Neonatal brachial plexus palsy (NBPP) is defined as damage to the fetal brachial plexus between C5-T1.1
Nerve damage can range from stretching of the nerve, rupture of the nerve, to complete avulsion of the nerve roots from the spinal cord.1
Neonatal brachial plexus injury results in flaccid paralysis of the effected upper extremity.3
The incidence of NBPP is approximately 1.5/1000 live births. Brachial plexus palsy has good prognosis with early detection and regular therapies.3

OBJECTIVES
The goal of this study is to analyze the variability of non-surgical management of NBPP among major brachial plexus clinics in the US and assess which therapeutic modalities are most commonly used to encourage the standardization of treatment.

METHODS
A cross-sectional study of 23 programs managing NBPP was undertaken. Brachial Plexus Centers were selected from the national Brachial Plexus foundation websites and UBPN.org.
Data collection was done using an online survey instrument of 25 questions regarding functional assessment, biomechanical assessment, diagnostic tools, and non-surgical therapeutic management of NBPP patients.
Response return rate to survey was 100% by 23 NBPP clinics, however response rate to each question was variable.
Results were reviewed to assess diagnostic modalities and common management practices.

RESULTS
There is agreement that goniometry, Active Movement Scale, and Mallet scale are commonly used to assess motor function of NBPP patients. (Fig. 1)
Clinicians most commonly scale functional status of NBPP patients using the Canadian Occupational Performance Measure, Assessing Hand Assessment, and Pediatric Outcomes Data Collection Instrument. (Fig. 2)
MRI and CT scans allow noninvasive visualization of the glenohumeral joint and brachial plexus lesion to assess severity of the injury. (Fig. 3)
Splinting, Neuromuscular Electrical Stimulation, and Constraint Induced Movement are most commonly used non-surgical therapeutic modalities for NBPP patients. (Fig. 4)
Sixty-eight percent (13/19) clinicians prefer for initial visits with NBPP patients within 2-4 weeks after birth and twenty-one percent (4/19) prefer initial visit between 6-8 weeks after initial symptoms appear.
Eighty-one percent (13/16) clinicians use botox to improve range of motion and alleviate co-contractions, nineteen percent (3/16) choose other therapeutic modalities.

CONCLUSION
Currently there are no definitive guidelines for treatment. Therapeutic treatment is specific to the patient and duration of therapy is determined clinically by the time to reach functional improvement.
Infants with NPBB who demonstrate signs of recovery within the first 2 months of life have good prognosis of functional recovery. The prognosis is less predictable for infants who show delayed motor function beyond 3 months.
An aggressive regimen of routine therapies such as splinting, Neuromuscular Electrical Stimulation, and Constraint Induced Movement, in combination with botox are necessary for optimal return of function in patients by 2 years of age.

DISCUSSION
There appears to be no consistency in the use of assessment scales to grade severity of the lesion.
A controversial issue in NBPP is frequency and duration of nonoperative therapies before neurosurgical interventions.
Future research could include determine whether the most popular therapeutic modalities are also the most effective methods to reach optimal return of function in NBPP patients.

LIMITATIONS
A cross sectional study may be less suitable for investigation of rare diseases such as NBPP due to the limited sample size of NBPP clinics in the US.
Misclassification of data may occur due to recall bias.
Study participants are of a variety of clinical backgrounds, which may have led to variability in the approach they take when responding to questions. Inconsistencies may be eliminated by controlling the study audience to one specialty.

REFERENCES

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A PubMed and Google Scholar literature search was conducted using the following search terms: “brachial plexus,” “neonatal,” and “non-surgical management.” There were no studies describing variability of non-surgical management of NBPP.

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