

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository: <https://orca.cardiff.ac.uk/id/eprint/150536/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Sarzi-Puttini, Piercarlo, Giorgi, Valeria, Atzeni, Fabiola, Gorla, Roberto, Kosek, Eva, Choy, Ernest H. , Bazzichi, Laura, Häuser, Winfred, Ablin, Jacob N., Aloush, Valerie, Buskila, Dan, Amital, Howard, Da Silva, Jose A.P., Perrot, Serge, Morlion, Bart, Polati, Enrico, Schweiger, Vittorio, Coaccioli, Stefano, Varrassi, Giustino, Di Franco, Manuela, Torta, Riccardo, Øien Forseth, Karin Maria, Mannerkorpi, Kaisa, Salaffi, Fausto, Di Carlo, Marco, Cassisi, Gianniantonio and Batticciotto, Alberto 2021. Diagnostic and therapeutic care pathway for fibromyalgia. *Clinical and Experimental Rheumatology* 39 (3) 10.55563/clinexprheumatol/zcp5hz

Publishers page: <http://dx.doi.org/10.55563/clinexprheumatol/zcp5hz>

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



Diagnostic and therapeutic care pathway for fibromyalgia

Authors:

Piercarlo Sarzi-Puttini¹, Valeria Giorgi¹, Fabiola Atzeni², Roberto Gorla³, Eva Kosek⁴, Ernest Choy⁵, Laura Bazzichi⁶, Winfred Hauser⁷, Jacob Ablin⁸, Valerie Aloush⁹, Dan Buskila¹⁰, Howard Amital^{11,12}, Gary J. McFarlane¹³, Jose Antonio Pereira Da Silva^{14,15}, Serge Perrot¹⁶, Bart Morlion¹⁷, Enrico Polati¹⁸, Vittorio Schweiger¹⁹, Stefano Coaccioli²⁰, Giustino Varrassi²¹, Manuela Di Franco²², Riccardo Torta²³, Karin Maria Øien Forseth²⁴, Kaisa Mannerkorpi²⁵, Fausto Salaffi²⁶, Marco Di Carlo²⁶, Gianniantonio Cassisi²⁷, Alberto Batticciotto²⁸.

¹ Rheumatology Unit, Internal Medicine Department, ASST Fatebenefratelli-Sacco, Milan; University School of Medicine, Milan, Italy

² Rheumatology Unit, Department of Internal Medicine, University of Messina, Messina, Italy

³ Unit of Rheumatology and Clinical Immunology, ASST Spedali Civili, Brescia, Italy

⁴ Department of Clinical Neuroscience, Karolinska Institutet and Stockholm Spine Centre, Stockholm, Sweden

⁵ Section of Rheumatology, School of Medicine, Cardiff University, Cardiff, UK.

⁶ Rheumatology Unit, AOU Pisana, Pisa, Italy

⁷ Department Psychosomatic Medicine and Psychotherapy, Technische Universität München, Munich, Germany

⁸ Department of Internal Medicine H, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel.

⁹ Institute of Rheumatology, Tel Aviv Sourasky Medical Centre and the Sackler Faculty of Medicine, Tel Aviv University, Israel.

¹⁰ Department of Medicine, H. Soroka Medical Center, Ben Gurion University of the Negev, Beer Sheva, Israel

¹¹ Department of Medicine B and Center of Autoimmune Diseases, Sheba Medical Center, Tel Hashomer, Israel.

¹² Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.

¹³ Aberdeen Centre for Arthritis and Musculoskeletal Health (Epidemiology Group), School of Medicine Medical Sciences and Nutrition, University of Aberdeen, Aberdeen,

¹⁴ Rheumatology Department, Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal.

¹⁵ Coimbra Institute for Clinical and Biomedical Research (i.CBR), Faculty of Medicine, University of Coimbra, Coimbra, Portugal

- ¹⁶ CETD, CHU Cochin, APHP, Paris-Descartes University, Inserm U987, Paris, France.
- ¹⁷ Leuven Centre for Algology & Pain Management, University Hospitals Leuven, KU Leuven, Leuven, Belgium
- ¹⁸ Department of Surgery, Odontostomatology and Maternal Sciences, Fibromyalgia Diagnosis and Treatment Centre, University of Verona, 37134 Verona, Italy.
- ¹⁹ Department of Internal Medicine, University of Perugia, Terni, Italy.
- ²⁰ Paolo Procacci Foundation, Rome, Italy.
- ²¹ Department of Clinical Internal Medicine, Anesthesiological and Cardiovascular Sciences –Rheumatology Unit, Policlinico Umberto I, La Sapienza University of Rome, Italy
- ²² Clinical Psychology and Psycho-Oncology Unit, Department of Neuroscience, University of Turin, Azienda Ospedaliera Universitaria (A.O.U.) "Città della Salute e della Scienza" Hospital, Turin, Italy.
- ²³ ENFA Board Member, Norway
- ²⁴ Institute of Neuroscience and Physiology, Section of Health and Rehabilitation, Physiotherapy, Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden.
- ²⁵ Rheumatology Clinic, Department of Clinical and Molecular Science, Università Politecnica delle Marche, Jesi, Ancona, Italy
- ²⁶ Rheumatology Branch, Specialist Outpatients Department, Belluno, Italy.
- ²⁷ Rheumatology Unit, Internal Medicine Department, ASST Settelaghi, Ospedale Di Circolo - Fondazione Macchi, Varese, Italy

Email addresses:

Piercarlo Sarzi-Puttini: piercarlo.sarziputtini@gmail.com

Valeria Giorgi: vale.gio@fastwebnet.it

Fabiola Atzeni: atzenifabiola@gmail.com

Roberto Gorla: gorla@bresciareumatologia.it

Eva Kosek: Eva.Kosek@ki.se

Ernest Choy: choyeh@cardiff.ac.uk

Laura Bazzichi: l.bazzichi@gmail.com

Winfred Hauser: whaeuser@klinikum-saarbruecken.de

Jacob Ablin: kobby.ablin@gmail.com

Valerie Aloush: valeriea@tlvmc.gov.il

Dan Buskila: dbuskila@bgu.ac.il

Howard Amital: howard.amital@sheba.health.gov.il

Gary J. Macfarlane: g.j.macfarlane@abdn.ac.uk

Jose Antonio Pereira Da Silva: jdasilva@ci.uc.pt

Serge Perrot: serge.perrot@aphp.fr

Bart Morlion: bart.morlion@uzleuven.be

Enrico Polati: enrico.polati@univr.it

Vittorio Schweiger: vittorio.schweiger@univr.it
Stefano Coaccioli: stefano.coaccioli@gmail.com
Giustino Varrassi: giuvarr@gmail.com
Manuela Di Franco: manuela.difranco@uniroma1.it
Riccardo Torta: riccardo.torta@unito.it
Karin Maria Øien Forseth: forse@online.no
Kaisa Mannerkorpi: kaisa.mannerkorpi@neuro.gu.se
Gianniantonio Cassisi: cassisi.agordo@libero.it
Fausto Salaffi: fausto.salaffi@gmail.com
Marco Di Carlo: dica.marco@yahoo.it
Alberto Batticciotto: battic@tiscali.it

Abstract

Early diagnosis and timely and appropriate treatments positively influence the history of the fibromyalgia syndrome, with favorable repercussions at clinical, psychological, social and economic levels. Notwithstanding, there are still significant problems with timeliness of diagnosis, access to pharmacological therapies - particularly to innovative ones – and appropriate and effective taking in charge of patients. All the aforementioned factors have a great impact on fibromyalgia patients' quality of life. Indeed, even though the World Health Organization recognized fibromyalgia as a chronic condition in the International Classification of Diseases 10th edition (ICD-10), many Countries still fail to recognize the syndrome, and this negatively influences the capability to appropriately protect and care for patients. This is the case in Italy, where just a few Regions have started to put in place precise indications for the people suffering from fibromyalgia syndrome, aiming at the implementation of diagnostic-therapeutic pathways. The Diagnostic-Therapeutic Care Pathway (DTCP) provides an important tool to meet the needs of patients suffering from chronic diseases. They present the organization of an integrated assistance network with a seamless path for disease prevention,

diagnosis and treatment, by means of cooperation among physicians and other healthcare professionals.

Background

DTCP: what is it?

“Active care” represents one of the newest models of healthcare delivery. In particular, the Chronic Care Model [1] is based on an effective and productive interaction between patients, physicians, nurses and other healthcare professionals. Patients are empowered through appropriate training and education programs, activation and inclusion in an enhanced participation community. The Expanded Chronic Care Model extends this vision by directing additional efforts to support people and communities in the prevention of disease and promotion of health. From this perspective, active care aims at both preventing and improving chronic disease management at every stage. Therefore, it involves all levels of the healthcare system, with positive effects expected both for the health of citizens and for the sustainability of the system.

Due to the increasing burden of chronic diseases worldwide[2], there is a growing pressure to use all possible governance tools in order to respond to the needs of patients, promoting accessibility to quality care throughout the territory of countries and geopolitical communities, such as the European Union. The Diagnostic-Therapeutic Care Pathway (DTCP) emerges as an essential tool towards these goals.[3] In fact, DTCPs draw an interdisciplinary care plan designed to respond to the citizen's complex health needs through the promotion of continuity of care, integration between operators, reducing clinical variability, spreading evidence-based medicine and using resources efficiently. In particular, DTCPs effectively respond to the

organizational fragmentation of health services, especially at the hospital-territory interface: they reduce the risks associated with the passage of the patient from the Hospital to territorial and general practice services. This avoids the duplication of health services and contains unjustified health expenditure while offering the patient an organized and simplified care pathway.

Through multi-professional and multidisciplinary collaboration, DTCPs seek to [4]:

- identify care pathway players and their specific roles;
- effectively exchange information among the care pathway players;
- reduce the costs of health care;
- standardize the methodology, the effectiveness of care and follow-up monitoring modalities and indicators;
- give patients the opportunity of treatment at an early stage of the disease;
- reduce procedure activation times and eliminate waiting lists.

DTCP for fibromyalgia syndrome: why

Fibromyalgia syndrome affects about 3% of the population worldwide [5]. The prevalence is estimated to be 2.22% (95% CI 1.36-3.19), in Italy [6], 5.8% in Germany, 4.0% in Spain, 2.2% in France and 3.7% in Portugal [7]. Most patients with fibromyalgia syndrome are between 45 and 64 years of age: i.e., they are in the midst of their active working life, which is greatly impaired by the pain and fatigue of fibromyalgia. About one-third of all fibromyalgia patients are disabled [8], and about one-third of the patients change their occupation to maintain their income. Fibromyalgia syndrome is, to date, one of the main causes of absences from work and of disability. All the aforementioned factors have a great impact on the quality of life of people with fibromyalgia. Thus, the socioeconomic burden and work consequences of fibromyalgia

syndrome are far greater than the costs incurred to treat it [9, 10]. Early diagnosis and timely and appropriate treatments positively influence the history of the syndrome, with favorable repercussions at clinical, psychological, social and economic levels[11, 12]. Notwithstanding, there are still significant problems with timeliness of diagnosis, access to therapies - particularly to innovative ones – and coordinating appropriate care of these patients[12]. These observations highlight the need for a DTCP for fibromyalgia, aiming at the promotion of shared care pathways that are able to:

- guarantee early diagnosis;
- carry out multidimensional assessments of health needs;
- integrate the multiplicity of interventions, and ensure that patient care is not jeopardized by fragmentation of the path;
- guarantee service appropriateness;
- improve quality of care;
- correctly manage the condition and reduce its complications;
- guarantee fair access to treatments on an (inter)national basis;
- reinforcing the sustainability of National Health Systems.

At the core of the concept is the need to define, organize and streamline the most appropriate sequence of events and actions to ensure that the patients' health concerns are effectively addressed. The communication between physician and patient is of utmost importance in this process. Indeed, even if the path is defined by the National Health System, the doctor cannot set up a therapeutic procedure without taking into account the patient's habits and needs, and the patient cannot ignore the limits of the health intervention and the need to comply with agreed procedures. Moreover, multi-professional and multidisciplinary interventions become often necessary, addressing different physical, psychical and social issues.

To conclude, DTCP is a tool of *Clinical Governance* which, by means of stepwise processes,

- 1) defines objectives, roles and areas of intervention;
- 2) guarantees clarity of information to the patient and clarity of tasks to the operators;
- 3) helps improve quality, consistency, reproducibility and uniformity of services provided;
- 4) helps predicting and reducing risks and complications;
- 5) facilitates flexibility by integrating activities and interventions in a context in which different specialties, professions and areas of action are involved.

DTCP for fibromyalgia syndrome: how

It is widely accepted that management of people with fibromyalgia, and in general of the chronic disease patient, needs an integrated approach [13]. It comprises the general practitioner (GP), the reference specialists (rheumatologists/algologists) as well as other health care professionals who come into play at different moments of the care pathway. The effective organization of the system requires three essential components:

- 1) a DTCP that defines specific roles and tasks for each carer;
- 2) effective communication among the various carers (GPs / specialists / health care professionals);
- 3) a patient who is motivated, informed and educated about his/her illness management.

The first point will be the subject of this paper. For points 2 and 3, local initiatives are hoped for (see *Box 1*). They could be framed by local healthcare agencies involved in the implementation of the DTCP document.

Communication among DTCP actors

Fibromyalgia syndrome requires a complex treatment that must be continuously monitored and adapted over time. The aim is both to better control the illness and to monitor treatment, in order to prevent side effects. This requires a constant collaboration and communication between the specialist and the GP, which can be served by summaries, written by both of them, of the diagnosis, the prescribed therapy, its tolerability and patient's compliance, and the follow-up tests performed. The specialist has the role of defining the diagnosis, establishing the therapeutic program and assessing its effectiveness over time. Cooperation is expected from the General Practitioner in the continue support of the patient and family, and regular assessment of the efficacy and tolerability of the therapy through periodic assessments and scheduled treatment changes.

Box 1

DTCP Actors

1) General Practitioner (GP)

The GP is the mainstay of Primary Care. He or she is usually the first contact person of the patient with the healthcare system and establishes a continuous relationship with the patients, proving easy access to consultations. The GP is responsible for the identification of any risk factors, signs and symptoms related to fibromyalgia syndrome and for deciding whether in-depth diagnostic investigations or referral to second and third level specialists are warranted. The GP can, therefore, have a decisive contribution to avoid diagnostic delays, disease complications, improper use of resources and inadequate prescription of therapy. Furthermore, the GP also has an essential role in empowering patients and family members, by providing information on the disease, its evolution and on the effectiveness and tolerability of available treatments. Furthermore, the GP plans and activates home assistance for patients who need it, in collaboration with other health professionals (nurse, physiotherapist, social assistant,

psychologist, etc). All these tasks can and should be accomplished in close collaboration with the physicians and departments providing secondary or tertiary support.

2) Specialized physician of the Secondary and Tertiary care

Herein, by “specialized physician” we mean the rheumatologist or algologist. The choice of either the two depends on patient’s preferences and the local context. Their role is to make a diagnosis in case of doubts or laboratory exams alterations, to establish a therapeutic program and assess its effectiveness over time, to perform follow-up visits and to prescribe second-level investigations when needed. The main roles of the specialist are summarized in *Table 1*.

GP	SPECIALIST (RHEUMATOLOGIST/ALGOLOGIST)
Prescription of first-level exams	Comprehensive evaluation
Diagnosis of fibromyalgia syndrome	Diagnosis of fibromyalgia syndrome, differential diagnosis
Possible referral to specialist	Second-level investigations
First therapeutic indications and patient and family education	Definition of a therapeutic program
Assessment of efficacy and tolerability of the therapy over time	Regular follow-up visits and assessment of therapeutic effectiveness
Access to DTCP	DTCP continuation
Communication with the specialist	Communication with the GP

Table 1 The main roles of the specialized physician in the context of the DTCP, in relation with the general practitioner

DTCP: diagnostic-therapeutic care pathway; GP: general practitioner.

3) Allied Health Professionals (nurse, psychologist, physiatrist, physiotherapist etc.)

They will support the patient in any other aspect of his or her disease. They have a major role for the psychologic, rehabilitation and occupational issues of fibromyalgia patients (see below: DTCP phases – 2nd phase). The need of a consultation with one of these Health professionals is evaluated by the GP and/or by the Specialized Secondary or Tertiary Care physician, who draw the individualized therapeutic program.

Table 2 shows a summary of the role of the other Health professionals involved in the DTCP for fibromyalgia.

GP	OTHER SPECIALISTS
Comorbidity management and referral of difficult-to-manage comorbidities	Therapeutic indications (pharmacologic treatment, physical therapies, rehabilitative interventions, psychological interventions, etc.)
Clinical surveillance, therapy side effect surveillance	Periodical follow-ups
Patient education	Patient education
Communication with the Health Professional	Communication with GP

Table 2 The role of other Health Professionals in the management of fibromyalgia (e.g., physiotherapist, nurse, psychologist)

DTCP phases

1st phase: diagnosis

Although diagnostic criteria for fibromyalgia have been refined over the last ten years, the diagnosis of fibromyalgia syndrome continues to raise challenges to physicians. The latest American College of Rheumatology (ACR) criteria (2010/2011 and 2016 revision) abandoned the assessment of tender points, which was at the basis of the 1990 ACR criteria [14–17]. They defined fibromyalgia as a multi-symptom disorder, considering fundamental the presence of the ancillary symptoms of chronic widespread pain, sleep disturbances, fatigue, and cognitive

dysfunction. Subsequently, the ACTION-APS Pain Taxonomy diagnostic criteria published in 2018 [18] highlighted the concept of generalized pain and created the “core” criteria for fibromyalgia, which are generalized pain, chronic fatigue and sleep disturbances. The diagnosis of fibromyalgia syndrome remains essentially clinical as a diagnostic biomarker is not currently available. A complete medical (including drug) history and complete physical examination is mandatory in the evaluation of a patient with chronic widespread pain in order to consolidate the diagnosis of fibromyalgia syndrome or identify features that may suggest other conditions with similar clinical presentation (*Table 3*). Since many other diseases are similar, experience is of undoubtable value for a correct diagnosis. The GP can either diagnose fibromyalgia syndrome, or promptly refer the patient to the specialist, so that multimodal therapies can be started as soon as possible, in order to try to change the evolution of the disease. *Table 4* shows the criteria which can be considered by the GP for the purpose of referral to the specialist.

Main fibromyalgia differential diagnoses
Statin-induced myalgias
Hypothyroidism
Inflammatory/rheumatic conditions
Various types of neuropathies
Sleep apnea syndrome
Anxiety/depression/somatoform diseases
Viral illnesses

Table 3 Main fibromyalgia differential diagnoses. Adapted from Häuser W, et al. *Clin Exp Rheumatol*. 2019;37:90–97[12].

Criteria to be considered for referral to the specialist
Fever
Photosensitivity, rash, aphthae, alopecia, Raynaud’s phenomenon, xerophthalmia, purpura
Joint swelling, redness, heat

Lab test abnormalities
Neurologic signs and symptoms
Pain refractory to common analgesics

Table 4 Criteria for referral to rheumatologist/algologist for the purpose of differential diagnosis (“Red flags”). Adapted from: Arnold LM et al., *Mayo Clin Proc* 2011 86:457-464[19]

Laboratory and imaging tests must be tailored to the individual case in order to confirm or deny the suspected diagnosis. These tests are listed in *Table 5*, divided as first and second level exams.

I level	II level
Complete blood count	ANA, ENA
C-reactive protein, Erythrocyte Sedimentation Rate, Protein electrophoresis	Rheumatoid Factor
AST, ALT, Creatinine	Anti-CCP
CPK	Electromyography
TSH, fT4, fT3	Joint Ultrasound
Vitamin D	Magnetic Resonance Imaging
Iron, Electrolytes	

Table 5. I and II level tests in the diagnostic workup for fibromyalgia syndrome Adapted from Häuser W, et al. *Clin Exp Rheumatol.* 2019;37:90–97[12].

2nd phase: the integrative GP/Specialist/Nurse relationship for fibromyalgia treatment

- The GP

The GP can refer the patient to a specialist mainly when diagnosis is in doubt, if there are concomitant lab test abnormalities or inadequate response to patient education and basic

treatment. Once the diagnosis is confirmed, the GP can start patient education in order to stimulate the patient to change his/her lifestyle and to take an active role in managing the disease. He or she also takes part in the drawing of the therapeutic program, communicating with the Secondary/Tertiary care physician, and considers referring the patient to other Health professionals when needed.

- The Secondary/Tertiary care physician (rheumatologist/algologist)

After completion of a full diagnostic workup for fibromyalgia diagnosis, the specialist will draw the therapeutic program for fibromyalgia patients, will continue managing the most complex and severe cases and the patients with relevant comorbidities with more frequent follow-up visits, and will refer for other specialistic care if necessary, in cooperation with the GP. It is the obligation of rheumatologists and algologists to ensure that they maintain state-of-the-art knowledge and competency in the investigation and management of fibromyalgia syndrome.

- Nursing care

The correct organization of adequately customized care paths is essential to reach the highest care quality. The "case manager" nurse is the best positioned professional to guarantee the organization and management of these paths. An adequately trained nurse can carry out numerous activities - such as clinimetric evaluation, counseling and patient education. Of no less importance is the organization of the care path, i.e., managing of appointments, helping in achieving compliance with drug administration, updating of clinical documentation and planning of hospitalization and related workloads. In addition, the nurse can organize, in collaboration with the specialist, the activities that may become necessary if adverse events appear during treatment with different drugs.

- Therapeutic strategy

Treatment should consistently pursue the following goals are: (i) minimize pain, (ii) improve sleep, (iii) treat mood disorders, (iv) mitigate fatigue [20]. For fibromyalgia syndrome a multimodal approach is mandatory, in which different pharmacological and non-pharmacological interventions, addressing different symptoms, are combined, following EULAR 2016 recommendations [21] (*Figure 1*).

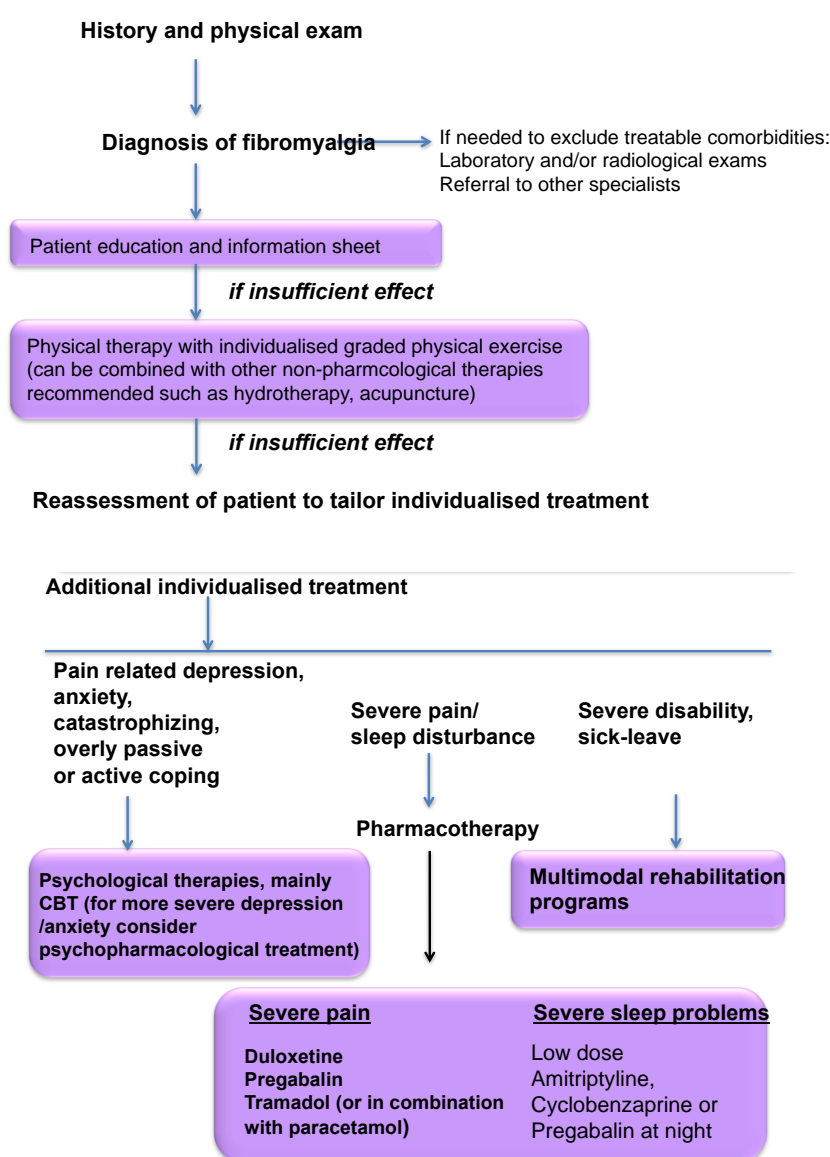


Figure 1 Management of fibromyalgia following the latest EULAR recommendations.

a) Pharmacologic treatment

A comprehensive review of pharmacologic treatment is beyond the scope of this article. Herein, we provide a short summary of the drugs which are mostly used for fibromyalgia syndrome, keeping in mind that at present, in Europe, there are currently no drugs approved by the European Medicines Agency (EMA) for fibromyalgia syndrome.

The drugs that have proved most effective in treating fibromyalgia are centrally acting medications, particularly antidepressants and anticonvulsants [22]. They exert their action by increasing the presence of pain-inhibitory neurotransmitters or decreasing systemic hyperexcitability. Opioids are burdened by severe side effects and are not effective for fibromyalgia pain, therefore their use should be avoided [23]. Tramadol is the only analgesic drug that may be effective in reducing fibromyalgia pain [21], and this is due to a combination opioid agonist action with inhibition of noradrenaline and serotonin reuptake. Antidepressants [24] include mainly duloxetine and milnacipran, both Food and Drug Administration (FDA)-approved for FM, since they had good results in terms of efficacy and tolerability in patients with fibromyalgia. Nonetheless, side effects may lead to withdrawal of medication. Among the anticonvulsants [25], recent meta-analyses underlined that pregabalin is, in fact, effective and safe for fibromyalgia [26–28], and it is so far the only FDA-approved anticonvulsant for fibromyalgia. Myorelaxants, such as cyclobenzaprine, can also be considered for fibromyalgia treatment [29], and cannabis has also been recently proposed as an interesting phytotherapeutic compound [30–32].

Despite the better understanding of the pathogenetic mechanisms underlying this disease, and the increasing availability of molecules with central analgesic action, results obtained with pharmacological treatment alone are often unsatisfactory, and drug treatment should be part of a multidisciplinary therapeutic approach, which also includes non-pharmacological strategies [33].

b) Non-pharmacologic treatment

The first step consists in educating the patient and the family, reassuring them that fibromyalgia is a “real” disease in order to legitimate patient’s suffering. It should be also stated that fibromyalgia, although an invalidating condition, is not progressive, and that the patient him/herself has a predominant role in disease management, introducing the concept of “self-management” [34, 35]. The role of stress, mood disturbances and sleep disorders have to be recognized, and the patient should be elicited to learn relaxation techniques and start good sleep hygiene. Fibromyalgia patients should be also initiating a low-impact, gradual aerobic exercise, adapting it to individual physical resources and needs: physical activity must be regular, combined with periods of rest and recovery [21]. Stretching is a valuable exercise to recover muscle elasticity. Exercise in thermal water has also been shown to be effective in some clinical studies. Movement meditation [36] (tai-chi, yoga, qigong) can be also very effective.

In association with exercise, cognitive behavioral therapy, meditation and mindfulness, that integrate mind and body, are important [37, 38]. As regards physical therapies (thermotherapy, massotherapy and cryotherapy), at present their use is based more on the opinion of expert panels than on irrefutable scientific evidence.

It is important to maintain an appropriate dietary and nutritional regime and correct any deficiencies (vitamin D, magnesium, phosphorus and calcium) to reduce the risk of comorbidities such as cardiovascular disease and osteoporosis. Other supportive therapies can also be used - such as acupuncture [39].

c) Rehabilitation

Rehabilitation is an important element in the management of fibromyalgia [40]. It is important to initiate it at an early stage, when, together with pharmacologic treatment, the aim is the prevention of pain aggravation and related limitations of daily activities and social engagement.

Since the primary objective of rehabilitation is the functional protection of the person within a health strategy, as defined by the World Health Organization, it is essential to carry out a health status evaluation and management [41]. Therefore, a patient-tailored rehabilitation project must take into account his or her needs, preferences, current and potential impairments, residual and recoverable abilities, available resources, and, finally, environmental and social influences. A rehabilitation program should be activated as soon as possible, fitting it to the stage of the disease and integrating it with other professional figures.

The dynamic interaction between physicians and other health care professionals, with the patient and his family members, places the person with his or her needs and expectations at the center of the rehabilitation process.

d) Psychological/Psychiatric assistance

Fibromyalgia is frequently comorbid with psychiatric disorders. These may be highly disturbing by themselves [42], but they also interfere with the severity and treatment of fibromyalgia, for example by aggravating the affective component of pain or amplifying the functional deficits [43]. Psychiatric referral is suggested when a comorbid psychiatric disorder does not respond to prescribed fibromyalgia drugs or shows severe and/or complex clinical manifestations, for example self-injury, psychotic symptoms or severe personality disorders. The psychiatrist and/or psychologist identifies and carries out the most appropriate psychological or chemical interventions in relation to the patient's cognitive characteristics, deficits, psychological and environmental resources.

e) Social and work reintegration and facilitations

Fibromyalgia syndrome is one of the main causes of disability and loss of working capability [44]. Both have a significant negative impact on the quality of life and financial status of the

person, together with adverse effects on workplace [45]. It is therefore important to implement an organized care network for work re-integration and job rehabilitation for fibromyalgia patients, with the creation of working places and social frames that are able to accommodate the patients abilities and needs to optimize the outcomes in terms of health, personal satisfaction and productivity [45].

3rd phase: Feedback and Follow-up

There is a wide variety of tools for the evaluation of people with fibromyalgia but the best choices for the individual patient are not always clear. [46] One of the main problems is the multifactorial nature of the syndrome which makes it necessary to evaluate primary and secondary outcomes in an integrated frame - i.e. one should consider not only pain as the primary outcome but also other symptoms such as sleep, fatigue or asthenia, and, not least, socio-relational signs. This assessment can be carried out using disease-specific clinimetric tests and scales [47], such as the Fibromyalgia Impact Questionnaire[48] and its revised version [49, 50] and the Fibromyalgia Assessment Status[51, 52], with its modified [53]. More specific tools may be considered to address individually relevant issues.

4th phase: Evaluation of DTCP

A set of indicators for the monitoring of DTCPs (health care quality indicators) should be defined *a priori* on the basis of validity, reproducibility and feasibility criteria. They are registered in a database with the help of appropriate codes, identifying prevalent cases, new cases, drug prescriptions (new/old), check-ups and diagnostic tests (see *Table 6*). Some processes are not currently measurable, raising the need for an upgrade of the current Information Technology (IT) system.

Process	Quality Indicator
Access to the DTCP	<p>If there is a diagnostic suspicion, diagnosis should be done within 3 months.</p> <p><i>NUMERATOR: number of patients that are referred to the specialist in 3 months</i></p> <p><i>DENOMINATOR: number of patients that are referred to the specialist for the first time and receive a diagnosis of fibromyalgia</i></p>
Fibromyalgia definition/severity assessment	<p>If the patient has a diagnosis of fibromyalgia, he or she has to have tested (at least) TSH, ANA, CRP, ESR and complete blood count within 3 months after the diagnosis.</p>
Pharmacologic and nonpharmacologic treatment	<p>If a patient has a new diagnosis of fibromyalgia, he or she should have prescriptions of: analgesics, antidepressants and/or anticonvulsants and/or cognitive-behavioral therapy and/or functional rehabilitation, with consequent assessment of work capability and disease activity.</p>

Table 6 Measurable DTCP quality indicators

References

- [1] BARR VJ ET AL.: The expanded Chronic Care Model: an integration of concepts and strategies from population health promotion and the Chronic Care Model. *Hosp Q* 2003; 7: 73–82.
- [2] HARDY GE: The burden of chronic disease: The future is prevention: Introduction to Dr. James Marks' presentation, 'the burden of chronic disease and the future of public health'. *Prev Chronic Dis*; 1, <http://www.cdc.gov/> (2004, accessed 11 January 2021).
- [3] CAMPBELL H, HOTCHKISS R, BRADSHAW N, PORTEOUS M: Integrated Care Pathways. In: *The British Medical Journal*. Royal Society of Medicine Press Ltd, 1998, pp. 133–137.
- [4] RUSSO R: Profili di cura e profili assistenziali: obiettivi e metodologia. *Polit Sanit* 2000; 1: 182–195.
- [5] QUEIROZ LP: Worldwide epidemiology of fibromyalgia. *Curr Pain Headache Rep* 2013; 17: 356.
- [6] SALAFFI F ET AL.: Prevalence of musculoskeletal conditions in an Italian population sample: Results of a regional community-based study. I. The MAPPING study. *Clin Exp Rheumatol* 2005; 23: 819–828.
- [7] BRANCO JC ET AL.: Prevalence of Fibromyalgia: A Survey in Five European Countries. *Semin Arthritis Rheum* 2009; 39: 448–453.
- [8] FITZCHARLES M-A, STE-MARIE PA, RAMPAKAKIS E, SAMPALIS JS, SHIR Y: Disability in Fibromyalgia Associates with Symptom Severity and Occupation Characteristics. *J Rheumatol* 2016; 43: 931–6.
- [9] LACHAINE J, BEAUCHEMIN C, LANDRY P-A: Clinical and economic characteristics of patients with fibromyalgia syndrome. *Clin J Pain* 2010; 26: 284–90.
- [10] LACASSE A, BOURGAULT P, CHOINIÈRE M: Fibromyalgia-related costs and loss of

- productivity: a substantial societal burden. *BMC Musculoskelet Disord* 2016; 17: 168.
- [11] CHOY E ET AL.: A patient survey of the impact of fibromyalgia and the journey to diagnosis. *BMC Health Serv Res* 2010; 10: 102.
- [12] HÄUSER W, SARZI-PUTTINI P, FITZCHARLES MA: Fibromyalgia syndrome: under-, over- and misdiagnosis. *Clin Exp Rheumatol* 2019; 37: 90–97.
- [13] SARZI-PUTTINI P, ATZENI F, SALAFFI F, CAZZOLA M, BENUCCI M, MEASE PJ: Multidisciplinary approach to fibromyalgia: What is the teaching? *Best Practice and Research: Clinical Rheumatology* 2011; 25: 311–319.
- [14] WOLFE F ET AL.: The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. *Arthritis Rheum* 1990; 33: 160–72.
- [15] WOLFE F ET AL.: The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. *Arthritis Care Res* 2010; 62: 600–610.
- [16] WOLFE F ET AL.: Fibromyalgia criteria and severity scales for clinical and epidemiological studies: A modification of the ACR preliminary diagnostic criteria for fibromyalgia. *J Rheumatol* 2011; 38: 1113–1122.
- [17] WOLFE F ET AL.: 2016 Revisions to the 2010/2011 fibromyalgia diagnostic criteria. *Semin Arthritis Rheum* 2016; 46: 319–329.
- [18] ARNOLD LM ET AL.: AAPT Diagnostic Criteria for Fibromyalgia. *J Pain* 2018; 00: 1–18.
- [19] ARNOLD LM, CLAUW DJ, MCCARBERG BH: Improving the recognition and diagnosis of fibromyalgia. *Mayo Clin Proc* 2011; 86: 457–464.
- [20] SARZI-PUTTINI P, GIORGI V, MAROTTO D, ATZENI F: Fibromyalgia: an update on clinical characteristics, aetiopathogenesis and treatment. *Nat Rev Rheumatol* 2020; 16: 645–660.

- [21] MACFARLANE GJ ET AL.: EULAR revised recommendations for the management of fibromyalgia. *Ann Rheum Dis* 2017; 76: 318–328.
- [22] CLAUW DJ: Fibromyalgia: A clinical review. *JAMA - J Am Med Assoc* 2014; 311: 1547–1555.
- [23] LITTLEJOHN GO, GUYMER EK, NGIAN G-S: Is there a role for opioids in the treatment of fibromyalgia? *Pain Manag* 2016; 6: 347–55.
- [24] HÄUSER W, WOLFE F, TÖLLE T, UÇEYLER N, SOMMER C: The role of antidepressants in the management of fibromyalgia syndrome: a systematic review and meta-analysis. *CNS Drugs* 2012; 26: 297–307.
- [25] ÜÇEYLER N, SOMMER C, WALITT B, HÄUSER W: Anticonvulsants for fibromyalgia. *Cochrane Database Syst Rev* 2013; CD010782.
- [26] STRAUBE S, DERRY S, MOORE RA, MCQUAY HJ: Pregabalin in fibromyalgia: meta-analysis of efficacy and safety from company clinical trial reports. *Rheumatology (Oxford)* 2010; 49: 706–15.
- [27] DERRY S, CORDING M, WIFFEN PJ, LAW S, PHILLIPS T, MOORE RA: Pregabalin for pain in fibromyalgia in adults. *Cochrane Database of Systematic Reviews*; 2016. Epub ahead of print 29 September 2016. DOI: 10.1002/14651858.CD011790.pub2.
- [28] ALCIATI A ET AL.: Controlled-release pregabalin in the treatment of fibromyalgia. *Expert Rev Neurother* 2018; 18: 617–623.
- [29] TOFFERI JK, JACKSON JL, O'MALLEY PG: Treatment of fibromyalgia with cyclobenzaprine: A meta-analysis. *Arthritis Rheum* 2004; 51: 9–13.
- [30] YASSIN M, ORON A, ROBINSON D: Effect of adding medical cannabis to analgesic treatment in patients with low back pain related to fibromyalgia: an observational cross-over single centre study. *Clin Exp Rheumatol* 2019; 37 Suppl11: 13–20.
- [31] GIORGI V, BONGIOVANNI S, ATZENI F, MAROTTO D, SALAFFI F, SARZI-PUTTINI P: Adding medical cannabis to standard analgesic treatment for fibromyalgia: a

- prospective observational study. *Clin Exp Rheumatol* 2020; 38: 53–59.
- [32] CHAVES C, BITTENCOURT PCT, PELEGRINI A: Ingestion of a THC-Rich Cannabis Oil in People with Fibromyalgia: A Randomized, Double-Blind, Placebo-Controlled Clinical Trial. *Pain Med* 2020; 21: 2212–2218.
- [33] PERROT S, RUSSELL IJ: More ubiquitous effects from non-pharmacologic than from pharmacologic treatments for fibromyalgia syndrome: a meta-analysis examining six core symptoms. *Eur J Pain* 2014; 18: 1067–80.
- [34] PEARSON J, WHALE K, WALSH NE, DERHAM S, RUSSELL J, CRAMP F: Fibromyalgia Self-Management: Mapping the behaviour change techniques used in a practice-based programme. *Musculoskeletal Care* 2020; msc.1470.
- [35] CLAUW DJ, ESSEX MN, PITMAN V, JONES KD: Reframing chronic pain as a disease, not a symptom: rationale and implications for pain management. *Postgrad Med* 2019; 131: 185–198.
- [36] AMAN MM, JASON YONG R, KAYE AD, URMAN RD: Evidence-Based Non-Pharmacological Therapies for Fibromyalgia. *Curr Pain Headache Rep* 2018; 22: 1–5.
- [37] BERNARDY K, KLOSE P, BUSCH AJ, CHOY EHS, HÄUSER W: Cognitive behavioural therapies for fibromyalgia. *Cochrane Database of Systematic Reviews*; 2017. Epub ahead of print 10 September 2013. DOI: 10.1002/14651858.CD009796.pub2.
- [38] MIST SD, FIRESTONE KA, JONES KD: Complementary and alternative exercise for fibromyalgia: A meta-analysis. *J Pain Res* 2013; 6: 247–260.
- [39] DEARE JC ET AL.: Acupuncture for treating fibromyalgia. *Cochrane database Syst Rev* 2013; CD007070.
- [40] ADAMS N, SIM J: Rehabilitation approaches in fibromyalgia. *Disability and Rehabilitation* 2005; 27: 711–723.
- [41] THE WORLD HEALTH ORGANIZATION (WHO): *Rehabilitation 2030: A Call for Action*. 2017. Epub ahead of print 2017. DOI: 10.1097/RNJ.0000000000000226.

- [42] GONZÁLEZ E, ELORZA J, FAILDE I: Fibromyalgia and psychiatric comorbidity: their effect on the quality of life patients. *Actas Esp Psiquiatr* 2010; 38: 295–300.
- [43] EDWARDS RR, CALAHAN C, MENSING G, SMITH M, HAYTHORNTHWAITA JA: Pain, catastrophizing, and depression in the rheumatic diseases. *Nature Reviews Rheumatology* 2011; 7: 216–224.
- [44] HENRIKSSON CM, LIEBERG GM, GERDLE B: Women with fibromyalgia: Work and rehabilitation. *Disability and Rehabilitation* 2005; 27: 685–694.
- [45] BEN-YOSEF M, TANAI G, BUSKILA D, AMITAL D, AMITAL H: Fibromyalgia and Its Consequent Disability. *Isr Med Assoc J IMAJ* 2020; 22: 446–450.
- [46] SALAFFI F, SARZI-PUTTINI P, CIAPETTI A, ATZENI F: Assessment instruments for patients with fibromyalgia: Properties, applications and interpretation. *Clinical and Experimental Rheumatology* 2009; 27: S92-105.
- [47] SALAFFI F ET AL.: The Italian Fibromyalgia Registry: a new way of using routine real-world data concerning patient-reported disease status in healthcare research and clinical practice. *Clin Exp Rheumatol* 2020; 38: 65–71.
- [48] BURCKHARDT CS, CLARK SR, BENNETT RM: The fibromyalgia impact questionnaire: development and validation. *J Rheumatol* 1991; 18: 728–33.
- [49] BENNETT RM, FRIEND R, JONES KD, WARD R, HAN BK, ROSS RL: The Revised Fibromyalgia Impact Questionnaire (FIQR): validation and psychometric properties. *Arthritis Res Ther* 2009; 11: R120.
- [50] SALAFFI F, FRANCHIGNONI F, GIORDANO A, CIAPETTI A, SARZI-PUTTINI P, OTTONELLO M: Psychometric characteristics of the Italian version of the revised Fibromyalgia Impact Questionnaire using classical test theory and Rasch analysis. *Clin Exp Rheumatol* 2013; 31: S41-9.
- [51] SALAFFI F, SARZI-PUTTINI P, GIROLIMETTI R, GASPARINI S, ATZENI F, GRASSI W: Development and validation of the self-administered Fibromyalgia Assessment Status:

- a disease-specific composite measure for evaluating treatment effect. *Arthritis Res Ther* 2009; 11: R125.
- [52] IANNUCELLI C ET AL.: Psychometric properties of the Fibromyalgia Assessment Status (FAS) index: a national web-based study of fibromyalgia. *Clin Exp Rheumatol* 2011; 29: S49-54.
- [53] SALAFFI F ET AL.: Diagnosis of fibromyalgia: comparison of the 2011/2016 ACR and AAPT criteria and validation of the modified Fibromyalgia Assessment Status. *Rheumatology (Oxford)*. Epub ahead of print 24 March 2020. DOI: 10.1093/rheumatology/keaa061.