

Supplementary Material S3: PICO Framework

Table S3. PICO framework used to define the review question.

Component	Description
Population (P)	• Patients clinically diagnosed with post-acne atrophic scars. • Any age, sex, ethnicity, scar severity, or scar duration. All Fitzpatrick skin types.
Intervention (I)	• Topical insulin therapy (monotherapy or adjunctive therapy). • Combined with procedural modalities such as: Microneedling (MN), Fractional CO₂ laser (FCL), and others.
Comparison (C)	• Placebo • Microneedling alone • Alternative topical agents (e.g., hyaluronic acid, vitamin C, timolol) • Other procedural comparators (e.g., MN + PRP, laser alone)
Outcomes (O)	Primary outcome: • Objective scar improvement using validated physician-reported scales. Secondary outcomes: • Patient-reported satisfaction, scar-type specific response (ice pick, boxcar, rolling), skin-type specific outcomes (Fitzpatrick classification). • Safety outcomes: Frequency and type of adverse events (erythema, pain, edema, PIH, infection, hypoglycemia)
Study design and other criteria (S)	• Randomized or non-randomized comparative studies with a control or comparator group. • Reporting at least one of the outcomes listed above. • English-language full-text reports. • Eligibility did not depend on the direction, magnitude, or statistical significance of study results.

Footnote: PICO framework used to determine target population, selected intervention, comparison groups, and possible outcomes.