**Introduction:** In 2014, 21.4 million cosmetic and reconstructive autologous fat grafting (AFG) procedures were performed.[1] While there may be increasing evidence suggesting the safety and effectiveness of AFG in breast-related procedures, little is known regarding the efficiency of such procedures. This study summarizes the literature assessing these outcomes, with a focus on efficiency.

**Methods:** A systematic literature review of fat grafting procedures using PubMed from April 1, 2010 to April 30, 2015 was conducted assessing safety, effectiveness and efficiency outcomes of AFG procedures. Patient demographics, surgical characteristics, and outcomes related to safety, effectiveness, and efficiency were evaluated. Descriptive statistics including mean, median, ranges and percentages were derived from these studies.

**Results**: A total of 598 articles were assessed. Sixty-five studies were included: 36 for breast applications (BA), 20 for facial applications (FA), and 9 for other applications (OA) (buttocks/arms/hands). Safety (i.e., fat necrosis, infection) and effectiveness (i.e., fat retention, satisfaction) outcomes were found to be similar to prior reviews as well as across other applications. Although no studies reported the mean volume of fat processed, multiple studies reported the mean volume of fat harvested: BA, 503 ml (range: 12-1,299); FA, 152.7 ml (range: 35-360), and OA 1753.8 ml, which was specific to the buttocks. Most BA studies reported the mean volume of fat re-injected (mean across studies = 145 mL; range: 20-607). Mean OR time was 125 min (range: 40-210) for BA; sufficient OR data was not available for FA and OA.

**Conclusions:** This review validated previous findings on the safety and effectiveness of AFG, highlighted new efficiency data, and identified gaps and variability in how efficiency was evaluated. The limited published data helps to frame the challenge and need for the ASPS effort to collect and standardize data by using the GRAFT registry. Additionally, when combined with more recent literature communicating efficiency as a rate (cc/min), uniformity of reporting across the harvesting, processing, and injection steps of AFG is encouraged in order to allow for comparisons across studies and among new technologies that may have the potential to reduce time and thus produce cost-savings while not sacrificing safety and effectiveness.

**Reference Citations:**

1. 2014 Plastic Surgery Statistics Report. *American Society of Plastic Surgery.* 2014