20 Maximizing Safety with Cryolipolysis
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Abstract
Cryolipolysis is among the most popular noninvasive treatments for focal adipose excess. The FDA cleared cryolipolysis for reduction of fat deposits in the flanks, abdomen, and thighs between 2010 and 2014; this technology has since emerged as a leader among noninvasive body contouring devices. Cryolipolysis works by preferentially destroying fat cells through a controlled thermal reduction. Exposure to below normal, but above-freezing temperature induces apoptosis of fat cells and takes advantage of adipocyte sensitivity to the cooling process when compared to surrounding tissues.

Keywords: cryolipolysis, noninvasive body contouring, adipocyte apoptosis, lipodystrophy

Key Points
- Cryolipolysis is based on the concept that lipid-rich tissues are more susceptible to cold injury than surrounding water-rich tissue (Fig. 20.1).1,2,3,4
- The method involves controlled application of cooling within the temperature range of -11 to 5°C.1,5,6
- Cryolipolysis targets adipocytes while sparing skin, nerves, vessels, and muscles.7
- This technology appears to be safe in the short and long term. It has not been shown to have any effect on cholesterol, triglycerides, low-density lipoprotein, high-density lipoprotein, liver function (aspartate aminotransferase (AST)/alanine aminotransferase (ALT) bilirubin), albumin, or glucose.7
- The mechanism for cryolipolysis is not fully understood. Theories include adipocyte apoptosis by cellular edema, reduced Na-K-ATPase activity, elevated lactic acid levels, and mitochondrial free radical release. Ultimately, an inflammatory process leads to adipocyte death and removal by macrophages within 3 months.8
- Complications are rare and typically resolve a few weeks after treatment. Adverse events include erythema, bruising, swelling, sensitivity, and pain. No persistent ulcerations, scarring, paresthesias, hematomas, blistering, bleeding, hyperpigmentation/hypopigmentation, or infections have been described.8,9,10
- Few isolated case reports have described paradoxical adipose hyperplasia after cryolipolysis treatment (est 1:20,000).11,12,13,14,15

20.1 Safety Considerations
- Ideal candidates are patients who require small focal areas of adipose tissue removal. Patients with excess adipose tissue or skin must be appropriately counselled, as they are likely better candidates for liposuction or excisional operations.
- Contraindications to cryolipolysis include cold-induced conditions such as cryoglobulinemia, cold urticarial, and paroxysmal cold hemoglobinuria.8,16
- Cryolipolysis should not be performed in treatment areas with severe varicose veins, dermatitis, or other cutaneous lesions.8,16
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Fig. 20.1 Effect of cryolipolysis on adipose tissue.

Procedure day

Apply cold treatment

Dermis

Fat cells

Following the procedure

Fat cells exposed to cold treatment begin to crystallize

2-3 months after the procedure

Fat cells continue to break down and are removed from the body

3-6 months after the procedure

A change in contour upon removal of fat cells
20.2 Clinical Correlations

- Cryolipolysis has been shown to safely and effectively reduce subcutaneous fat and has FDA clearance for treatment of the flanks, abdomen, thighs, submental area, back, bra area, underneath the buttocks, and the arm.
- Treatment protocols have yet to be optimized to maximize results. Patients should be notified that multiple treatments are often required for the desired effect.
- Subsequent treatments lead to further fat reduction; however, the extent of improvement has not been shown to be as dramatic as the first treatment. There are also variations to the degree of improvement with additional treatments based on the anatomic site (i.e., subsequent treatments of the abdomen have more marked results when compared to the flanks).
- Massage/kneading of the soft tissues posttreatment has been shown to improve the efficacy of cryolipolysis clinically and histologically.

References