INTRODUCTION
Until 2009, the Transfemoral (TF) level amputation was the prevalent major amputation surgery in the United States (Bellati, 2013). Transfemoral prosthetic socket design and construction have a long history in our profession (Gholizadeh, 2014). Yet the profession still lacks clinical standards of practice. A presentation has been created that will review the evolution of TF socket design; discuss current designs being utilized; and summarize the curriculum with applicable outcome measures of TF prosthetics that are being taught at the accredited Masters level orthotic and prosthetic practitioner programs in the United States.

Learning objectives for this presentation include:
- Recall previous TF socket designs;
- Outline the history of TF education;
- Describe the National Commission on Orthotic and Prosthetic Education (NCOPE) current curriculum standards and institutional instruction for TF socket design; and
- Compare and contrast current practical TF socket designs; their biomechanical function, material science, suspension, impression techniques clinical applications and applicable outcome measures.

Background: The first patents awarded for TF prosthetic designs were given in England in 1790 and 1800 with the first U.S. patent for a TF artificial limb given in 1846 (G.E. Marks, 1896,. US Patent # 4834, 1846). In 1949, the first formal TF instructional course began at the University of California Berkeley and consisted of short-term lessons focused on the fabrication and alignment of a transfemoral suction socket design. Then, in the 1950’s, the University of California Los Angeles, New York University and Northwestern University began formal education programs in prosthetics (Anderson 1961). Currently, there are eleven NCOPE accredited education institutions for prosthetics and orthotic practitioner programs. While most schools follow the lecture, demo, then do, clinical model (Plack, 2011), all have differing theories and alter in practical techniques for quadrilateral, Ischial containment and sub-Ishcial socket designs. It is understandable why there are differing socket designs due to the nature of each TF residual limb’s anatomy, limb size and length, so it would be clinically beneficial to understand what socket designs are being implemented in clinical practice and why each institution chooses to teach the style they do.

METHOD

The information gathered for this presentation is cited from US patent searches as well as a literature search using various data bases with terms that included ‘artificial limbs’, ‘above knee’, ‘interface’, ‘sockets’, ‘artificial legs’, ‘transfemoral’, and ‘education’. Current orthotic and prosthetic (O&P) textbooks listed on the American Board for Certification’s (ABC) 2010 Examination Question References and Recommended Reading List where utilized. The 2010 NCOPE Core Curriculum for Orthotists and Prosthetists Guidelines as well as the Practice Analysis of Certified Practitioners in the Disciplines of Orthotics and Prosthetics published by ABC in 2007 are also referenced. Interviews were conducted with current faculty at NCOPE accredited O&P practitioner programs such as: the California State University Dominguez Hills; University of Hartford; Northwestern University Prosthetic-Orthotic Center; St. Petersburg College and the University of Washington. Additional interviews were conducted with the Vice President of Prosthetics and the Director of Clinical Education for Hanger Clinic as well as multiple facility owners and certified practitioners of O&P accredited facilities.

RESULTS AND DISCUSSION

With the information gathered from interviews and literature cited, it is clear that there is no ‘one’ TF socket design that would be appropriate and applicable for every user of TF prosthetics. The prosthetic practitioner requires the ability to differentiate between designs to determine which would be best for their unique patient. Therefore, this presentation has been created to: review the history, contrast the current status of institutional instruction, compare clinical practical use and present the potential future direction of TF socket designs as it relates to the biomechanics of fit, types of suspension, impression technique, and fabrication science. The presentation also covers potential psychosocial and functional outcome measures appropriate for use within TF socket design acceptance.

CONCLUSION
A potential conclusion would be for the newly formed Orthotic Prosthetic Educators Council to discuss the current need for a standardized education platform in TF socket designs that would address the current needs of the profession. It would also be beneficial to create curriculum assessments that better justify the techniques taught at the institutional level so the profession...
has a solid foundation of knowledge to base their clinical decisions on.

**CLINICAL APPLICATIONS**
An overview of differing TF socket designs as they relate to biomechanical fit and function, material science, suspension and impression techniques will increase the audience’s knowledge base in TF practical theory. This will allow the practitioner to be better prepared to make the most appropriate clinical choices for their patients.

**REFERENCES**
Marks, G.E., 1896, *A Treatise On Artificial Limbs With Rubber Hands And Feet*. Marks NY.
Plack M., 2011 *Teaching and Learning in Physical Therapy: From Classroom to Clinic*, Slack NJ.