INTRODUCTION
While much attention has been focused on developing prosthetic technologies, there has been a lack of objective data on the optimal transection levels for both upper and lower extremity amputations. It is generally hypothesized that preserving as much limb length as possible will result in the highest degree of prosthetic function and patient satisfaction. The purpose of this preliminary study is to investigate the correlation between residual limb length, function, and patient satisfaction.

METHOD
Case studies will be presented that exemplify the challenges faced by individuals with long residual limbs. The cases will reflect upper and lower prosthetic users from clinical practice. Each case will provide a brief history identifying the user’s transectional level, the functional benefits and limitations of each level, and the users’ descriptions of their satisfaction with their activities of daily living.

RESULTS
Excessive residual limb length is defined in this study as a transected limb length that inhibits or limits optimal function, comfort, cosmesis, and/or patient satisfaction. Optimal limb length may vary from case to case. It is proposed in this study that an optimal length allows adequate lever arm for maximum biomechanical function and yet allows enough room for appropriate and beneficial prosthetic technology, as well as adequate cosmetic appeal.

DISCUSSION
Appropriate transectional levels for limb amputation vary according to the source accessed. Historically it has been accepted that it is essential for both lower and upper extremity amputations to maintain the most distal joint possible in order to maximize function. The concept of an excessive residual limb length has been typically a pediatric concern. Osebold, Lester, and Christenson (2001) noticed in their Shiners’ Hospital practice that when disarticulations of the ankle were performed, the length of the residual limb posed significant problems when attempting to fit young developing patients with prosthetic feet.

Even for adults unilateral joint disarticulation amputations have classically been associated with challenges to limb length symmetry. As innovations in prosthetic technology have evolved, prosthetic components have increased in size and occupy more space within the prostheses.

CONCLUSION
Our observations suggest that prosthetic function and patient satisfaction may be negatively impacted by excessively long residual limbs. Recent research has indicated that the perceived result of amputation is not necessarily associated with the length of the residual limb but rather with factors that may be optimized by surgical procedures, prosthetic technology, and rehabilitation (Baum, Schnall, Tis, & Lipton, 2008). Further research is needed to consider these issues and to delineate the effects of limb length on prosthetic function and patient satisfaction.

REFERENCES
Baum, B.S., Schnall, B.L., Tis, J. E., Lipton, J.S. Correlation of residual limb length and gait parameters in amputees. Injury, Int. J. Care Injured 2008; 39, 728—733.