



FEATURE ARTICLE

# CRANIOFACIAL PROGRAM - Collaboration Providing the Best Possible Outcomes

*Ruth E. Bristol MD*



The **Craniofacial Program** at Barrow Neurological Institute at Phoenix Children's Hospital is a comprehensive program focused on providing **multidisciplinary** care in the evaluation, management and treatment for infants and children with **craniofacial abnormalities**. These are conditions that

affect the shape and look of the face or head and can be present at birth or occur after injury. Many of these diagnoses do not create a neurological problem, but they can cause speech, vision or auditory difficulties. If left untreated, true **craniosynostosis** can lead to headaches and learning problems. Since there are several different kinds of synostosis, they are treated at different ages. When the team can meet and assess an infant under 3 months of age, there are some procedures that can be done more minimally invasively because the bone is

softer. Other procedures have to wait until the child is older so that the bones will hold the new shape.

[Dr. Ruth Bristol](#) (Neurosurgeon) and [Dr. Davinder Singh](#) (Plastic Surgeon) are the Co-Directors of the Craniofacial Program at Phoenix Children's Hospital. They use minimally invasive techniques whenever possible to treat craniofacial abnormalities. These conditions require a neurosurgeon to protect the brain, remove the bone pieces, and manage other problems like [Chiari](#) and [hydrocephalus](#). The plastic surgeon provides approach planning in terms of how to shape the bone pieces for the best outcome. She also manages the facial portion so that functional

structures – like eyes and the jaw – are properly aligned. The team at the [Barrow Cleft and Craniofacial Center](#) also includes a dedicated team of pediatric ophthalmologists, psychologists, geneticists, dentists, orthodontists, ENT and speech pathologists who collaborate to help patients and their families. The team meets each month. Patients are invited to come and see all of the specialists in one day, and then the group meets to make decisions about their care. This is an opportunity for specialists to meet face to face and discuss all aspects of a patient's care. Once involved with this team, children can be followed into adulthood by the same providers for long-term continuity of care.



Dr. Bristol and Dr. Singh have been working together since 2008. The surgery volumes have increased from 15 patients in the early years to 68 primary craniosynostosis surgeries in 2017. Another 75 – 100 children require secondary procedures in a variety of specialties. Sagittal synostosis is the most common. Infants under 3 months of age can have a more minimal procedure in which just the abnormal bone is taken off. For coronal synostosis, or infants who are already over 3 months at diagnosis, there are “open”

approaches, which require reshaping the bone on either the front half, or back half of the head. Some children will need two surgeries, depending on how severe the condition is.

There are a number of other conditions that are considered craniofacial abnormalities, including cleft lip and palate, which are among the most common of all birth defects, according to the [National Institute of Health](#). Other problems are less common in the general population, but seen frequently by our team, such as hemifacial microsomia, ankylosis of the temporo-mandibular joint, Pierre-Robin sequence, and the side effects of trauma.

In infants with craniosynostosis, changes in the shape of the head and face may be noticeable very soon after birth, and are usually the first and often only symptom. The child's face may not be symmetric, and another sign may be ridging along the abnormal growth plate. Some of the more complicated craniosynostosis syndromes will have other organ systems involved.



The conditions are often diagnosed after a physical examination. During the physical exam, the head circumference and cephalic index are measured. This tells the team whether the head is the right size, or whether it is long and narrow, or short and wide. These are measurements that can be followed over time. The team usually uses computed tomography (CAT scan) and sometimes magnetic resonance imaging scans (MRI) during the process of diagnosis and treatment, but these are not always necessary.



In 2018, the [Barrow Neurological Institute at Phoenix Children's neurosurgery department](#) launched its Head Shape Clinic. This clinic allows for specific evaluation of babies with concerning head shapes. While many of these children will have simple flattening (also known as [plagiocephaly](#)), some may turn out to have problems that need

surgery. At [Phoenix Children's Hospital](#), we recognize that not all pediatricians are comfortable determining which problems are surgical and which ones aren't. The goal of our Head Shape Clinic is to provide a rapid assessment of the head, at lower cost to the family, in children who are neurologically normal, and don't need a comprehensive neurological exam. The clinic is run by Dr. Bristol and Katie Klas, nurse practitioner, who has more than 15 years of experience in neurosurgery. If something more concerning is identified, patient will then be switched over to a "full length" clinic appointment, for a more in-depth assessment.

## STUDENT RESEARCH SYMPOSIUM

### Barrow at Phoenix Children's Mentees Impress

[The University of Arizona College of Medicine – Phoenix](#) (UA COM-P) has a graduation requirement for all medical students to complete a four-year scholarly project. Starting in their first year, students identify a mentor and a project to conduct as a primary researcher in order to appreciate the process of idea generation, study design, planning, execution, data analysis, and presentation. Every Spring, the UA COM-P hosts a Student Research

Symposium to highlight the scholarly work of graduating medical students. Barrow Neurological Institute at Phoenix Children's has been mentoring UA COM-P medical students since the inception of the program a decade ago. This year, 4 students presented posters and 2 of those delivered talks on their Barrow at Phoenix Children's research! Way to go students!



## Annual Epilepsy Pediatric Patient Care Conference

Please join us for a **FREE** conference for parents of children with seizure disorders!



The Annual Epilepsy Pediatric Patient Care Conference is sponsored by [Barrow Neurological Institute at Phoenix Children's Hospital](#) and the [Epilepsy Foundation of Arizona](#).

The event is free and open to all members of the community! Join us!

**I Want to Register for this Conference!**

**RECENT STORIES**



## Barrow at Phoenix Children's Annual Report

The Barrow Neurological Institute at Phoenix Children's Hospital Annual Report is now available! In it, you'll meet three of our very special patients: **Blyss, Tyler** and **Adrianna**. You'll also read about our latest research advancements as well as our team's honors and awards and how donations are helping us to pioneer breakthrough technologies and procedures to positively impact...

The Lives We Change.

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## About NeuroBLOGical

*Welcome to NeuroBLOGical: An award-winning blog by BARROW Neurological Institute at Phoenix Children's Hospital. Here, the physicians of BARROW Neurological Institute at Phoenix Children's Hospital will pediatric health care insights, patient stories and other relevant information for parents, families and the community. Do you have a topic suggestion or question? [Contact us!](#)*

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