

# Craniosynostosis and Cranial Reconstruction Center



The Craniosynostosis and Cranial Reconstruction Center at Cincinnati Children's is a national leader in caring for children with craniosynostosis, calvarial abnormalities and skull lesions. Our team features leading neurosurgery and plastic surgery experts who work together to provide advanced surgical options, including minimally invasive procedures.

## CONTACT US

For patient referrals:

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## WHAT IS CRANIOSYNOSTOSIS?

Craniosynostosis is a condition where a child's skull bones fuse early before the brain stops growing. It can happen on its own without other related abnormalities (non-syndromic) or stem from an underlying genetic condition (syndromic).

The type of craniosynostosis a child has depends on which skull suture(s) fuse. The child's head shape will present differently based on which suture(s) fuse. If left untreated, the brain will not have enough room to grow, potentially causing developmental delays and cognitive issues. It can also lead to increased pressure inside the skull.

## HOW WE'RE DIFFERENT

- **A co-surgeon clinic with a plastic surgeon and neurosurgeon**—This in-person clinic appointment allows the surgeons to collaborate on a diagnosis and treatment alongside the patient. This process improves communication and transparency with treatment decisions. By the end of the visit, the family leaves with a clear treatment plan for their child.
- **Experts in virtual surgical planning (VSP)**—Our team has been using VSP for years, employing it in select craniosynostosis cases. The VSP's advanced 3D imaging technology allows us to map out a detailed surgical plan.
- **Minimally invasive surgery expertise**—We have a long history of using minimally invasive procedures to treat craniosynostosis. Of all craniosynostosis procedures we perform, 40–60% are minimally invasive.
- **Access to the latest radiation-free imaging technology**—Our center has a specialized laser scanner that allows us to get accurate 3D measurements of the head without added radiation.
- **Personal, one-on-one support from a dedicated nurse coordinator**—This coordinator is a resource for families from the moment they contact our center. She is here to answer questions and provide reassurance throughout treatment.



Ranked #3 in the nation and #6 in Neurology & Neurosurgery.



## CRANIOSYNOSTOSIS AND CRANIAL RECONSTRUCTION CENTER TEAM

Brian Pan, MD

*Co-Director, Craniosynostosis and Cranial Reconstruction Center  
Director, Division of Pediatric Plastic Surgery*

Jesse Skoch, MD

*Co-Director, Craniosynostosis and Cranial Reconstruction Center  
Neurosurgeon, Division of Pediatric Neurosurgery*

Smruti Patel, MD

*Neurosurgeon, Division of Pediatric Neurosurgery*

Charles Stevenson, MD

*Neurosurgeon, Division of Pediatric Neurosurgery*

Scott Rapp, MD, FACS

*Plastic and maxillofacial surgeon,  
Plastic and maxillofacial surgeon,  
Division of Plastic Surgery*

Veronika Elsaesser, RN, BSN, CPN

*Nurse program coordinator,  
Craniosynostosis and Cranial Reconstruction Center*

- **Multidisciplinary team of specialists**—As one of the top three children's hospitals in the U.S., Cincinnati Children's has access to a range of subspecialists who can support craniosynostosis patients. Our team includes subspecialists from ophthalmology and neuro-ophthalmology, genetics, neuropsychology and otolaryngology.
- **A commitment to research and quality improvement**—We're dedicated to improving treatment for all craniosynostosis patients through clinical and basic science research. To improve the quality of care, our team meets monthly to discuss patient cases and review outcomes.

## TREATMENTS

Craniosynostosis treatment involves surgery to open and expand the fused skull bones, giving the brain room to grow. The type of surgery we recommend will depend on the child's age and specific diagnosis. At Cincinnati Children's Craniosynostosis and Cranial Reconstruction Center, we have decades of experience performing open and minimally invasive procedures.

### Minimally Invasive Surgery and Helmet Therapy

Depending on the child's age and diagnosis, we may be able to use minimally invasive surgery. We only consider these treatments for children younger than 6 months. Minimally invasive surgeries can include:

- **Endoscopic craniectomy or strip craniectomy**—During this procedure, the surgeon will make small incisions at the top of the child's head. The surgeon then uses an endoscope to access the skull and open the suture.

For a few months after the surgery, the child will wear a custom-made helmet. The helmet will gently mold the child's head into a more natural shape as the brain grows.

- **Cranial springs**—This procedure involves placing steel springs around the suture to create more space for the brain to grow. Surgeons remove the springs a few months after the first procedure.

### Open Surgery

If the child needs open surgery, we'll use our virtual surgical planning technology before their surgery and while in the operating room. The type of surgery we use will depend on the specific diagnosis. Surgery options can include:

- **Cranial vault reconstruction (CVR) or remodeling**—This procedure reshapes and expands skull bones. It can be done on the entire skull or individual sections.
- **Cranioplasty**—During a cranioplasty, surgeons repair skull defects or holes, either with the child's original bone or artificial bone.
- **Distraction**—This procedure expands part of the skull, most often the back of the skull (posterior vault distraction or PVR). During the procedure, surgeons remove a piece of skull and replace it with a metal device secured by screws. Eventually, bone grows over this area and surgeons remove the metal device.
- **Fronto-orbital advancement (FOA)**—During an FOA, surgeons reshape skull bones around the forehead.