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ATRAUMATIC RENEWAL OF PERMANENT MAKEUP: PRINCIPLES FOR WORKING WITH SENSITIVE FACIAL AREAS

Summary. *The article formulates a theoretical and practical rationale for an atraumatic approach to the renewal of permanent makeup (PM) specifically for clients with compromised skin. The relevance of the topic is dictated by the growing number of patients with age-related skin changes (atrophy, thinning) and hypersensitivity (rosacea, post-acne), as well as clients who have previously undergone pigment removal procedures. Such skin requires fundamentally different, highly delicate implantation protocols. The aim of the study is to systematize the principles of atraumatic implantation for aging and reactive skin, focusing on techniques for the eyebrow, eyelid, and lip zones. The presented methodology is based on minimizing procedural trauma through controlled superficial pigment deposition, which is critical for preventing complications and achieving predictable aesthetic results on compromised skin. The material is addressed to practicing specialists in aesthetic medicine and permanent makeup who seek to optimize protocols for complex clinical cases.*

Key words: *permanent makeup renewal, atraumatic technique, aging skin, sensitive skin, rosacea, post-acne skin, post-removal skin, delicate implantation, compromised skin.*

Introduction. The permanent makeup industry has shown rapid, essentially exponential, expansion in recent years: from a highly specialized service it has transformed into a substantial segment of the global beauty market.

According to analytical estimates for 2024, Europe dominated the global permanent makeup market, accounting for the largest market share of 72.38% [1]. Growth is fueled by three mutually reinforcing factors: consumers' desire to minimize daily time costs for makeup, the amplified influence of social media that popularize aesthetic interventions, and rising disposable incomes that allow long-term investments in appearance [3; 4].

As PM practices expand, the number of requests for renewal is naturally increasing. Clients present not only with faded pigment but with skin that is structurally complex. This includes aging skin (characterized by epidermal thinning and loss of elasticity), hypersensitive skin (with conditions like rosacea or post-acne), and skin that has been previously traumatized by various removal procedures. Such compromised skin requires fundamentally different, highly delicate implantation protocols, as standard techniques can lead to poor healing, pigment migration, or further trauma [5; 6].

Thus, a substantial research deficit is evident: there is no unified, scientifically validated protocol for pigment implantation on compromised skin. Most training focuses on healthy, intact skin. Practitioners lack clear guidelines on how to adapt their technique for atrophic aging skin, inflamed sensitive skin, or fibrotic post-removal skin. The prevailing practice is fragmented: a specialist may know how to implant pigment, but not how to manage the unique histological challenges of reactive or structurally weakened tissue.

The aim of the study is to develop and theoretically substantiate an atraumatic renewal technique specifically for aging, sensitive, and post-removal skin in the eyebrow, eyelid, and lip zones, based on principles of minimal tissue trauma and superficial implantation.

The scientific novelty consists in systematizing the technical principles of delicate pigment implantation adapted for complex skin types (e.g., rosacea, post-acne, atrophic) which are often contraindicated by standard protocols.

The author's hypothesis is based on the premise that the application of a

specialized, low-trauma implantation technique makes it possible to safely and effectively renew PM on aging and sensitive skin, achieving predictable aesthetic results while minimizing complications like pigment migration or inflammation.

Materials and methods. The methodological framework of the study was designed as a systematic review with subsequent synthetic synthesis of the literature, conducted based on a targeted search in the bibliographic databases PubMed, Scopus, and Web of Science. The search strategy was built around key terms: "atraumatic permanent makeup", "aging skin histology", "micropigmentation in sensitive skin", "rosacea permanent makeup", "post-acne micropigmentation", "post-removal skin healing", "delicate implantation techniques". The selection included publications from recent years in peer-reviewed outlets, relevant to the stated topic and containing empirical data.

Additionally, a content analysis of industry reports from leading analytical platforms — Fortune Business Insights, Allied Market Research, and Data Intelo — was performed to substantiate the relevance of the work by comparing market indicators.

The practical component and the development of protocols were based on clinical observations and the adaptation of micropigmentation principles to the histological specificities of compromised skin.

Results and discussion. The choice of a strategy for correction or removal of permanent makeup in the lip area is a decision of high significance that predetermines both the final aesthetic outcome and the likelihood of undesirable consequences. The two basic approaches — laser ablation of the pigment and the use of chemical removers — are based on fundamentally different biophysical mechanisms and, consequently, have different profiles of indications and contraindications.

The principles of atraumatic PM renewal are directly related to the client's skin condition, which is often compromised by previous removal procedures. Understanding how these removal methods affect the tissue is key to delicate

implantation [7; 9]. Laser technologies, based on selective photothermolysis, fragment the pigment [8]. However, besides acting on the pigment, the high-energy pulses (especially nanosecond) dissipate heat into the dermis. For aging skin, this means additional thermal stress that can exacerbate atrophy and thinning. For sensitive skin with rosacea, this provokes an excessive inflammatory response and erythema. Post-laser skin, even when healed, often has an altered histological structure and increased fragility, making it unresponsive to standard implantation techniques [20].

Chemical removers (acidic or alkaline) work via transepidermal elimination, inducing a controlled chemical injury and inflammation [13]. Their main problem is non-selectivity and a high risk of trauma. Even with correct use, the healing process often leads to the formation of fibrotic (scar) tissue. This tissue is dense, less vascularized, and inelastic. Attempting to implant pigment into such fibrosis using standard methods leads to poor retention, pigment migration, and "shattering" of the scar [11; 14].

The choice of an optimal removal strategy cannot be reduced to a simplistic opposition laser vs. remover; it is a multistage diagnostic task that begins with an attempt to verify the chemical composition of the dye. The key practical difficulty lies in the fact that manufacturers rarely disclose a complete and accurate composition, creating an informational vacuum. The unified recommendation to use a wavelength of 532 nm for red pigments on the lips can lead to severe consequences if iron oxides or titanium dioxide are present in the composition: induced color inversion sharply complicates, prolongs, and increases the cost of further correction. Hence the need for a risk-oriented protocol: taking the history (pigment brand, time since implantation), visual assessment of the shade (light, flesh, bright pink tones — a high-risk zone), and, critically, mandatory performance of a test patch on a low-visibility area before full-scale treatment.

Summarizing the results of such an analysis, for the lip area and other sensitive zones a method selection protocol is proposed, presented in Table 1.

Table 1

Impact of removal methods on skin condition and subsequent implantation protocols

Criterion	Post-Laser Skin	Post-Remover Skin
Main Consequence	Thermal stress, tissue densification or thinning, increased sensitivity.	Chemical burn, high risk of fibrosis (scarring), uneven texture.
Tissue State	Fragile, often dehydrated. Hyperemic in cases of rosacea.	Dense, rigid, fibrotic. Impaired elasticity.
Implantation Risks	Pigment migration due to fragility, poor retention, severe swelling.	Needle "going too deep," uneven deposition, further scarring.
Required Protocol	Maximally superficial, delicate implantation. Light "air-powder" shading. Working at minimal machine speed.	Preparatory work to soften the scar. Layer-by-layer, superficial deposition. Often requires more sessions.

Based on these post-traumatic skin conditions, the atraumatic renewal of PM requires a fundamental shift from standard protocols.

1. Principles of Working with Aging Skin (Especially After Removal). Aging skin is characterized by epidermal thinning, reduced collagen and elastin. When this skin has also undergone removal (laser or chemical), its structure is further compromised. This skin is extremely fragile and demands a supremely delicate implantation protocol.

- **Minimized Pressure and Passes:** The specialist must work with exceptionally light pressure ("barely-touch" technique) to avoid breaching the thinning dermal-epidermal junction.
- **Superficial Deposition:** Pigment must be implanted strictly within the upper papillary dermis. Deep implantation in atrophic skin almost guarantees a cool, blurred result.
- **Layered Application:** Color density is built up over multiple, low-trauma sessions.

2. Working with Hypersensitive and Reactive Skin (Rosacea, Post-Acne). Hypersensitive skin presents a different challenge: managing inflammation. The trauma of implantation itself can trigger a pronounced vascular or inflammatory

response.

- Clients with Rosacea: This skin is characterized by persistent erythema and telangiectasias. The goal is to minimize the number of passes, work quickly and very lightly to avoid provoking severe bleeding (which pushes pigment out) and prolonged redness.

- Clients with Acne or Post-Acne: The skin has an inconsistent texture (atrophic scars, enlarged pores). The technique must be "pixelated" and superficial to minimize the risk of post-inflammatory hyperpigmentation (PIH).

3. Adaptation of Techniques for Delicate Zones (Eyebrows, Lips, Eyelids)

- Eyebrows: For aging or rosacea-prone skin, dense, saturated techniques are contraindicated. A soft, "airy" powder shading is preferred (fig.1).



Fig. 1. Atraumatic eyebrow renewal (before and after)

- Lips: Aging lips often lose volume, and their vermilion border thins. Post-removal tissue can be fibrotic. The technique must be superficial

("watercolor") to avoid migration and cool tones (fig.2).



Fig. 2. Delicate renewal of permanent lip makeup (before and after)

- Eyelids: As the thinnest skin, the eyelids (especially on aging clients) tolerate zero procedural aggression. The technique is limited to pointillist (pixel-by-pixel) implantation, often with minimal or no anesthesia to maintain full control of the depth [16, 19] (fig.3).



Fig. 3. Example of atraumatic shadow shading on the eyelids

Medical dermopigmentation has a pronounced psychotherapeutic component. In patients after oncologic diseases, trauma, or with chronic dermatoses, noticeable aesthetic defects often trigger significant psychological distress, promote social isolation, depressive symptomatology, and anxiety disorders [17]. Under these conditions, dermopigmentation goes beyond a purely cosmetic procedure and functions as a full-fledged psychosocial rehabilitation intervention. Recreating the natural appearance of the areola after mastectomy or effectively camouflaging a facial scar can radically transform self-attitude, restore a sense of control over the situation, and substantially improve quality of life.

This shift from a disease-treatment paradigm to the restoration of personal wholeness is reflected in exceptionally high satisfaction metrics. According to a systematic review of 18 studies involving approximately 900 patients, the mean satisfaction level with medical tattooing outcomes reaches 91.7% [18].

Thus, medical dermopigmentation should be understood not as an autonomous manipulation, but as a significant—and often final—component of

comprehensive management protocols for certain dermatologic and surgical patients. Its inclusion in standard rehabilitation pathways can substantially enhance clinical effectiveness and increase patient satisfaction with the achieved esthetic and functional outcome.

The complexity of permanent makeup procedures, especially in correction and in medical indications, necessitates a transition from individualized practice to coordinated interdisciplinary collaboration. Given infectious and allergic risks, the possibility of unsatisfactory esthetic results, and the absence of unified state standards for training and licensing of PM specialists, close cooperation with physicians of related specialties becomes a priority. Formation of an integrative model that combines the expertise of a dermatologist, plastic surgeon, and dermopigmentation specialist is a key condition for improving the safety and quality of services provided.

In such a model, participant roles are clearly determined:

- Dermatologist: Conducts primary skin diagnostics, determines absolute and relative contraindications (including active dermatoses, a tendency toward keloid formation, psoriasis exacerbation), advises on risks of sensitization to pigment components, and performs patch testing if necessary. Provides medical follow-up of healing and prescribes therapy in case of complications.

- Plastic surgeon: Optimizes the timing of camouflage for postoperative scars. In the presence of an uneven scar surface (hypertrophic, atrophic), performs preliminary preparation—laser resurfacing, subcision, or excision—to create a more even surface suitable for dermopigmentation.

- PM specialist (dermopigmentation specialist): Performs the procedure directly. Requires impeccable technical skills and artistic vision combined with deep knowledge of coloristics, pigment chemistry, and asepsis/antisepsis principles. Implements the technical part of the jointly developed plan.

The patient management algorithm within the interdisciplinary approach is presented as a flowchart (Fig. 4).

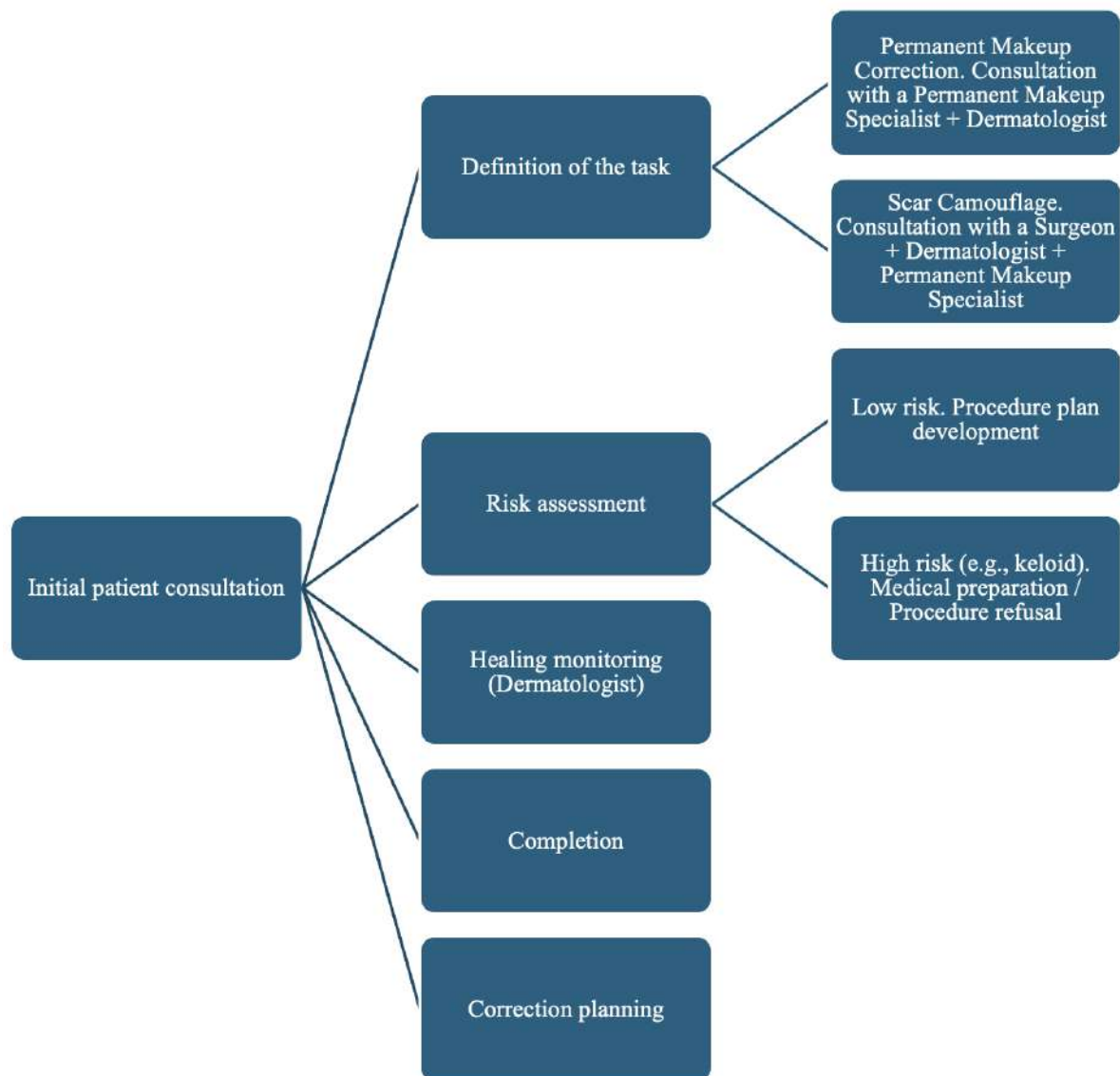


Fig. 4. Flow chart of the interdisciplinary patient management protocol

Source: compiled by the author

Despite the evident advantages, the practical implementation of such a model encounters substantial constraints. Key among them are the shortage of formalized educational pathways and certification systems for medical dermopigmentation specialists, the fragmentation and variability of legal regulation across countries and regions, and insufficient awareness within the professional medical community of the capabilities and evidence-based potential of contemporary permanent makeup.

The trajectory of further development is defined by overcoming these barriers. It is necessary to launch interdisciplinary educational programs for physicians and PM practitioners, to establish national standards and clinical guidelines for medical dermopigmentation, and to incorporate the corresponding services into official management protocols and fee schedules of dermatology and plastic surgery clinics, as already demonstrated by best practice. This will simultaneously enhance patient safety and institutionally formalize the profession of the PM practitioner as a significant member of the multiprofessional team in aesthetic medicine.

Conclusion. This study systematizes an atraumatic approach for the renewal of permanent makeup, shifting the specialist's focus from mere pigment application to the active preservation of skin integrity. The principles of working with aging, post-removal, and hypersensitive (rosacea, post-acne) skin are fundamentally different from standard protocols. They require advanced skills, a deep understanding of tissue response, and the consistent application of delicate, low-trauma implantation techniques. By prioritizing skin health over pigment density and building results in gradual, superficial layers, the specialist can safely achieve natural aesthetic renewal even in the most complex clinical cases, significantly improving the client's quality of life without inducing further trauma.

References

1. Permanent Makeup Market Size, Share & Industry Analysis, By Product Type (Devices, Pigments [Microblading and Micropigmentation], and Accessories), By Technique (Microblading and Micropigmentation), By Body Parts (Eyebrows, Lips, Eyelashes/Eyeliners, and Others), By End-user (Specialty Clinics, Spas & Cosmetic Surgery Centers, Cosmetic/Beauty Salons, and Others), and Regional Forecast, 2025-2032. URL: <https://www.fortunebusinessinsights.com/permanent-makeup-market-109710>

(date accessed: 18.09.2025).

2. Permanent Makeup Pigments Market Size, Share & Industry Analysis, By Type (Microblading and Micropigmentation), By Body Parts (Eyebrows, Lips, Eyelashes/Eyeliners, and Others), By End-user (Specialty Clinics, Spas & Cosmetic Surgery Centers, Cosmetic/Beauty Salons, and Others), and Regional Forecast, 2025-2032. URL:

<https://www.fortunebusinessinsights.com/permanent-makeup-pigments-market-112913> (date accessed: 18.09.2025).

3. Is Permanent Makeup a Good Idea in 2025?. URL: <https://www.nouveaucontourusa.com/blogs/news/is-permanent-makeup-a-good-idea-in-2025> (date accessed: 18.09.2025).

4. Opportunities in Permanent Makeup Service Market 2025-2033. URL: <https://www.datainsightsmarket.com/reports/permanent-makeup-service-508695> (date accessed: 19.09.2025).

5. Permanent Makeup Pigment Market Report | Global Forecast From 2025 To 2033. URL: <https://dataintelo.com/report/permanent-makeup-pigment-market> (date accessed: 19.09.2025).

6. Permanent Makeup Market Size, Share, Competitive Landscape and Trend Analysis Report, by Procedure Type (BB Glow Treatment, Microblading, Micropigmentation, Lip Blushing, Permanent Eyeliner, Scar Camouflage, Freckle Tattoos) , by Tool Type (Pigment Machine, Microblading Hand Tools, Needles, Pigments, Topical Anesthetics, Measuring & Drawing Tools, Sterilization Equipment, Others), by Service Provider (Specialty Clinics, Cosmetic & Beauty Salons, Spas & Cosmetic Surgery Centers, Others), by End User (Male, Female, Others) : Global Opportunity Analysis and Industry Forecast, 2024 - 2033. URL: <https://www.alliedmarketresearch.com/permanent-makeup-market-A325167> (date accessed: 19.09.2025).

7. Laser Tattoo Removal Procedure, Benefits, and Risks - WebMD. URL: <https://www.webmd.com/skin-problems-and-treatments/laser-tattoo-removal>

(date accessed: 20.09.2025)

8. Kurniadi I. et al. Laser tattoo removal: Fundamental principles and practical approach. Dermatologic therapy. 2021. Vol. 34 (1). <https://doi.org/10.1111/dth.14418>.

9. Tjipta A., Ramadhan H., Lubis R. A. Immune response in laser tattoo Removal: A systematic review. Journal of Lasers in Medical Sciences. 2023. Vol. 14. <https://doi.org/10.34172/jlms.2023.66>.

10. Huang S. et al. A descriptive analysis of the epidemiology and motivations for laser tattoo removal in an underserved population. Journal of Community Health. 2022. Vol. 47 (1). P. 127-135.

11. Aljubran B. A. et al. Challenges in laser tattoo removal: the impact of titanium dioxide on photodegradation of yellow inks. Archives of Toxicology. 2025. P. 1-15.

12. Jimenez G., Weiss E., Spencer J. M. Multiple color changes following laser therapy of cosmetic tattoos. Dermatologic surgery. 2002. Vol. 28 (2). P. 177-179.

13. Hutton Carlsen K., Serup J. Sequels to tattoo removal by caustic products. Skin Research and Technology. 2018. Vol. 24 (4). P. 636-641. <https://doi.org/10.1111/srt.12578>.

14. Wollina U. Depigmentation and hypertrophic scars after application of a fluid lactic acid tattoo eraser. Wiener Medizinische Wochenschrift. 2015. Vol. 165 (9). P. 195-198.

15. Singh R. et al. Effect of 82% lactic acid in treatment of melasma. International scholarly research notices. 2014. Vol. 1. <https://doi.org/10.1155/2014/407142>.

16. Moulton K. L. Exploring tattoo artists' understanding of decorative non-medical professional tattooing as a method of scar camouflage and decoration. Psychology, Health & Medicine. 2023. Vol. 28 (2). P. 540-547. <https://doi.org/10.1080/13548506.2022.2057556>.

17. Adamson L., Selby A. The case for skin camouflage in the management of upper limb scarring—A case series. *Hand Therapy*. 2021. Vol. 26 (3). P. 113-119. <https://doi.org/10.1177/17589983211007875>.

18. Becker S. J., Cassisi J. E. Applications of medical tattooing: a systematic review of patient satisfaction outcomes and emerging trends. *Aesthetic Surgery Journal Open Forum*. US : Oxford University Press, 2021. Vol. 3 (3). <https://doi.org/10.1093/asjof/ojab015>.

19. Gurnani P. et al. Comparing the efficacy and safety of laser treatments in tattoo removal: a systematic review. *Journal of the American Academy of Dermatology*. 2022. Vol. 87 (1). P. 103-109.

20. Menozzi-Smarrito C., Smarrito S. Laser removal of cosmetic eyebrow tattoos with a picosecond laser. *Dermato*. 2023. Vol. 3 (3). P. 182-192. <https://doi.org/10.3390/dermato3030014>.

21. Bakova D. et al. Monitoring Health Risks Associated with Body Modifications (Tattoos and Permanent Makeup): A Systematic Review. *Cosmetics*. 2025. Vol. 12 (1). P.1-6.