

International Journal of Health, Medicine and Nursing Practice

(IJHMNP)

An Interdisciplinary Framework for Non-Invasive Aesthetic
Support in Post-Orthopedic Recovery



CARI

Journals

An Interdisciplinary Framework for Non-Invasive Aesthetic Support in Post-Orthopedic Recovery

 Oksana Repina

Independent Researcher, Orlando, FL 32819, United States

<https://orcid.org/0009-0001-2994-1766>

Accepted: 15th September, 2026, Received in Revised Form 30th September, 2026, Published: 15th October, 2026

Abstract

Purpose: This paper examines how non-invasive aesthetic support procedures can be integrated into postoperative orthopedic recovery pathways. Orthopedic interventions frequently entail extended recovery periods marked by discomfort, temporary body image concerns, localized swelling, and reduced physical confidence. Conventional rehabilitation prioritizes mobility restoration and functional recovery, leaving supportive aesthetic approaches underdeveloped within existing recovery frameworks.

Methodology: The study developed a patient-centered conceptual model, the Post-Orthopedic Aesthetic Support Framework, through a structured synthesis of the psychosocial, lymphological, and rehabilitation literature. The model was then illustrated by an observational clinical case of a 63-year-old female patient following total hip arthroplasty, assessed over five weeks with Patient-Reported Outcome Measures.

Findings: Two modalities, adaptive pressotherapy and microcurrent stimulation, complement established rehabilitation pathways while maintaining a clear distinction between medical treatment and wellness-oriented support. In the observed case, staged aesthetic support was associated with reduced perceived tissue heaviness, faster subjective resolution of visible hematomas, restored sleep quality, and lower reported anxiety. Improved subjective comfort coincided with higher reported adherence to prescribed physical therapy.

Unique contribution to theory, practice and policy: The framework converts fragmented evidence on compression therapy and psychosocial support into a single operational pathway with explicit professional boundaries. It supplies aesthetic centers with a safety-bounded referral protocol and provides orthopedic services with a structured option for managing superficial soft-tissue distress after discharge. The model is conceptual and practice-oriented, and it requires further clinical validation.

Keywords: *Post-Orthopedic Recovery, Adaptive Pressotherapy, Microcurrent Stimulation, Interdisciplinary Care, Patient-Reported Outcomes*

JEL Codes: *I10, I11, I12*

1. INTRODUCTION

1.1 Context and Background

Modern orthopedic interventions, including joint arthroplasty and trauma reconstruction, restore mechanical function to the musculoskeletal system with high reliability. The period following hospital discharge is far less controlled. Recovery involves interacting physical, cognitive, and emotional factors that require ongoing management (Aasvang, Luna, & Kehlet, 2015). The medical community has responded by adopting a biopsychosocial model of care, which assesses and treats the patient as a whole person rather than focusing exclusively on the localized surgical site (Zale, Ring, & Vranceanu, 2018). This shift generates demand for supportive care models addressing the broader quality-of-life issues patients face during recovery.

1.2 The Gap in Conventional Care

Conventional rehabilitation protocols correctly prioritize the restoration of joint mobility, load-bearing capacity, and pain management. Structured physical therapy nevertheless leaves temporary soft-tissue complications unaddressed. Patients frequently present with extensive postoperative edema, localized hematomas, and general discomfort in the superficial tissue layers. These visible physical changes translate into altered body image and increased psychosocial stress. Patients undergoing major musculoskeletal procedures face a high risk of negative psychological consequences, including anxiety and depressive symptoms (Erwin, Ray, & Han, 2023; Obey & Miller, 2022).

Qualitative feedback confirms that recovery is a multidimensional experience. Individuals adapt to a new physical reality while managing significant emotional burdens tied to temporary physical limitations (Norris, Graham, Wilkinson, Savory, & Robinson, 2023; Sleney et al., 2014). Standard clinical environments contain few structured services targeting aesthetic and superficial comfort issues. Providers recognize the benefits of integrating psychosocial and physical support services, yet they encounter practical barriers such as limited time and fast-paced clinic schedules (Reichman, Briskin, Duarte, Vranceanu, & Grunberg, 2023). The result is a distinct gap: patients are medically stable but continue to experience aesthetic discomfort and reduced physical confidence.

1.3 Objective of the Study

This paper introduces a patient-centered conceptual model, the Post-Orthopedic Aesthetic Support Framework. The framework specifies how non-invasive hardware aesthetics enter the broader recovery ecosystem. It applies adaptive pressotherapy and microcurrent stimulation to reduce visible swelling, accelerate the aesthetic resolution of bruising, and improve subjective patient comfort. The primary objective is to demonstrate how aesthetic practitioners can safely support orthopedic patients without intervening in clinical protocols.

The model establishes explicit boundaries between medical treatment, performed exclusively

by physicians, and wellness-oriented aesthetic support, provided by cosmetologists. Working from qualitative patient feedback and interdisciplinary collaboration, the article supplies practical strategies for implementing supportive aesthetic procedures within the recovery experience.

The horizontal flowchart below maps the synchronized patient journey from the initial surgical event to full recovery (Fig. 1). The process originates from a unified baseline node representing the major orthopedic intervention. Beyond that node the pathway bifurcates into two parallel, non-intersecting operational tracks designed to run concurrently. Track A, medical rehabilitation, delineates the clinical domain managed by the orthopedic surgeon and physical therapist, prioritizing joint mobility, biomechanics, and structural bone healing. Track B, aesthetic and wellness support, establishes the supportive domain of the aesthetic practitioner, targeting non-invasive edema reduction, hematoma resolution, and stress relief through pressotherapy and microcurrent protocols. Both streams converge into a single final milestone focused on enhanced quality of life and rapid social reintegration. The schematic is essential to the argument because it shows that the supportive track never crosses into the clinical track at any point of the timeline.



Figure 1: The Interdisciplinary Recovery Ecosystem

The diagram carries three functional components: a shared entry node, two isolated process lanes with their own instruments and personnel, and a shared exit node. Isolation of the lanes is the safety mechanism of the entire framework, while the shared exit node expresses its rationale, since both tracks are evaluated against the same end goal of patient quality of life.

2. LITERATURE REVIEW

2.1 Psychosocial and Aesthetic Challenges in Post-Orthopedic Recovery

The period following a major orthopedic intervention involves intense physical and emotional adjustment. Surgical trauma produces a high prevalence of psychological distress. Patients frequently experience depressive symptoms, anxiety, and post-traumatic stress after orthopedic surgery (Erwin, Ray, & Han, 2023; Obey & Miller, 2022; Vincent, Horodyski, Vincent,

Brisbane, & Sadasivan, 2015). Catastrophic thinking and poor mental health correlate directly with increased pain perception and higher complication rates (Schemitsch & Nauth, 2020).

Visible physical changes such as severe localized edema, extensive bruising, and temporary mobility loss create additional psychosocial burdens. Evidence from burn care and from negative pressure wound therapy shows that visible tissue damage lowers self-esteem and increases social isolation (Attoe & Pounds-Cornish, 2015; Upton, Stephens, & Andrews, 2013). This burden is not confined to trauma patients. Athletes undergoing orthopedic repair face substantial mental health challenges that depress their physical rehabilitation metrics (Daley, Griffith, Christino, & Milewski, 2021). Psychosocial interventions, including guided relaxation and positive coping strategies, reduce postoperative anxiety and improve exercise compliance (Gennarelli, Brown, & Mulcahey, 2020; Szeverenyi et al., 2018).

2.2 Current Paradigms in Postoperative Soft-Tissue Management

Modern orthopedic care emphasizes fast-track recovery models built on early mobilization, pain control, and reduced hospital stays (Ibrahim, Khan, Nizam, & Haddad, 2013). Optimal function after discharge remains difficult to achieve. Up to thirty percent of patients report moderate to severe pain weeks after surgery, largely because of ongoing tissue inflammation and swelling (Aasvang, Luna, & Kehlet, 2015). Prolonged restriction of movement compounds the problem, producing both physical deconditioning and unaddressed mental health difficulties (Dietrich & Zubler, 2025).

Standard physical therapy targets joint mechanics, and the management of superficial soft-tissue congestion remains limited. Evaluations of traditional physiotherapeutic methods for muscle damage indicate that interventions such as manual massage deliver only minimal clinical relief (Torres, Ribeiro, Duarte, & Cabri, 2012). Manual lymphatic drainage and compression bandaging are recommended in cases of severe swelling, yet evidence for a significant enhancement of overall lymphatic function remains mixed (Klein, Tidhar, & Kalichman, 2020; Majewski-Schrage & Snyder, 2016). Superficial aesthetic recovery of the skin and underlying soft tissues receives little systematic attention.

2.3 Mechanisms of Non-Invasive Hardware Aesthetics

Intermittent pneumatic compression, known in aesthetic practice as pressotherapy, addresses several limitations of manual therapy. Reviews across disciplines report improved limb volume, better quality of life, and reduced infection rates in patients with chronic swelling conditions (Chang & Cormier, 2013; Pandey et al., 2025; Rogan et al., 2016). Aesthetic and sports settings supply converging evidence. Pneumatic compression applied after lipoabdominoplasty reduces abdominal edema and increases patient satisfaction compared with standard compression garments alone (Abdelhalim & Samhan, 2021). Sports science meta-analyses confirm that pressotherapy reduces delayed onset muscle soreness and accelerates physical recovery (Maia et al., 2024; Wiśniowski et al., 2022).

Chronic tissue congestion also generates secondary problems, including altered body contours

and chronic tenderness, which further deteriorate psychological status (Alwardat et al., 2019). Cancer-related lymphedema demonstrates that structured support models mitigate these physical and emotional symptoms, yet orthopedic recovery plans rarely deploy comparable approaches (Bowman, Oberoi, Radke, Francis, & Carlson, 2020; Bowman, Piedalue, Baydoun, & Carlson, 2020; Eaton, Narkthong, & Hulett, 2020). Hardware aesthetics additionally employs microcurrent stimulation to support cellular metabolic activity and hematoma resolution, but academic literature evaluating microcurrent therapy within post-orthopedic soft-tissue rehabilitation is absent.

2.4 The Need for Structured Interdisciplinary Models

The transition from a purely biomedical approach to a patient-centered biopsychosocial model is central to modern surgical care. Providers acknowledge that integrating supportive services raises patient satisfaction and reduces provider burden, although fast-paced clinic environments hinder that integration (Reichman, Briskin, Duarte, Vranceanu, & Grunberg, 2023). Qualitative research describes recovery as a process of adapting to a new normal, requiring emotional support and adequate information alongside physical therapy (Norris, Graham, Wilkinson, Savory, & Robinson, 2023; Sleney et al., 2014).

Care models that actively promote psychosocial resiliency have been advocated for orthopedic practice (Zale, Ring, & Vranceanu, 2018). Cancer survivorship offers a working precedent, where comprehensive supportive care addresses fatigue and body image within a single pathway (Alfano & Rowland, 2006). Interdisciplinary pathways that allow non-medical wellness practitioners to manage aesthetic and soft-tissue comfort could therefore close the current gap in postoperative care.

Synthesis of this literature exposes a disconnect between the documented psychological burden of physical trauma and the practical solutions offered in standard orthopedic rehabilitation. Persistent edema, pain, and altered body image are well documented as negative influences on recovery. Pneumatic compression and psychosocial support are well documented as effective. The two bodies of evidence remain fragmented. Clinical studies isolate mechanical recovery from aesthetic comfort, leaving medically discharged patients to manage soft-tissue distress independently. The absence of research on microcurrent stimulation for postoperative hematoma resolution in orthopedics compounds that fragmentation. The proposed framework addresses this systemic blind spot by importing established hardware aesthetic protocols into the postoperative timeline, synthesizing existing concepts rather than contesting them.

Institutionalizing that synthesis requires rigid non-medical boundaries, which the matrix below delineates across three operational parameters. The first parameter is the primary goal: Track A concentrates on joint restoration and structural bone healing, whereas Track B targets aesthetic soft-tissue recovery and stress relief. The second parameter is the instrument set: surgery, pharmacology, and active physical therapy on the clinical side, contrasted with adaptive pressotherapy, microcurrents, and cosmetic wraps on the supportive side. The third parameter is the success metric: objective indicators such as radiographs, laboratory tests, and range-of-

motion degrees for the medical track, against Patient-Reported Outcome Measures and subjective swelling reduction for the wellness track. The comparison demonstrates that aesthetic intervention functions as a complementary, non-overlapping component of the recovery ecosystem.

Table 1: Differentiation of Care Boundaries

Parameter	Track A: Medical Treatment	Track B: Wellness Support
Primary goal	Joint restoration and bone healing	Aesthetic soft-tissue recovery
Primary tools	Surgery, medication, physical therapy	Adaptive pressotherapy, microcurrents
Outcome metric	Radiographs, laboratory tests, range of motion	Patient-reported comfort (PROMs)

Each row of the matrix isolates one axis along which the two tracks could otherwise collide. Reading the table by column returns the job description of each professional; reading it by row returns the decision rule that keeps referral safe. No cell in Track B contains a diagnostic, pharmacological, or surgical action.

3. METHODOLOGY

3.1 Core Principles of Interdisciplinary Aesthetic Support

The framework operates on a strict division of responsibilities between clinical professionals and aesthetic practitioners. Medical rehabilitation, directed by orthopedic surgeons and physical therapists, addresses clinical outcomes such as bone healing, joint stability, and restoration of biomechanical function (Ibrahim, Khan, Nizam, & Haddad, 2013). Aesthetic support targets the superficial soft tissues to relieve visible physical distress and improve the subjective recovery experience.

This division sets the safety standard. Aesthetic interventions are categorized as wellness-oriented support rather than medical treatment. Practitioners do not diagnose conditions, alter prescriptions, or manipulate the surgical site. They manage the secondary aesthetic consequences of surgery, principally widespread bruising and fluid retention. Defined boundaries allow the model to answer demand for recovery pathways that address both the physical and the emotional aftermath of major surgery (Sleney et al., 2014; Szeverenyi et al., 2018; Vincent, Horodyski, Vincent, Brisbane, & Sadasivan, 2015). The approach bridges the interval between hospital discharge and full social reintegration, and it supports a more resilient psychological state (Zale, Ring, & Vranceanu, 2018).

3.2 Modality One: Adaptive Pressotherapy

The first component is adaptive pressotherapy, also termed intermittent pneumatic compression. The procedure uses a suit with multiple overlapping air chambers. The device delivers controlled, wave-like pressure moving from the distal extremities toward the center of the body.

Mechanical compression stimulates the lymphatic system and assists venous return. Major surgical interventions disrupt local fluid dynamics, causing blood and lymph to pool in the superficial tissues. By mimicking muscle pump action, pressotherapy accelerates clearance of that stagnant fluid. Pneumatic compression manages persistent edema safely and effectively across medical and aesthetic disciplines (Abdelhalim & Samhan, 2021; Chang & Cormier, 2013; Pandey et al., 2025; Rogan et al., 2016).

Rhythmic pressure also exerts a calming effect. Wave-like mechanical stimulation activates the parasympathetic nervous system, lowering stress hormone levels, reducing muscle tension, and improving sleep quality. This dual action of drainage and relaxation makes pressotherapy suitable for patients with postoperative anxiety and delayed muscle soreness (Gennarelli, Brown, & Mulcahey, 2020; Maia et al., 2024; Wiśniowski et al., 2022).

3.3 Modality Two: Microcurrent Stimulation

The second modality applies low-level electrical currents in the range of 10 to 600 microamperes. These impulses approximate the natural bioelectrical frequencies of the body, which keeps the treatment painless and non-invasive.

Manual therapies often fail to provide immediate relief for severe tissue congestion (Majewski-Schrage & Snyder, 2016; Torres, Ribeiro, Duarte, & Cabri, 2012). Microcurrent stimulation operates at the cellular level instead. The impulses have been hypothesized to support cellular metabolic activity, including processes related to adenosine triphosphate synthesis, and within postoperative care this mechanism is used to support the resolution of hematomas.

Microcurrents improve local capillary circulation without producing active muscle contraction. Increased blood flow assists clearance of the accumulated blood cells that form visible bruises. Restoring normal skin appearance and reducing the sensation of tissue tightness acts directly on body image and on the social isolation associated with visible surgical recovery.

3.4 Staged Integration Protocol

Clinical safety depends on a strictly staged integration protocol. Introduction of hardware aesthetics must align with the natural phases of tissue healing and with the guidelines issued by the referring orthopedic surgeon.

The early postoperative phase, beginning on the second day after surgery, introduces low-pressure pressotherapy. The objective at this stage is systemic lymphatic support rather than aggressive localized treatment. Early intervention limits severe fluid accumulation and mitigates the psychological effects of prolonged bed rest (Dietrich & Zubler, 2025; Schemitsch & Nauth, 2020). Microcurrent therapy may also begin in this window to target peripheral bruising, provided practitioners maintain a safe distance from active surgical incisions.

The intermediate recovery phase begins around the eighth day. Once acute inflammation subsides, wellness-oriented cosmetic applications such as cooling or detoxifying body wraps join the hardware procedures. Progressive sequencing keeps aesthetic support continuous and structured without disrupting the primary medical treatment plan. Phased models of this type are prerequisites for collaboration between healthcare providers and wellness specialists (Bowman, Oberoi, Radke, Francis, & Carlson, 2020; Bowman, Piedalue, Baydoun, & Carlson, 2020).

The timeline below structures the chronological sequencing and operational windows of these modalities across the first two weeks of recovery (Fig. 2). Day 0 anchors the major surgical intervention, and all subsequent supportive measures are indexed to it. Day 2 marks the introduction of low-pressure pressotherapy calibrated for systemic lymphatic drainage and parasympathetic stimulation. A dedicated therapeutic segment spanning Day 3 to Day 5 covers the initiation of microcurrent therapy directed at peripheral hematomas while avoiding the surgical incision. Day 8 and beyond define the transition into advanced wellness integration, where hardware protocols are supplemented with cooling and detoxifying wraps. Presenting the protocol as a timeline rather than a list is deliberate, since the safety of each modality is a function of elapsed healing time rather than of the modality itself.

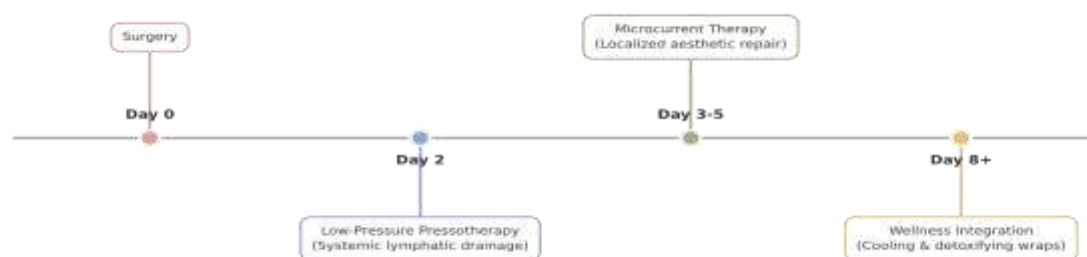


Figure 2: The Staged Aesthetic Support Protocol

4. RESULTS

4.1 Case Description

An observational clinical case based on interdisciplinary referral demonstrates the practical application of the framework. The subject was a 63-year-old female patient who underwent total left hip arthroplasty for stage III bilateral coxarthrosis. Comorbidities included arterial hypertension, osteoporosis, and compensated varicose veins of the lower extremities.

After discharge the patient developed expected but severe complications in the superficial soft tissues: significant edema extending across the thigh and lower leg, extensive hematomas, and pronounced tissue stiffness. Psychological distress accompanied the physical symptoms. The patient reported high anxiety, negative perception of her altered body image, and disrupted sleep caused by a constant sensation of heaviness in the leg. Such combinations of physical and

emotional burden are common after major joint surgery and reduce motivation to participate in active physical therapy (Daley, Griffith, Christino, & Milewski, 2021; Erwin, Ray, & Han, 2023). Because standard rehabilitation concentrated on joint mechanics, the patient was referred to an aesthetic practitioner for non-invasive management of superficial tissue discomfort.

4.2 Application of the Supportive Protocol

The aesthetic practitioner implemented the staged recovery protocol in coordination with the orthopedic surgeon. The intervention was designed to support the lymphatic and vascular systems without contact with the surgical site or interference with bone healing.

Supportive care began on the second postoperative day with adaptive pressotherapy. The patient received 30-minute sessions three times per week, with equipment set to a low-pressure systemic lymphatic drainage mode. The goal at this stage was to stimulate fluid movement and prevent accumulation of stagnant lymph in the lower extremities.

Microcurrent stimulation ran concurrently. Sessions also lasted 30 minutes and were conducted three times per week for a total of ten sessions. Microcurrents were applied across the lower body while strictly bypassing the incision area, with the aim of improving local capillary blood flow and accelerating the cellular repair required to clear visible hematomas.

From the eighth postoperative day the protocol expanded to include cosmetic wrap applications lasting 40 to 50 minutes, performed twice per week. The practitioner used a sequenced botanical approach. Cooling lotions were applied during the first week of wraps to soothe the tissues and stimulate venous return. Formulas in subsequent weeks incorporated marine algae, rose extracts, and bitter orange to support tissue detoxification and skin firming. The patient additionally applied a vein-supporting gel at home to maintain results between clinic visits.

4.3 Patient-Reported Outcome Measures

Patient-Reported Outcome Measures collected over a five-week period served as the evaluation instrument. The assessment focused entirely on qualitative, subjective feedback regarding comfort and wellness.

By the end of the five-week course the patient reported a notable reduction in heaviness and tightness in the thigh and lower leg. Visible hematomas resolved faster than the timelines typically observed in standard recovery, which improved reported body image satisfaction. The rhythmic character of the pressotherapy sessions calmed the nervous system. Sleep quality returned to the baseline level reported by the patient, and anxiety decreased substantially.

This reduction in psychosocial stress and physical discomfort produced a secondary clinical benefit. Feeling lighter and more confident in her appearance, the patient demonstrated higher motivation and compliance during prescribed physical therapy. The outcome aligns with research indicating that attention to psychosocial and superficial physical comfort improves overall rehabilitation success (Norris, Graham, Wilkinson, Savory, & Robinson, 2023; Zale, Ring, & Vranceanu, 2018). The case supports the conclusion that structured aesthetic support

is a safe and potentially beneficial complement to orthopedic care.

The radar chart below contrasts subjective well-being across four analytical axes at two temporal milestones, Day 1 before the introduction of the supportive framework and Week 5 upon completion of the protocol (Fig. 3). Each domain is scored on a survey scale from 1 to 10: sleep quality, covering nighttime comfort and rest; perceived soft-tissue comfort, covering mitigation of lower-limb heaviness and tightness; aesthetic satisfaction, covering resolution of visible swelling and hematomas; and psychological well-being, covering anxiety reduction and mood. The Day 1 polygon is constricted near the origin, reflecting low scores across all dimensions during early postoperative stress. The Week 5 envelope expands toward the outer boundaries. Plotting the two states on shared axes shows that the improvement is distributed rather than concentrated in one domain, which is the central claim of the framework.

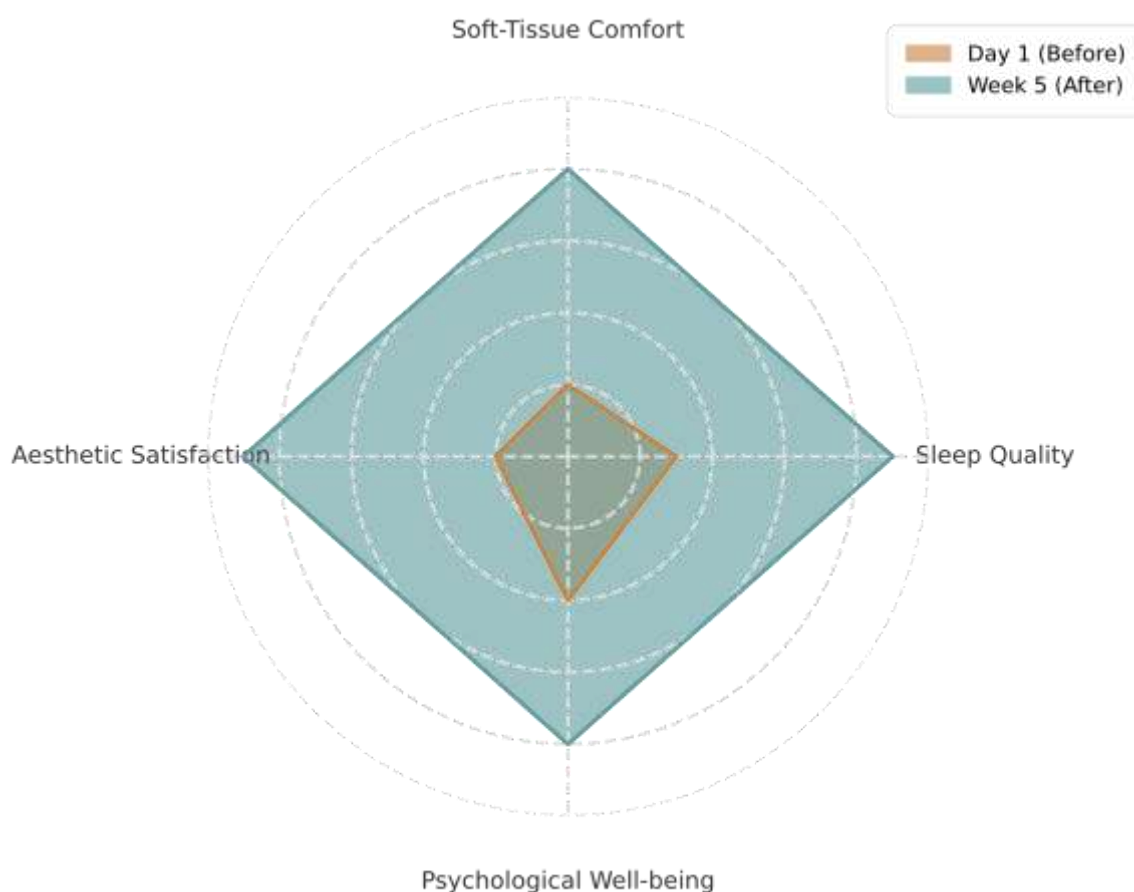


Figure 3: Patient-Reported Outcome Measures (PROMs)

5. DISCUSSION

5.1 The Value of the Interdisciplinary Ecosystem

Findings from the observational case align with the consensus that postoperative recovery requires more than mechanical joint restoration. Orthopedic trauma and subsequent major surgery impose a substantial psychological and physical burden. Patients contend with the

visual impact of severe bruising and the discomfort of swollen superficial tissues. Clinical environments ensure bone healing and joint stability effectively, yet they lack the time and resources to address these secondary challenges (Reichman, Briskin, Duarte, Vranceanu, & Grunberg, 2023). Placing an aesthetic practitioner inside the recovery timeline supplies a structured response to that constraint.

The aesthetic professional acts as a supportive partner rather than a primary healthcare provider. This distinction underpins the collaboration. In the observed case, adaptive pressotherapy and microcurrent stimulation targeted soft-tissue discomfort without altering the surgeon's treatment plan. Faster resolution of hematomas and reduced tissue heaviness improved reported body image. Physical relief translated into psychological benefit through lower anxiety and restored sleep. These subjective improvements matter because a positive mental state increases motivation to adhere to demanding physical therapy routines (Daley, Griffith, Christino, & Milewski, 2021; Erwin, Ray, & Han, 2023). Structured aesthetic support therefore advances the core goals of the biopsychosocial model of care (Zale, Ring, & Vranceanu, 2018).

5.2 Safety and Feasibility

Implementation requires strict safety guidelines and clear communication between medical clinics and aesthetic centers. The primary concern in any postoperative setting is protection of the surgical site from infection and mechanical disruption. The framework consequently mandates that aesthetic interventions avoid direct contact with incisions. Microcurrent applications and wellness wraps address only peripheral areas affected by secondary swelling and bruising.

Timing must follow the natural phases of tissue healing. Early initiation of low-pressure pneumatic compression is safe and effective for systemic fluid management, mirroring protocols used in chronic lymphedema care and sports recovery (Chang & Cormier, 2013; Pandey et al., 2025; Wiśniowski et al., 2022). Aesthetic practitioners operate exclusively under the guidance or referral of the primary physician. They do not diagnose complications, interpret medical imaging, or prescribe medication. Their role is limited to wellness-oriented comfort and superficial tissue recovery.

Firm professional boundaries make the framework feasible in real-world settings. Aesthetic centers gain a structured method for extending services into postoperative wellness support. Orthopedic surgeons gain a reliable referral option for patients who need additional help managing the physical and emotional discomfort of soft-tissue trauma. The collaboration optimizes the recovery pathway so that patients receive care addressing both medical necessities and quality-of-life expectations.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The study set out to design and evaluate a structured interdisciplinary model integrating non-invasive hardware aesthetics into post-orthopedic recovery. The framework established operational boundaries between clinical rehabilitation, managed by physicians, and wellness-oriented support, provided by aesthetic practitioners. Adaptive pressotherapy and microcurrent stimulation targeted the secondary superficial complications of major surgery: extensive edema, hematomas, and tissue stiffness. Qualitative patient-reported feedback indicated an improved recovery experience. Targeted application of the two modalities accelerated the aesthetic resolution of soft-tissue trauma without contact with the surgical site. The patient reported a rapid decrease in perceived tissue heaviness and an improvement in body image. The soothing mechanical character of the treatments reduced psychological distress, restoring sleep quality and lowering postoperative anxiety. Supportive aesthetic interventions therefore offer more than cosmetic benefit. They deliver psychosocial and physical relief that supports compliance with traditional medical rehabilitation (Norris, Graham, Wilkinson, Savory, & Robinson, 2023; Zale, Ring, & Vranceanu, 2018).

6.2 Recommendations

Based on the observed outcomes, the study recommends a broader shift in both orthopedic care and aesthetic cosmetology. Healthcare systems struggle to deliver comprehensive psychosocial and physical comfort services under time constraints and fast clinic throughput (Reichman, Briskin, Duarte, Vranceanu, & Grunberg, 2023). The aesthetic industry, for its part, must extend beyond standard salon services toward wellness-oriented recovery pathways. Future research should extend the conceptual model to other surgical disciplines and test it against controlled comparison groups. Standardized educational programs for aesthetic practitioners are equally necessary. Such programs would train professionals to navigate the postoperative environment safely, with working knowledge of the physiological stages of tissue healing and of the boundaries of non-medical support. Formalizing this interdisciplinary collaboration would allow the medical and aesthetic communities to build a patient-centered ecosystem covering the full spectrum of recovery needs (Alfano & Rowland, 2006; Bowman, Oberoi, Radke, Francis, & Carlson, 2020).

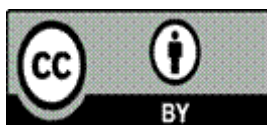
REFERENCES

- Aasvang, E., Luna, I. E., & Kehlet, H. (2015). Challenges in postdischarge function and recovery: The case of fast-track hip and knee arthroplasty. *British Journal of Anaesthesia*. <https://doi.org/10.1097/01.sa.0000484605.57926.b9>
- Abdelhalim, N. M., & Samhan, A. (2021). Influences of intermittent pneumatic compression therapy on edema and postoperative patient's satisfaction after lipoabdominoplasty. *Aesthetic Plastic Surgery*. <https://doi.org/10.1007/s00266-021-02272-w>

- Alfano, C., & Rowland, J. (2006). Recovery issues in cancer survivorship: A new challenge for supportive care. *Cancer Journal*. <https://journals.lww.com/journalppo/toc/2006/09000>
- Alwardat, N., di Renzo, L., Alwardat, M., Romano, L., De Santis, G. L., Gualtieri, P., Carrano, E., Nocerino, P., & De Lorenzo, A. (2019). The effect of lipedema on health-related quality of life and psychological status: A narrative review of the literature. *Eating and Weight Disorders*. <https://doi.org/10.1007/s40519-019-00703-x>
- Attoe, C., & Pounds-Cornish, E. (2015). Psychosocial adjustment following burns: An integrative literature review. *Burns*. <https://doi.org/10.1016/j.burns.2015.02.020>
- Bowman, C., Oberoi, D., Radke, L., Francis, G., & Carlson, L. (2020). Living with leg lymphedema: Developing a novel model of quality lymphedema care for cancer survivors. *Journal of Cancer Survivorship*. <https://doi.org/10.1007/s11764-020-00919-2>
- Bowman, C., Piedalue, K., Baydoun, M., & Carlson, L. (2020). The quality of life and psychosocial implications of cancer-related lower-extremity lymphedema: A systematic review of the literature. *Journal of Clinical Medicine*. <https://doi.org/10.3390/jcm9103200>
- Chang, C. J., & Cormier, J. (2013). Lymphedema interventions: Exercise, surgery, and compression devices. *Seminars in Oncology Nursing*. <https://doi.org/10.1016/j.soncn.2012.11.005>
- Daley, M. M., Griffith, K., Christino, M., & Milewski, M. D. (2021). The mental side of the injured athlete. *Journal of the American Academy of Orthopaedic Surgeons*. <https://doi.org/10.5435/JAAOS-D-20-00974>
- Dietrich, L., & Zubler, C. (2025). Physical and psychological burden of bed rest on patients following free flap reconstruction of the lower limb: A systematic review and possible solutions. *Journal of Clinical Medicine*. <https://doi.org/10.3390/jcm14030705>
- Eaton, L., Narkthong, N., & Hulett, J. M. (2020). Psychosocial issues associated with breast cancer-related lymphedema: A literature review. *Current Breast Cancer Reports*. <https://doi.org/10.1007/s12609-020-00376-x>
- Erwin, E. R., Ray, K. S., & Han, S. (2023). The hidden impact of orthopedic surgeries: Examining the psychological consequences. *Journal of Clinical Orthopaedics and Trauma*. <https://doi.org/10.1016/j.jcot.2023.102313>
- Gennarelli, S. M., Brown, S. M., & Mulcahey, M. (2020). Psychosocial interventions help facilitate recovery following musculoskeletal sports injuries: A systematic review. *Physician and Sportsmedicine*. <https://doi.org/10.1080/00913847.2020.1744486>
- Ibrahim, M., Khan, M. A., Nizam, I., & Haddad, F. (2013). Peri-operative interventions producing better functional outcomes and enhanced recovery following total hip and

- knee arthroplasty: An evidence-based review. *BMC Medicine*.
<https://doi.org/10.1186/1741-7015-11-37>
- Klein, I., Tidhar, D., & Kalichman, L. (2020). Lymphatic treatments after orthopedic surgery or injury: A systematic review. *Journal of Bodywork and Movement Therapies*.
<https://doi.org/10.1016/j.jbmt.2020.06.034>
- Maia, F., Nakamura, F., Sarmiento, H., Marcelino, R., & Ribeiro, J. (2024). Effects of lower-limb intermittent pneumatic compression on sports recovery: A systematic review and meta-analysis. *Biology of Sport*. <https://doi.org/10.5114/biolsport.2024.133665>
- Majewski-Schrage, T. L., & Snyder, K. R. (2016). The effectiveness of manual lymphatic drainage in patients with orthopedic injuries. *Journal of Sport Rehabilitation*.
<https://doi.org/10.1123/jsr.2014-0222>
- Norris, S., Graham, L., Wilkinson, L., Savory, S., & Robinson, L. (2023). Patient perspectives of recovery following major musculoskeletal trauma: A systematic review and qualitative synthesis. *Trauma*. <https://doi.org/10.1177/14604086231211995>
- Obey, M. R., & Miller, A. N. (2022). Resources for patient mental health and well-being after orthopaedic trauma. *Journal of Orthopaedics and Trauma*.
<https://doi.org/10.1097/BOT.0000000000002445>
- Pandy, S. K., Ozmen, B., Morkuzu, S., Xiong, Y., Kemp, E., & Chen, W. F. (2025). Current role of pneumatic compression therapy in lymphedema care: A scoping review of persistent debates and new applications. *Lymphology*.
<https://doi.org/10.2458/lymph.7497>
- Reichman, M., Briskin, E. A., Duarte, B. A., Vranceanu, A., & Grunberg, V. A. (2023). Integrating psychosocial care into orthopedic settings: A qualitative study of provider perspectives. *International Journal of Integrated Care*.
<https://doi.org/10.5334/ijic.7579>
- Rogan, S., Taeymans, J., Luginbuehl, H., Aebi, M., Mahnig, S., & Gebruers, N. (2016). Therapy modalities to reduce lymphoedema in female breast cancer patients: A systematic review and meta-analysis. *Breast Cancer Research and Treatment*.
<https://doi.org/10.1007/s10549-016-3919-4>
- Schemitsch, C., & Nauth, A. (2020). Psychological factors and recovery from trauma. *Injury*.
<https://doi.org/10.1016/j.injury.2019.10.081>
- Sleney, J., Christie, N., Earthy, S., Lyons, R., Kendrick, D., & Towner, E. (2014). Improving recovery: Learning from patients' experiences after injury: A qualitative study. *Injury*.
<https://doi.org/10.1016/j.injury.2012.12.025>
- Szeverenyi, C., Kekecs, Z., Johnson, A. J., Elkins, G., Csernátöny, Z., & Varga, K. (2018). The use of adjunct psychosocial interventions can decrease postoperative pain and improve

- the quality of clinical care in orthopedic surgery: A systematic review and meta-analysis of randomized controlled trials. *Journal of Pain*. <https://doi.org/10.1016/j.jpain.2018.05.006>
- Torres, R., Ribeiro, F., Duarte, J. A., & Cabri, J. (2012). Evidence of the physiotherapeutic interventions used currently after exercise-induced muscle damage: Systematic review and meta-analysis. *Physical Therapy in Sport*. <https://doi.org/10.1016/j.ptsp.2011.07.005>
- Upton, D., Stephens, D., & Andrews, A. (2013). Patients' experiences of negative pressure wound therapy for the treatment of wounds: A review. *Journal of Wound Care*. <https://doi.org/10.12968/jowc.2013.22.1.34>
- Vincent, H., Horodyski, M., Vincent, K., Brisbane, S., & Sadasivan, K. (2015). Psychological distress after orthopedic trauma: Prevalence in patients and implications for rehabilitation. *PM & R: The Journal of Injury, Function, and Rehabilitation*. <https://doi.org/10.1016/j.pmrj.2015.03.007>
- Wiśniowski, P., Cieśliński, M., Jarocka, M., Kasiak, P., Makaruk, B., Pawliczek, W., & Wiecha, S. (2022). The effect of pressotherapy on performance and recovery in the management of delayed onset muscle soreness: A systematic review and meta-analysis. *Journal of Clinical Medicine*. <https://doi.org/10.3390/jcm11082077>
- Zale, E. L., Ring, D., & Vranceanu, A. (2018). The future of orthopaedic care: Promoting psychosocial resiliency in orthopaedic surgical practices. *Journal of Bone and Joint Surgery. American Volume*. <https://doi.org/10.2106/JBJS.17.01159>



2026 by the Authors. This Article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>)