

First-ever questionnaire assesses impact of brachial plexus injury and surgical outcomes

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After extensive research, investigators at Hospital for Special Surgery (HSS) have developed the first-ever patient questionnaire to measure the physical and emotional impact of brachial plexus injury (BPI). The survey also seeks to assess patients' expectations and treatment outcomes.

The research and the copyrighted [questionnaire](#) were published in the *Journal of Bone & Joint Surgery* today.

The brachial plexus is a network of nerves that extends from the spinal cord in the neck, under the collarbone and down the arm. These nerves control the shoulder, arm, elbow, wrist and hand. A [brachial plexus injury](#) can be life-altering. People often suffer from severe, unrelenting pain and can lose the use of their arm and hand.

"A brachial plexus [injury](#) has a profound impact on quality of life," said Carol A. Mancuso, MD, a senior scientist at HSS and lead investigator. "Patients are usually young adults who sustained trauma, such as from a motor vehicle accident or sports injury."

Dr. Mancuso and orthopedic surgeons specializing in complex nerve reconstruction surgery for BPI sought to develop a questionnaire to thoroughly understand the injury's impact on patients. "The sudden nature of the injury can lead to a realm of psychological challenges, such as emotional distress, loss of independence, and depression, that can overwhelm patients and potentially hamper recovery," said Dr. Mancuso,

who specializes in developing surveys and questionnaires at HSS. "Capturing these psychological elements is necessary to thoroughly understand disability and recovery from this complex condition."

"The questionnaire is important because it moves beyond the surgeon's interpretation of the outcomes of surgery and gets to the heart of patient needs, expectations, and functional satisfaction," said Scott W. Wolfe, MD, director of the Center for Brachial Plexus and Traumatic Nerve Injury at HSS. "It probes the emotional as well as the physical impact of the injury and realizes data that is not identified in any other outcome measure."

Dr. Mancuso developed the questionnaire based on patient input, with preoperative and postoperative versions. Patients with BPI who were undergoing or had already undergone surgical reconstruction were enrolled during routine office visits at HSS.

The study had three phases. Phase 1 included interviews with patients using open-ended questions addressing the impact of BPI and improvement expected before surgery (preoperative patients) or received (postoperative patients). Phase 2 involved assembling a draft questionnaire and administering it twice to establish test-retest reliability. Phase 3 involved selecting final items, developing a scoring system, and assessing validity. Patient scores using the questionnaire were assessed in comparison with scores of the Disabilities of the Arm, Shoulder and Hand (DASH) and RAND-36 measures.

The HSS preoperative and postoperative surveys both include questions rating the severity of BPI symptoms; assess difficulty with activities of daily living, such as getting dressed; address psychological issues, such as depression; and ask how the injury has affected school or work. The preoperative questionnaire also assesses how much improvement patients expect from treatment, while the postoperative version asks how much

improvement patients believe they received from surgery or another treatment.

Dr. Mancuso noted that the questionnaire has the potential to improve patient care. "First, it provides a template from which patients can discuss the spectrum of physical and emotional effects of BPI with their surgical team. This, in turn, offers providers the opportunity to comprehensively address patients' needs directly or through a referral," she said. "Second, the questionnaire fosters discussion of realistic outcome expectations, which are necessary to maintain motivation and ensure long-term participation in rehabilitation. This also enables patients to make appropriate plans for school or work activities."

"We will be able to tell what matters most to [patients](#) and then see if we achieved their goals," said Steve K. Lee, MD, director of research, Center for Brachial Plexus and Traumatic Nerve Injury. "Other outcomes measurements were not specific enough to this unique, complex patient population."

Dr. Wolfe noted, "The questionnaire will, without a doubt, improve patient care by aligning surgical and treatment alternatives with patient needs and expectations."

In addition, the survey plays a role in assessing outcomes of highly specialized nerve reconstruction surgery to repair brachial plexus injury, according to Dr. Mancuso. "The questionnaire provides a valid and standardized method for clinicians and researchers to document and compare patient-reported outcomes from specific or novel surgical interventions."

More information: Carol A. Mancuso et al, Development of a Questionnaire to Measure Impact and Outcomes of Brachial Plexus Injury, *The Journal of Bone and Joint Surgery* (2018). [DOI:](#)

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