Introduction: The hair transplant process combines a variety of repetitive skills. Mastering these skills allows the operators to craft growing hair that mimics lost hair while minimizing alterations in the surface and histological anatomy of the scalp. Creating perfectly sized and angled recipient sites and precise, differential (graded) graft placement are critical, rate limiting steps in the hair transplant process.

Premise: Perfectly sized and angled incisions into which graded grafts can be precisely placed are critical and often overlooked when evaluating the outcome of the modern hair transplant process.

Discussion: The hair transplant process consists of graft harvesting, strip dissection, recipient site creation, and graft placement. Recent advances in strip harvesting (single bladed scalpel, superficial incisions, blunt dissection) have reduced follicular destruction prior to graft placement. Motorized FUE devices have decreased graft damage and transection rate. Magnification has reduced graft damage during strip dissection while advanced microscopy has rendered graft dissection easily taught and learned. While follicles can be destroyed and/or damaged prior to placement, the follicular attrition rate prior to graft placement has been reduced to 5% or less in experienced hands. Placers receive grafts in relatively good condition. Even if grafts are of variable size or quality, skilled, differential placing can make up for mediocre or poor dissection as long as the actual follicles from dermal papilla to the supra bulge area are intact prior to placement. To make transplants natural and undetectable it is important to place grafts so that when healed the scalp isn't altered. Limiting the depth of incisions is important. Most grafts are 4mm in length but there are slight variations. Incisions made too deep causes unnecessary damage, pain, and bleeding Grafts placed too deeply in incisions made too deep can cause the scalp surface can become pitted after healing, a noticeable scalp surface alteration. Grafts placed too deeply can also cause inclusion cysts in addition to pitting. Grafts placed too shallow can cause the dermal papilla to be compressed and damaged, compromising growth. If grafts are placed too shallow and their epidermis is left above the skin, an elevation or bump can be seen at each graft. Generally follicle length is consistent in each patient so once the depth is set, it remains constant for all grafts. Each time a blade is changed, the depth must be reset. One, two, and three to four hair grafts increase in volume. For perfect fit, the width of incisions for these respective grafts sizes should vary, matching the volume of each graft size. One size does not fit all. A few trial incisions for each graft size should be made and grafts inserted to test graft size and spacing. Incisions placed to close can lead to popping during placement which can decrease yield. Incisions made too narrow can lead to follicle damage during placing and compression of multihair grafts during growth, visible as over dense areas. Incisions made too wide can cause grafts to spontaneously fall out, movement of the graft within the incision, and misangled growth. Relaxation of elastic fibers due to their incision during site creation ideally is equal to and compensates for the volumetric increase caused by adding tissue during graft placement. When grafts too large are placed into incisions made too small, a volumetric expansion of the scalp tissue can occur causing ridging and negative alterations in scalp surface. These abnormalities can be visible, detracting from the natural results of hair transplantation. Hair exit angles vary greatly in different areas of the scalp. The exit area of adjacent hairs can vary. The angle of the

incision ideally should mimic the angle of the growing hair in the area. Attention should be paid to incision angle and resultant hair exit angle. If the area to be incised is devoid of hair, experience or reference should guide the operator with respect to correct incision angles.

Precise placement of grafts is one of the most important, if not the most important, skills to be mastered. Differential, or graded, placement refers to first, grading, or closely examining each graft and each hair in the graft for based on structural integrity of the hair and the chance it will regrow. For example, all two hair grafts are not equal, one of the two hairs may be miniaturized or of questionable structural quality. After grading, the best grafts or ones most likely to have all hairs grow.