Rheumatology International (2026) 46:39
https://doi.org/10.1007/s00296-025-06046-4

Rheumatology
INTERNATIONAL

RECOMMENDATIONS

Consensus statement on mesotherapy for clinical and regulatory practice

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Received: 1 November 2025 / Accepted: 20 November 2025

Abstract

Mesotherapy is an evidence-based, minimally invasive technique used across multiple clinical fields, including pain medicine, sports medicine, rehabilitation, vascular diseases, dermatology, and aesthetic medicine. In recent years, international consensus recommendations have been developed to guide its safe and standardized application. To identify essential criteria for good clinical practice in mesotherapy and to promote their adoption among healthcare professionals and health authorities through a secondary analysis of the current recommendations issued by the Italian Society of Mesotherapy. A multidisciplinary panel of experts reviewed existing evidence-based recommendations and related scientific literature through a structured Delphi process. The analysis aimed to identify key elements that ensure safety, efficacy, and consistency in mesotherapy practice, and to distinguish evidence-supported interventions from outdated or inappropriate procedures. The expert panel formulated 49 evidence-based recommendations covering terminology, clinical use, and ethical aspects. Recommendations reached a high level of agreement (92.6%), confirming the robustness and clinical relevance of mesotherapy. The resulting standards clearly define what should and should not be done in modern mesotherapy practice. Adherence to evidence-based recommendations promotes transparency, patient safety, and professional accountability, while supporting regulatory recognition of mesotherapy as a scientifically grounded therapeutic option. These guidelines provide a framework for standardizing clinical practice, guiding education and research, and ensuring appropriate integration of mesotherapy into individualized treatment pathways. These evidence-based recommendations support harmonization of mesotherapy practice and its recognition by health authorities.

Keywords Mesotherapy · Intradermal injection

Published online: 02 February 2026

Introduction

Mesotherapy is a minimally invasive technique that achieves therapeutic effects through the injection of small doses of active substances into the skin [1, 2]. Over the years, several recommendations have emphasized that mesotherapy should be applied based on an accurate diagnosis, in line with specific pharmacological needs, and tailored to the individual patient [3]. Historically, (Fig. 1) the development of mesotherapy evolved from empirical observations [4]. As early as the mid-nineteenth century, Alexander Wood in Scotland performed the first hypodermic injections (1853), followed by Bartolomeo Guala in Italy, who described systematic hypodermic treatments in hospital practice (1860). Subsequently, Pietro Orlandini proposed dermal punctures for localized pain (1894), and George D. Gammon together with Isaac Starr explored intracutaneous injections of sterile water for analgesic purposes (1941). In 1958, Michel Pistor introduced the term *mesotherapy*, marking the official beginning of the discipline [5]. The foundation of the Italian Society of Mesotherapy (SIM) in 1976 contributed to its scientific recognition, development and structured regulamentation. Later, Sergio Maggiori refined its conceptual framework by introducing the term *Local Intradermal Therapy (LIT)* in 2004, to emphasize the localized pharmacological rationale [3, 6, 7]. Finally, in 2025, the publication of the first international evidence-based guideline established standardized definitions and clinical criteria for the safe and effective practice of mesotherapy [8]. The issue of mesotherapy guidelines is also discussed during various conferences [9, 10]. The article also intends to respond to the need for a common International/European glossary.

According to the definitions supported by the Italian Society of Mesotherapy, increasing emphasis has been placed on the pharmacological relevance of superficial drug administration within the skin layers and its combined local and systemic effects. The pharmacokinetic profile of intradermal administration represents one of the main scientific foundations of mesotherapy and has been extensively investigated in preclinical studies [11].

In fact, experimental data demonstrate that the area under the concentration–time curve (AUC) obtained through the intradermal route is greater than that achieved via intramuscular injection, indicating prolonged local drug availability and a slower systemic absorption rate (Fig. 2).These pharmacokinetic characteristics support the clinical rationale of mesotherapy, which aims to achieve therapeutic efficacy with smaller drug doses, longer dosing intervals, and a reduced risk of systemic adverse effects.

Its mechanisms of action may involve immune, endorphin, glial, and keratinocyte-mediated pathways, as well as the mechanical stimulation induced by needle pricks [3, 4]. The choice of injection site—particularly when targeting trigger points—can significantly influence outcomes. Notably, even saline or sterile water injections can elicit analgesic effects, likely through chemical-physical and osmotic mechanisms [3]. This multifaceted interaction of local, systemic, and neuroimmune factors—together with a potential placebo contribution—is collectively described as "mesodermal modulation" [4]. Moreover, the intradermal route has demonstrated an enhancement of the immune response through a drug-sparing effect, achieving higher antibody titers with lower antigen doses [12]. This approach offers pharmacoeconomic advantages in vaccinations against various pathogens, including influenza, HBV, HPV, and more. These findings have supported the rationale for mesotherapy in various fields of application. Despite certain pharmacokinetic characteristics, mesotherapy is applied in various parts of the world with active substances selected mostly on the basis of personal beliefs. Consequently, some authors have described mesotherapy as a questionable technique [13, 14]. Despite its wide use, mesotherapy lacks globally accepted standards. The aim of this article is to re-evaluate the available evidence in order to provide guidance on

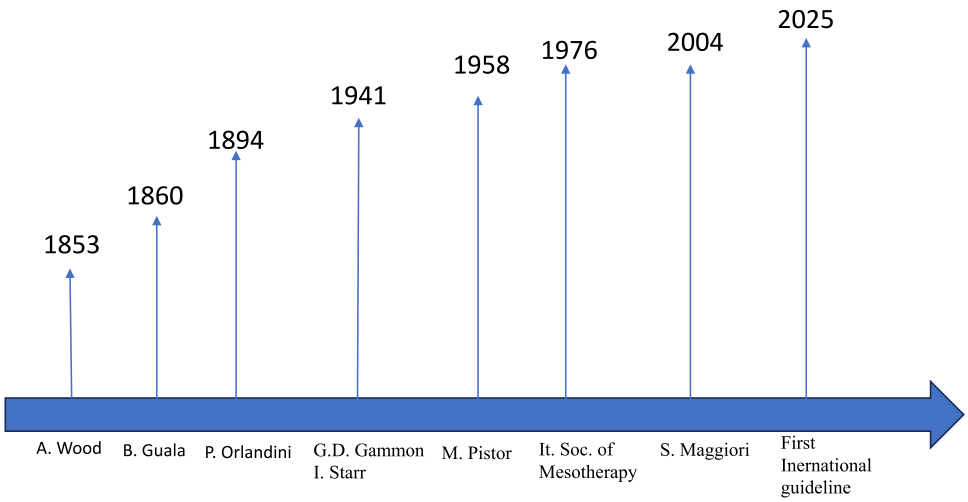

Fig. 1 Evolution of mesotherapy: key milestones, from the first hypodermic injections to the publication of the first international evidence-based guideline (2025)

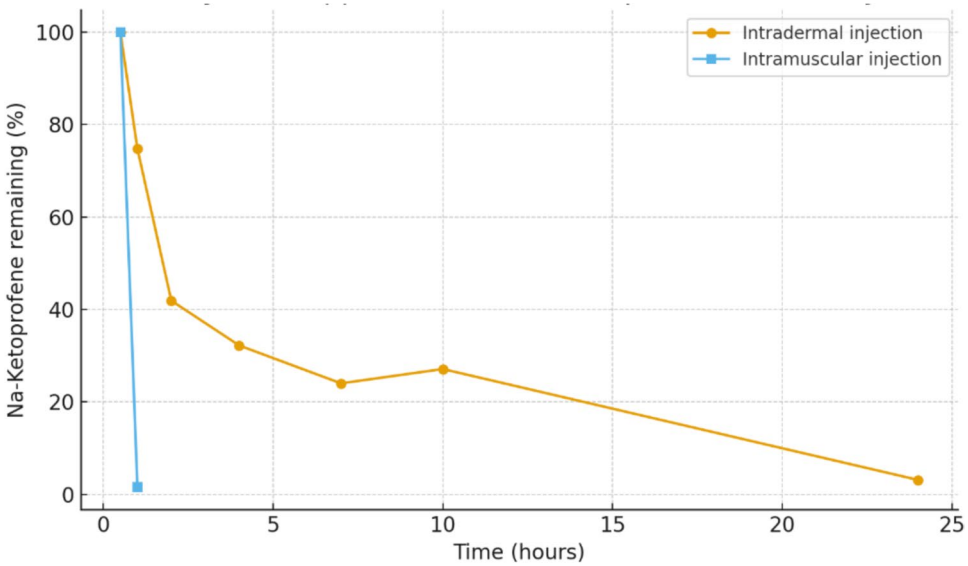

Fig. 2 Velocity of Disappearance of Na-Ketoprofene [data derived from 11]

the appropriate application of mesotherapy, with particular emphasis on its effectiveness and safety, while seeking to minimize the risk of adverse events.

Methods

We reviewed the current recommendations on mesotherapy published in the scientific literature [1, 3, 8]. All these recommendations were developed through structured processes that included comprehensive literature reviews, the formulation of key clinical questions, and multiple rounds of evaluation by international experts. In this study, we analyzed and expanded on the assessments provided by a large multidisciplinary panel of experts, including specialists in pain medicine, general practice, dermatology, sports medicine, phlebology, and rehabilitation, all with extensive clinical experience in mesotherapy. Each expert independently evaluated the recommendations using structured consensus methods. This process allowed us to examine how internationally proposed standards are interpreted and applied in clinical practice, generating insights relevant to both local implementation and broader guideline development. Our ultimate aim was to clarify the current role of mesotherapy in clinical practice and to support its standardization and scientific validation. The recommendations analyzed in this document were those developed through a structured process aligned with international standards for clinical guideline development [8]. Each recommendation was evaluated and discussed through a structured Delphi consensus methodology [15]. The experts addressed key clinical questions, selected relevant evidence, and voted on each proposal using a scoring system that reflected the degree of agreement. This process enabled the identification of practices supported by solid evidence, distinguishing them from outdated approaches or those based solely on personal opinion. Through this evidence-based consensus-driven process, specific answers were formulated for each question. The high level of agreement among participants led to the development of 49 recommendations, which now serve as an international reference for clinical practice (Table 1). These recommendations are designed to promote effectiveness, safety, and the standardization of mesotherapy application.

Results

The recommendations were structured and voted by a large group of experts from various countries and there is a strong consensus among experts regarding the recommendations for an update and upgraded mesotherapy practice, with an agreement rate of 92.58%. The mean score of 4.73 ± 0.5 (out of 5) further confirms the high level of approval. The abstention rate (6.48%) is relatively low, suggesting only minor uncertainty or neutrality among a few evaluators, while the disagreement rate is nearly negligible (0.93%), indicating broad recognition that outdated or inappropriate practices should no longer be used. Overall, these results reinforce the credibility of these recommendations and support their adoption as a shared clinical standard [8].

The 92.58% agreement rate underscores the strong scientific validity and shared acceptance of the recommendations. This level of consensus reflects a robust alignment with current evidence and confirms the reliability of the proposed clinical standards for mesotherapy practice. Conversely, the minimal disagreement rate of only 0.93% should be interpreted not as a sign of methodological weakness, but rather as the wide convergence of individual expertise, developed

Table 1 Evidence-based recommendations for the application of mesotherapy

N°	Mesotherapy recommendations
1	The term ‘mesotherapy’ describes the technique with which microinjections are performed into the thickness of the skin for preventive, curative or rehabilitative purposes
2	The term 'local intradermal therapy' describes the technique with which a series of microinjections are performed in the superficial dermis of a specific skin area
3	Mesotherapy is performed with a 4 mm (27 Gauge) or 13 mm (30 G—32 G) needle. Depending on the length of the needle and the thickness of the skin to be treated, the angle of inclination and the insertion depth of the needle itself will vary
4	To carry out local intradermal therapy, the formation of micro drug deposits in the dermis (wheals) is recommended, to obtain which 0.1–0.2 ml of liquid must be inoculated for each single microinjection
5	The distance between one microinjection and another varies from 1 to 2 cm
6	Mesotherapy must be performed strictly observing the rules of asepsis
7	If the use of two active ingredients is necessary, the administration of the individual products in different syringes and in different inoculation sites is recommended
8	Multi-injectors are not recommended
9	The effect of mesotherapy depends on the predominantly local action of the injected drug to which systemic absorption, reactions induced by the needle, tissue distension caused by the liquid, cell-mediated and neuro- immune reactions can contribute
10	Intradermal administration produces a series of wheals that constitute a 'reserve' from which the drug is slowly absorbed with the aim of prolonging its effect
11	Mesotherapy allows a drug-sparing effect and an efficacy comparable to that of systemic therapy
12	The intradermal route induces an antibody response equal to or greater than the intramuscular route, but with a lower dose of antigen
13	To apply mesotherapy, the use of active ingredients indicated in the pathology or symptom to be treated is recommended
14	In mesotherapy it is recommended to use injectable products and to consider those not indicated for mesotherapy route as off label
15	The use of mixtures is permitted only if the products have authorization for use in combination or if they have efficacy and tolerability studies
16	Mesotherapy represents an option in the management of localized musculoskeletal pain
17	Mesotherapy is recommended in the management of localized pain when the drug- sparing effect and the potential lower systemic pharmacological impact represent an advantage
18	It is recommended to determine the frequency, number of sessions and duration of treatment based on the clinical response
19	Mesotherapy is applicable in individual rehabilitation programs
20	Mesotherapy is applicable in Sports and Exercise Medicine
21	Mesotherapy applied in Sports and Exercise Medicine must take anti-doping regulations into account
22	Mesotherapy is applicable in Chronic Venous Disease for the management of signs and symptoms, to limit its evolution and prevent complications
23	Mesotherapy is applicable in the management of fibro-sclerotic edematous panniculopathy (PEFS)
24	Mesotherapy is applicable in the management of some dermatological conditions
25	Mesotherapy represents an option in the treatment of alopecia
26	Mesotherapy represents an alternative or combination therapy in the treatment of melasma in patient’s refractory to first line therapy
27	Lesion (or aesthetic condition) must be framed from a medical point of view in order to identify the rationale for treatment with mesotherapy
28	Mesotherapy can be considered in the management of some blemishes if the goal of treatment is rational and if the patient shares the risk/ benefit
29	Mesotherapy is applicable in the treatment path of patients also in combination with other treatments
30	The treatment algorithm, in each area of application of mesotherapy, must take into account the clinical response
31	Mesotherapy must be applied in a personalized treatment path, after a diagnosis and an accurate pharmacological, allergy and pathological history
32	Mesotherapy can be suggested exclusively to patients who have undergone a medical examination from which a rationale in favor of localized treatment has emerged
33	In the individualized treatment path, mesotherapy can be used in combination with other therapies, pharmacological or non-pharmacological or alone when other options with proven efficacy have failed
34	Mesotherapy must be performed by medical personnel and cannot be delegated to another healthcare professional
35	Mesotherapy must be performed in patients who have undergone a medical examination from which a rationale in favor of this treatment has emerged
36	Mesotherapy must not be applied in subjects with absolute contraindications due to the technique or the injected product
37	Mesotherapy must be performed in a suitable environment to guarantee asepsis and infection prevention standards
38	Every adverse event must be recorded in the patient’s medical record and communicated to the health authorities according to current regulations
39	Before introducing mesotherapy into the individual treatment path, the doctor must explain its advantages and limitations, the product or products used, and obtain written informed consent

Table 1 (continued)

N°	Mesotherapy recommendations
40	Information documents provided to the patient to obtain informed consent must be based on current guidelines
41	It is recommended to fill in the clinical record with diagnosis, products used and their quantity injected, number of sessions and results obtained
42	Mesotherapy must be considered like any other off-label therapy even in minor patients, when the product, the route of administration, the age of the patient does not fall within the authorization of the injected drug
43	Teaching and updating of mesotherapy must be based on current guidelines
44	Researchers are recommended to draw up protocols useful for a better understanding of the mechanism of action and the role of mesotherapy in treatment pathways
45	Clinicians are recommended to publish data relating to mesotherapy with a description of the technique used and use methods of collecting results according to validated methodologies
46	The use of the superficial infiltration technique applied to the oral mucosa (known as 'oral mesotherapy') has promising data, but should be shared with the patient as an experimental technique
47	Patients' suggestions must be considered in the drafting and periodic revision of mesotherapy guideline
48	Mesotherapy for analgesic purposes must be integrated into the individual path of care and assistance of the individual patient
49	The patient has the right to be subjected to mesotherapy based on scientific evidence

in many years of clinical practice. The high agreement confirms the importance of continued education and knowledge translation to bridge the gap between clinical habit and scientific rigor.

What should be done and what must not be done in modern mesotherapy practice

In light of officially recognized recommendations on mesotherapy, it is now possible to clearly distinguish between acceptable clinical practices and those that must be considered outdated or inappropriate. Based on these results, the scientific committee has developed a series of specific guidelines, for example, explaining what is recommended and what is strongly discouraged. Based on these results, the scientific committee has developed a series of specific guidelines, for example, explaining what is recommended and what is strongly discouraged (Tables 2, 3). During the evaluation of the 49 recommendations, the experts engaged in multiple rounds of discussion to determine which recommendations had the greatest impact on mesotherapy practice. They subsequently defined the minimal data set of procedures to be implemented and those to be avoided, according to the supporting evidence.

These activities were calibrated against the available data on efficacy and tolerability, as well as the records of adverse events reported over the past decades. By adhering to these updated standards, clinicians can ensure that mesotherapy is practiced safely, ethically, and effectively, in line with the latest scientific evidence and according to a patient-centered approach.

Potential impact and future directions

Regulatory implications

The nationwide implementation of these recommendations could foster the formal recognition and regulatory standardization of mesotherapy practices. Establishing common clinical and safety standards across healthcare systems would promote consistency, transparency, and accountability. By aligning mesotherapy with evidence-based medicine principles and rational drug use, health authorities can better evaluate its inclusion within national therapeutic frameworks. Such standardization would also facilitate accreditation processes, define quality indicators for clinical governance, and contribute to reducing variability in practice. Ultimately, these measures are expected to enhance patient safety, optimize therapeutic outcomes, and ensure the sustainable use of healthcare resources.

Governance and professional standards

To support this process, the Italian Society of Mesotherapy (SIM) in 2021 appointed a multidisciplinary panel of experts to define a set of minimum clinical and regulatory standards. These criteria were designed to guide practitioners and institutions in the correct and safe use of mesotherapy. Through multiple structured evaluation rounds, the panel developed a list of recommendations enabling healthcare professionals to self-assess compliance with officially recognized guidelines (Table 4). The recommendations of this secondary analysis further support and enahance the practice in Mesotherapy following the concepts of a Good Clinical Practice.

Table 2 Evidence-based good practices in mesotherapy ("What should be done")

What Should Be Done (Evidence-Based Good Practices)
1. Use the term "mesotherapy" to describe microinjections into the skin for therapeutic purposes (Rec. 1).
2. Use the term "local intradermal therapy" for more superficial treatments of the dermis (Rec. 2).
3. Use appropriate needles (4 mm or 13 mm) and techniques based on anatomical and procedural needs (Rec. 3).
4. Create microdeposits of medication (wheals) by injecting 0.1–0.2 ml of solution per site, recording the number of wheals and the total amount of medication injected in the medical record (Rec. 4).
5. Maintain appropriate distance between injections according to therapeutic needs (1–2 cm) (Rec. 5).
6. Strictly observe aseptic techniques (Rec. 6).
7. Inject active substances indicated for the specific condition being treated (Rec. 13).
8. Use only injectable products, specifying if they are off-label (Rec. 14).
9. Use mesotherapy when its pharmacological savings potential and local effectiveness are supported by scientific rationale and tailored to the patient's needs (Rec. 11, 17).
10. Base the frequency and duration of treatment on the patient's response (Rec. 18).
11. Apply mesotherapy in musculoskeletal pain, sports medicine, rehabilitation, venous diseases, dermatology, and other validated and supported areas (Rec. 16, 20, 22, 23, 24).
12. Personalize the treatment based on an accurate diagnosis and the patient's clinical history (Rec. 31, 35).
13. Mesotherapy may be combined with other validated treatments when appropriate (Rec. 33).
14. Ensure that only qualified medical personnel perform mesotherapy (Rec. 34).
15. Obtain informed consent with clear documentation in accordance with guidelines (Rec. 39, 40).
16. Record all clinical procedures, outcomes, and adverse events in the medical record (Rec. 38, 41).
17. Treat minors only in compliance with ethical and legal standards set by national regulations (Rec. 42).
18. Prefer continuing education provided by ethically sound institutions and support research for the development of mesotherapy (Rec. 43, 44, 45).
19. Always consider the patient's perspective in guideline development (Rec. 47).
20. Recognize the patient's right to receive scientifically supported care, including when mesotherapy is proposed in the treatment plan (Rec. 49).
21. Propose oral mesotherapy only as experimental until further studies confirm its efficacy and tolerability (Rec. 46).

Table 3 Outdated or non-compliant practices in mesotherapy ("What must no longer be done")

What Must No Longer Be Done (Outdated or Non-Compliant Practices)
1. Avoid selecting medications based solely on personal beliefs or anecdotal experience.
2. Do not use multi-injectors, as they compromise injection precision and sterility (Rec. 8).
3. Avoid mixing multiple drugs unless officially approved for combined use (Rec. 15).
4. Do not treat patients without a prior diagnosis and scientific rationale supporting the use of mesotherapy (Rec. 32, 36).
5. Do not delegate treatment to non-medical personnel (Rec. 34).
6. Do not perform procedures without informed consent or proper documentation (Rec. 39, 41).
7. Avoid using substances not indicated or lacking safety/tolerability evidence (Rec. 13, 14).
8. Do not ignore the obligation to report adverse events (Rec. 38).
9. Refrain from treating in non-sterile environments (Rec. 37).
10. Do not apply mesotherapy to individuals with contraindications to the technique (Rec. 36).

Research and educational priorities

Further efforts are required to consolidate mesotherapy's role in modern medical and regulatory contexts. Future research should prioritize high-quality randomized controlled trials and pharmacokinetic studies to strengthen the scientific foundation and therapeutic rationale of mesotherapy. Parallel to this, the development of accredited educational programs—aligned with national and international standards—will be essential to ensure the competence of healthcare professionals and to promote uniform clinical application.

International harmonization and data integration

Multidisciplinary collaboration among regulatory agencies, professional societies, and academic institutions is crucial to harmonize standards and promote transparency. The integration of real-world data and patient-reported outcomes into national health databases will further support continuous quality improvement, post-market surveillance, and evidence-informed policymaking. These coordinated actions will help position mesotherapy as a recognized, regulated, and evidence-based therapeutic approach, strengthening its credibility within the healthcare system and its acceptance

Table 4 Minimum standards for evidence-based mesotherapy practice (Self-certification criteria)

Core Principles and Minimum Standards for Evidence-Based Mesotherapy Practice
1. Every patient has the right to receive treatments based on scientific evidence, provided after obtaining informed consent. Any off-label use must be explicitly communicated to the patient and requires written informed consent.
2. Mesotherapy is performed only by physicians who are specifically trained and continuously updated.
3. Mesotherapy is applied in musculoskeletal pain, sports medicine, rehabilitation, venous diseases, dermatology, aesthetic medicine, and other fields supported by scientific evidence.
4. Every treatment is personalized based on a thorough medical history and accurate diagnosis.
5. Only substances specifically indicated in their technical data sheet are used for the patient's condition.
6. Strict aseptic techniques are always observed.
7. Needles of 4 mm or 13 mm are used with techniques appropriate to the injection site, and multiple-injector devices are not used.
8. Only injectable products are used, and mixtures of drugs not expressly approved for combined use are not injected.
9. A volume of 0.1–0.2 mL of solution is injected per site; the number of injections and the total amount of substance injected per session are recorded.
10. The frequency of sessions and the duration of the therapeutic cycle are determined and adjusted according to the individual patient's clinical response.

among clinicians, regulators, and patients alike. Least but not last, this initiative will allow the possibility to aggregate data for future scientific production, based on reliable and wide sample sizes, able to give new information and more evidence in every field of Mesotherapy practice. Adherence and compliance with these recommendations will be seen as a marker of quality and scientific strengthen.

Mesotherapy can be effectively integrated into multimodal treatment strategies, following recommended algorithms tailored to patient needs

Mesotherapy has been successfully combined with other therapies in the management of localized pain, as well as in phlebological and dermatological applications. By reducing drug dosages and minimizing potential interactions, mesotherapy is particularly suitable for at-risk populations, such as elderly patients or those receiving polytherapy. This approach improves both treatment tolerability and overall effectiveness. Evidence-based algorithms have been proposed to support a rational use of mesotherapy, either as a standalone intervention or in combination with other therapeutic strategies [2] (Fig. 3). Synergistic effects have been reported in dermatology, musculoskeletal pain management, and phlebology [2, 4]. Looking ahead, the integration of mesotherapy with other modalities warrants further investigation, especially within the framework of multimodal management. Possible future scenarios of modern and structured mesotherapy could be its inclusion in preventive strategies to manage perioperative pain and minimize the possible transition to chronic postoperative pain, according Enhanced Recovery After Surgery (ERAS) protocols [16]. This consensus not only complements the previous review but also offers a framework that may support more consistent research reporting, facilitate regulatory interpretation, and guide safer integration of mesotherapy into rheumatologic and musculoskeletal practice.

Limitations of this document

The present recommendations are based on studies conducted in different countries using heterogeneous methodologies, patient populations, and clinical contexts. This variability limits the comparability and generalizability of available data. Moreover, much of the current evidence on mesotherapy derives from expert consensus rather than large, high-quality randomized controlled trials (RCTs). Key methodological limitations include the heterogeneity of treated conditions, limited pharmacokinetic and pharmacodynamic data, and a lack of long-term safety and efficacy studies. In addition, inconsistent reporting of adverse events and outcomes, as well as differences in regulatory frameworks and drug approvals between countries, further constrain systematic evaluation. We are fully aware of the limitations imposed by the absence of large, long-term randomized controlled trials and acknowledge that, in many countries, mesotherapy is often applied without adequate supervision or standardized clinical oversight. Numerous adverse events reported in the literature have been associated with the inappropriate or unskilled use of mesotherapy techniques. Nevertheless, the present consensus aims to raise awareness among clinicians and decision-makers about the importance of evidence-based mesotherapy. By promoting adherence to current evidence and standardized good clinical practice, this document seeks to foster a more appropriate, safe, and scientifically grounded use of mesotherapy in routine clinical and regulatory contexts. A recent systematic review analyzed 30 studies involving patients affected by skin infections that developed after mesotherapy treatments performed for aesthetic purposes [17]. Most cases originated from South America and involved women

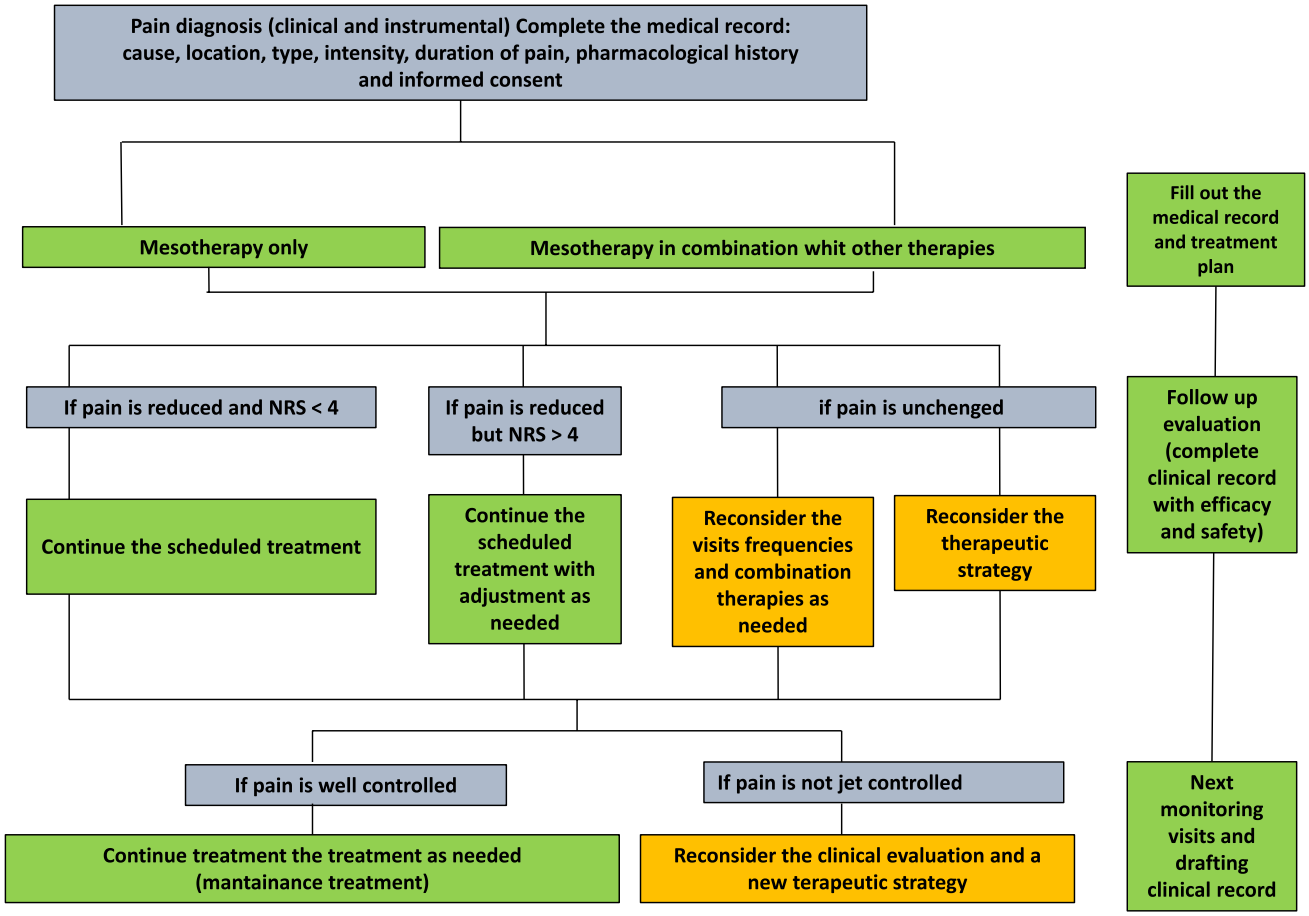

Fig. 3 The figure shows the treatment algorithm for mesotherapy

aged between 16 and 55, who had received injections on the thighs, buttocks, and abdomen. The authors emphasize that mesotherapy, when carried out in unregulated settings or by unqualified personnel, poses a significant risk of infections that are difficult to treat and may result in undesirable cosmetic outcomes. Our recommendations appear necessary and urgent to prevent the spread of aesthetic mesotherapy performed by inexperienced practitioners, which could undermine the proper use of this valuable drug-sparing technique in other medical applications.

Conclusions

Mesotherapy is now practiced worldwide, offering therapeutic benefits across a wide range of medical conditions. The present evidence-based recommendations were developed through a structured and transparent expert consensus, aimed at supporting both physicians in daily clinical practice and health authorities in defining coherent regulatory and organizational frameworks to ensure the safe and appropriate use of mesotherapy. They represent a foundation for constructive dialogue between scientific societies, practitioners, and public health institutions, fostering the progressive alignment of national standards with internationally recognized best practices. These recommendations not only clarify how and when mesotherapy should be performed effectively, but also identify practices that must be discontinued. Their systematic adoption will help to protect patients, promote standardized and high-quality care, and safeguard mesotherapy from inappropriate or non-compliant use by unqualified practitioners. Finally, ongoing research, open institutional collaboration, and future studies will allow for periodic updates of these recommendations, ensuring that they might evolve the common International/European glossary in accordance with emerging evidence, ethical principles, and regulatory developments. These recommendations represent a foundational step toward the global standardization of mesotherapy practice. This article represents a novel reference point in the international literature, highlighting the urgent need to standardize the mesotherapy technique to ensure patient safety. It provides clinicians and healthcare decision-makers with an initial set of shared recommendations to guide the optimal therapeutic approach to mesotherapy.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s00296-025-06046-4.

Acknowledgements We would like to thank Ennio Sarli for the statistical analyses, as well as the patient associations that participated in the review process for their valuable contributions.We also thank the following colleagues for participating in the development of the international guidelines from which the principles set out in this publication arise: Alves Joao Ca (Portugal), Coulon Jean-Michel (France), Descamps Franck (Belgium), Erguven Nedret (Turkey), Fuck Monica (Austria), Kaplan Andrew (Israel), Knoll Britta (Germany), Miller Blanca (Mexico), Mouhli Najla (Tunisia), Nermin Yusuf (Egypt), Ordiz Ignacio (Spain), Rada Sergio Alejandro (Colombia), Rana Ajay (India), Sevaljevic Wilson Claudia (Switzerland), Sindel Dilsad (Turkey), Tseveendori Narangerel (Turkey), Weid Sabine (Austria), Aloulou Ines (Tunisia).

Author contributions MM, DR, ME, and KK contributed to the conceptualization of the study. All other authors participated in the Delphi method process and approved the final content of the publication. All authors take full responsibility for the integrity and accuracy of all aspects of the work.

Funding No specific funding was obtained for this manuscript.

Data availability Datasets generated and/or analyzed during the current study are not publicly available but are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest No external funding received. None of the participants received funding from private entities for the drafting of this article. All authors involved in the writing of the article adhere to the ethical code available at the following link: https://www.societadimesoterapia.it/documenti-SIM/SIM-ethical-code.pdf

Ethical approval Ethical review and approval were waived for this study as it did not involve human participants or patient data.

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