Background: Autologous fat grafting is an increasingly popular procedure used for facial rejuvenation and body contouring. Fat grafting has been criticized for having inconsistent graft survival and seemingly surgeon-dependent outcomes. The purpose of this abstract is to perform an evidence-based review to determine fact from fiction for the hot topics in autologous fat grafting.

Methods: A comprehensive literature search was performed using the following databases: the Cochrane Central Registrar of Controlled Trials (CEN-TRAL), Ovid MEDLINE, Ovid EMBASE , Ovid CINAHL and Google Scholar. The following key words were then searched: “fat grafting”, “autologous fat grafting”, “autologous fat transfer.” We then assessed each modality individually, from relevant articles, for the level of evidence that exists and whether the majority of evidence supports or refutes it.

Results: A review of the literature demonstrated there is no standard test for determining fat viability or volume augmentation after grafting. Furthermore, there is no difference in cell viability seen between syringe aspiration and liposuction pump aspiration harvest techniques (Level II). The decision to wash or centrifuge the fat plays very little role in fat graft survival (Level III). There is no difference between cell viability as a function of harvest location (Level IV). Nearly all studies show no significant effect of local anesthesia on adipocyte cells (Level IV). There is excellent data that supports the fact that low-shear devices maintain fat structural integrity (Level IV). There is quality evidence that support longevity of fat grafted to the breast (Level II/III). Multiple studies support that large volume fat grafting maintains it longevity (Level III). External pre-expansion devices improves total graft survival rate (Level IV). There is quality evidence to support that fat should be injected soon after harvesting, as properties of fat begin to change after processing (Level IV). Micro needling (pre-conditioning) prior to fat grafting has been demonstrated to improve fat survival (Level III).

Conclusion: Currently the highest levels of evidence derive from human studies of clinical trials and animal studies using human fat. The evidence presented here helps to address the need for accurate and quantitative viability assays. These assays would facilitate a systematic evaluation of each procedural step during fat graft harvest, processing, and grafting in order to improve the overall viability and predictability of fat grafts.