Compliant Hands: The Next Evolution of the Prosthetic Hand
John M. Miguelez, CP, FAAOP

While the last 10 years have brought significant advancements to the upper extremity prosthetic patient population, the function of prosthetic terminal devices has been limited by their inability to mimic the myriad grasping patterns of the human hand. Recently, several groups have made considerable progress in the development of terminal devices that offer more anatomical articulation while retaining the aesthetics of a human hand. The earliest generation of compliant hands expands function beyond the basic 3-point grip using the 1st, 2nd, and 3rd digits to a grasping capability that utilizes all digits in multiple, user-selected configurations. This technology provides a new level of stability and dexterity when handling asymmetrical objects of various sizes. Later generations of complaint hands envisage independent finger motion with sensory input capacity. The most challenging aspect in the development of an advanced compliant hand is in accessing sufficient data from the residual limb to control the increased degrees of freedom. This presentation will examine the current state of compliant hands and the direction of technological research and development.