

# VPI

## Finding and treating VPI in your child

This handout covers questions about a common speech disorder called VPI. It explains how we test for VPI and how it is treated at Children's — both with and without surgery.

### What is VPI?

VPI stands for Velopharyngeal (pronounced vee-lo-fare-in-gee-al) Insufficiency. The “v” in “velo” refers to the velum, or soft palate. It's the part of the roof of the mouth that moves when you say “ah.” The “p” in “pharyngeal” refers to the pharynx (pronounced fare-inks), or throat. During normal speech, the palate rises to touch the back of the throat so that air comes out of the mouth. With VPI, air escapes through the nose during speech.

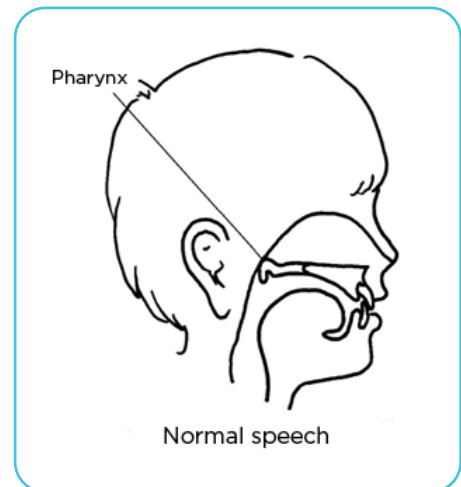
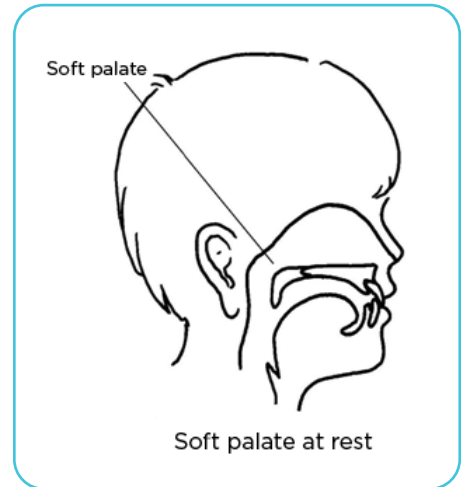
VPI is often found in children who have:

- A cleft palate (about 20 percent to 30 percent of children who have cleft palate will still have VPI after the palate repair).
- A submucous cleft palate.
- Certain syndromes, such as velocardiofacial syndrome.
- Had their adenoids removed.
- Weak throat muscles or who suffer a head injury that results in weak throat muscles.
- Too much space between the palate and the throat.

Some children have VPI from an unknown cause.

Children may have other issues that affect their speech. In developing a treatment plan it is important to find out if your child has trouble with:

- Articulation (the way they makes speech sounds)



- Speech coordination (putting the sounds together)
- Weak speech muscles
- Hearing
- Voice (the sound that comes from the larynx, or voice box)

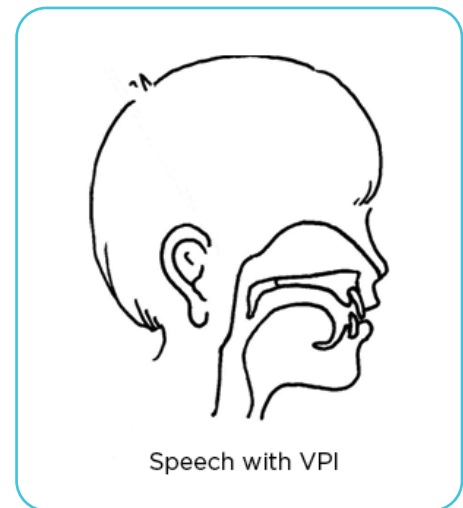
### **What are the signs of VPI in my child?**

Most children with VPI have two main speech patterns: nasal speech and release of air through the nose.

Nasal speech, called hypernasality, is when sounds other than the nasal consonants “m,” “n” and “ng” resonate through the nose. In English, the nasal consonants are the only sounds that should resonate through the nose. Most of the remaining consonants, except “h,” “w,” “y,” “l” and “r,” are referred to as pressure consonants because they require a buildup of air pressure in the mouth. Hypernasality is also detected when making vowel sounds.

The second problem, release of air through the nose, called nasal air emission, is when air escapes through the nose when your child uses pressure consonants. The pressure consonants might sound weak, or your child’s speech might sound soft or muffled. As air escapes through the nose, it might sound like puffs, squeaks or snorts.

Your child may develop unusual speech sounds to compensate for VPI. A common one is called a glottal stop, the sound produced by stopping air with the vocal cords (as one would do when saying “uh oh”). Some other sounds are made by using the tongue or palate to stop or restrict air in the mouth or throat in unusual ways.



### **Can speech therapy decrease VPI?**

A speech-language pathologist can treat some speech problems that come with VPI. Speech therapy focuses on teaching your child correct manner and place of articulation. In most cases, however, VPI speech symptoms cannot be treated solely by speech therapy.

### **Specialists who treat VPI at Children's**

A team of providers at Children's may be involved with the assessment and management of your child's VPI. The team includes:

- Speech-language pathologists. They identify VPI speech symptoms and assess for other speech problems. They also perform X-rays to look at

velopharyngeal closure during speech.

- Otolaryngologists (ear, nose and throat surgeons). They perform specialized endoscopic tests to assess velopharyngeal closure.
- Surgeons (ear, nose and throat or plastic surgeons). They perform surgeries on the palate and throat to treat VPI. (We usually operate on the palate first.)
- Orthodontists. They work with speech-language pathologists to make speech appliances called obturators.

### **How is VPI evaluated?**

Several tests are done to check for VPI in your child, most often in two or more separate appointments. First, a speech-language pathologist will assess your child's speech. The speech test takes about one hour. During this visit, a pediatric speech-language pathologist (SLP) will listen to your child's speech to determine whether or not your child has VPI. The SLP will also assess the other components of speech production (articulation, oral motor function and voice).

Once we confirm that your child has VPI, we will recommend one or two other tests, depending upon how the soft palate looks. The two other types of testing that may be recommended for your child are nasopharyngoscopy and videofluoroscopic speech study.

An otolaryngologist (ear, nose and throat doctor) performs the nasopharyngoscopy in the ENT clinic. A flexible fiber-optic tube is inserted into the nose and your child is asked to speak. This lets the doctor see the back of the throat where the velopharyngeal muscles are attempting to close.

The videofluoroscopic speech study is a special X-ray of your child's head during speech. This test requires flavored drops to be inserted into the nose so the palate and throat muscles can be seen clearly. Both of these tests are recorded and will be reviewed with you.

Recommendations for VPI treatment will be based on the results of these tests.

### **How is VPI treated at Children's?**

It is important that VPI be accurately identified. Children who have VPI may develop abnormal speech habits (we call them compensatory misarticulations). If children have developed abnormal speech habits, we need to treat the VPI, as well as the poor speech habit that has developed. We recommend treating VPI as early as possible so that these abnormal speech habits do not occur. VPI is treated with surgery or with a speech appliance as early as possible.

### **Surgery**

Speech surgeries are performed through the mouth under general anesthesia (your child is fully asleep). Children need to stay overnight in the hospital so that we can make sure they are breathing well and so that we can keep them

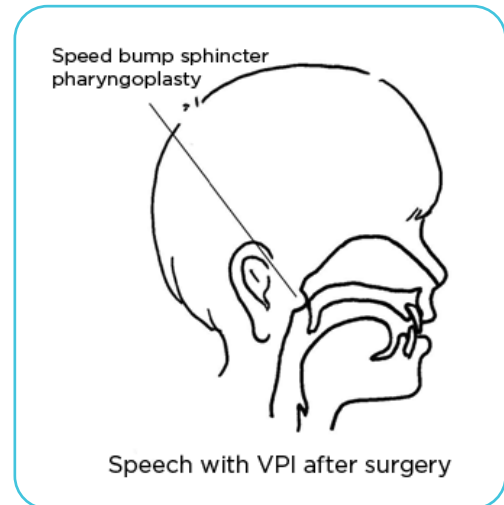
comfortable throughout the night.

At Children's, the most commonly performed speech surgeries are Furlow palatoplasty and sphincter pharyngoplasty:

- Furlow palatoplasty brings the abnormally positioned muscles of the palate into a more normal position, which helps the palate move better.
- Sphincter pharyngoplasty is done when the palate is moving as well as possible. The surgeon moves tissue from the back of the throat to the back of the nasopharynx. This will position the throat closer to the elevating palate, creating a "speed bump" in the back of the nasopharynx.

If it is decided that your child might benefit from speech surgery, your surgeon and the speech-language pathologist will discuss with you the type of surgery needed and when it should be performed. Your

child's speech will be reevaluated after surgery. If your child's speech does not improve noticeably, further surgery may be recommended.



### Obturator — the speech appliance

Sometimes, an obturator is recommended to treat VPI. An obturator is like a dental retainer with a "speech bulb" attached to the back (see the following illustration). The obturator is fitted and adjusted over several appointments by an orthodontist in the dental clinic. A speech-language pathologist helps with the final stages of fitting the obturator and monitors its ongoing effectiveness. The appliance is shaped to fit your child's unique muscle movements. It is worn during the day and taken out at night while sleeping. An obturator can be a short-term or long-term option for children with VPI. It can be used before or instead of surgery. Your child may start with an obturator and have surgery when your child is older, or they may continue to use an obturator as an adult.



### Steps in making a speech bulb obturator

Before we make an obturator, we will check your child for two things. Your child's mouth must be in a good state of health and your child must be willing to wear the obturator.

### To Learn More

- Speech and Language Services  
206-987-2104
- Ask your child's nurse or doctor
- [www.seattlechildrens.org](http://www.seattlechildrens.org)

### Free Interpreter Services

- In the hospital, ask your child's nurse.
- From outside the hospital, call the toll-free Family Interpreting Line 1-866-583-1527. Tell the interpreter the name or extension you need.
- For Deaf and hard of hearing callers 206-987-2280 (TTY).

Obturator is made in stages over a few months. Appointments are generally spaced two weeks apart to give your child time to get used to the changes.

- **Step One:** Orthodontic bands are placed on the upper-back molars, and an impression is made of the upper teeth.
- **Step Two:** A plastic retainer is made to fit your child's mouth.
- **Step Three:** After your child wears the retainer for a few weeks, a small tail-shaped piece of plastic will be added. This tail will touch the soft palate.
- **Step Four:** After a few more weeks, an extra length of tail is added.
- **Step Five:** A mini-bulb is added. This is a small plastic bulb attached to a wire that loops behind the palate.
- **Steps Six, Seven and Eight:** These are the final steps in fitting the speech bulb. At these three appointments, the SLP and the orthodontist work together to decide how the size and shape of the bulb should be changed.

### How soon will I hear improvement in my child's speech?

Speech does not usually improve while the obturator is being fitted and built. Once all the steps are completed and air escape is controlled, speech usually improves. Your child might still need speech therapy to improve some speech sounds.

### Final considerations

As speech develops, children form lifelong speech habits. Good speech habits will not occur if air escapes through the nose. If poor speech patterns persist, they are often hard to change. The longer a habit or pattern goes on, the harder it may be to change. The goal at Children's is to treat VPI as early as possible to allow your child to develop normal speech.