M. Pridemore⁶⁵, J. Taylor⁶⁶, M. Pridemore⁶⁷, J. Taylor⁶⁸, M. Pridemore⁶⁹, J. Taylor⁷⁰, M. Pridemore⁷¹, J. Taylor⁷², M. Pridemore⁷³, J. Taylor⁷⁴, M. Pridemore⁷⁵, J. Taylor⁷⁶, M. Pridemore⁷⁷, J. Taylor⁷⁸, M. Pridemore⁷⁹, J. Taylor⁸⁰, M. Pridemore⁸¹, J. Taylor⁸², M. Pridemore⁸³, J. Taylor⁸⁴, M. Pridemore⁸⁵, J. Taylor⁸⁶, M. Pridemore⁸⁷, J. Taylor⁸⁸, M. Pridemore⁸⁹, J. Taylor⁹⁰, M. Pridemore⁹¹, J. Taylor⁹², M. Pridemore⁹³, J. Taylor⁹⁴, M. Pridemore⁹⁵, J. Taylor⁹⁶, M. Pridemore⁹⁷, J. Taylor⁹⁸, M. Pridemore⁹⁹, J. Taylor¹⁰⁰

Background

- Musculoskeletal pain is an increasing health issue which accounts for 14% of all years lost to disability.
- The self-healing concept is the innate process of the body and aimed to reduce inflammation and relieve pain through the stimulation of the body networks (Fig. 1).

Figure 1. The effects of musculoskeletal pain and the factors involved in the self-healing concept.

Figure 2. The effects of musculoskeletal pain and the factors involved in the self-healing concept.

- As general biology is the application of science/technology to improve human performance. It is synergistic with self-healing, so that the body is enabled to reach its biological potential.
- Not to be confused with devices capable of enhancing human performance beyond biological potential.

Aims

To understand how 'biological potential' is used in the context of augmented biology related to self-healing.

Methods

A literature review was conducted to understand how 'biological potential' is used in the context of augmented biology related to self-healing (Fig. 2).

Figure 2. Methodology flowchart.

Results

- 12 key references were considered to use 'biological potential' in the context of augmented biology related to self-healing.

Figure 3. Evolution to show difference between biological potential, biological optimization, and biological enhancement and the process of performance development.

Figure 4. Summary of techniques/devices for augmented biology.

Conclusions

- Biological potential is used in various ways to self-healing and augmented biology, especially for devices that work with the innate ability of the body to enhance healing.
- Therapies for musculoskeletal pain fit into the self-healing concept.

Relevance for patient care

- Musculoskeletal pain is an increasing health issue, severely impacting both work days and quality of life.
- Augmented biology and self-healing align with patient self-management of musculoskeletal pain via alternative therapies (Fig. 3).

Figure 5. How the self-healing concept can be integrated into patient care for musculoskeletal pain.

Conclusions

- Biological potential is used in various ways to self-healing and augmented biology, especially for devices that work with the innate ability of the body to enhance healing.
- Therapies for musculoskeletal pain fit into the self-healing concept.



VIATRIS



World Arthritis Day 12 October 2023



**Diagnosis and
Management of the
Disease Early On**

**Support
World Arthritis
Day**

#worldarthritisday
www.worldarthritisday.org





VIATRIS invites you to join our

World Arthritis Day Live Expert Session

"STAY AHEAD of Osteoarthritis
Early Diagnosis and Early Intervention"



PROF. ALI MOBASHERI

Professor of Musculoskeletal
Biology, Fibro Obesity Research
Theme, University of Oulu, Finland



DR. NICHOLAS FUGGLE

Associate Professor of Rheumatology at
the MRC Life course Epidemiology Center
at the University of Southampton, UK



12th October, 2023



12:00 PM CET

REGISTER HERE



7th

International Symposium
Intra Articular Treatment



Athens

5-7 October 2023

OA Severity

Window Of Opportunity

*End-Stage OA

Time during disease course

Biochemical markers

MRI finding

Radiographic finding

Preclinical Phase

Early-Stage OA (Symptomatic)

Established OA

- Genetic Predisposition
- Obesity
- Malalignment
- Other Risk Factors
- Accelerated Structural Changes
- Accelerated Clinical Changes
- Structural Changes
- Clinical Changes
- Pattern Of Inertia





Athens

5-7 October 2023

Check for updates

THERAPEUTIC ADVANCES in
Musculoskeletal Disease

Early Osteoarthritis Questionnaire (EOAQ): a tool to assess knee osteoarthritis at initial stage

Alberto Migliore¹, Liudmila Alekseeva, Sachin R. Avasthi, Raveendhara R. Bannuru, Xavier Chevalier, Thierry Conrozier, Sergio Crimaldi, Gustavo C. de Campos, Demirhan Diracoglu, Gianfranco Gigliucci, Gabriel Herrero-Beaumont², Giovanni Iolascon³, Ruxandra Ionescu, Jörg Jerosch, Jorge Lains, Emmanuel Maheu, Souz Makri, Natalia Martusevich, Marco Matucci-Cerinic, Karen Pavelka, Robert J. Petrella, Raghu Raman and Umberto Tarantino

“Adoption of diagnostic criteria of early OA is strongly encouraged and a specific questionnaire for the whole management of the clinical features and patients’ outcome might really improve the evolution of OA in the early stages of the disease, when the treatment is expected to be more effective.”

Original Research

Ther Adv Musculoskelet Dis

2023, Vol. 15: 1–12

DOI: 10.1177/
1759720X221131604

© The Author(s), 2023.
Article reuse guidelines:
sagepub.com/journals-
permissions

Correspondence to:
Alberto Migliore

- A novel EOA questionnaire designed for diagnostic and follow-up assessment
- There are no other questionnaires able to evaluate the EOA at the moment
- A guide to decide when a particular pharmacological or non-pharmacological treatment should be recommended
- This tool would help clinicians to monitor symptoms to prevent the progression of the disease, through non-pharmacological treatments or lifestyle changes



Athens

5-7 October 2023

Thank you for your attention



NetwOArk

The European Network on OsteoArthritis



sanofi

SANOFI 
Consumer Health Care