

Velopharyngeal Dysfunction: Diagnosis

Speech + Imaging → Diagnosis

In order to determine whether a child has velopharyngeal dysfunction (VPD), he/she needs to undergo velopharyngeal (VP) imaging while talking. Nasal regurgitation alone does not predict presence or severity of VPD for speech, and an oral exam is not enough for accurate diagnosis. VP Imaging allows the speech pathologist and the surgeon to see exactly what is happening in the palate and throat area when the child talks, and is **important in order to determine optimal treatment.**

Speech pathologists and surgeons work together to make the diagnosis of VPD.

Speech Evaluation

- Speech pathologist (SP) will likely do the following things:
 - Get speech-samples from the child
 - Squeeze the child's nose and listen for the difference with the nose open vs. nose closed
 - Put a mirror below the nose to look and listen for air escaping out of the nose
 - Evaluate articulation and look for palate-related speech errors.

Requirements for Velopharyngeal Imaging

- VP imaging must be done while the child is speaking.
 - **VPD cannot be evaluated in children who do not talk.**
- The child needs to be able to say pressure consonants as accurately as possible.
 - Need at least 1 or 2 accurately attempted consonants (P, B, D, F, S, K, or T)
 - Need to imitate speech on command
- The child needs to cooperate for imaging. He/she cannot be sedated.
- The average age for diagnosis with imaging is **4-5 years** in children with 22q11.2DS.
 - Diagnosis can occur earlier but may be more difficult, especially if the child has speech and language delays.

There are two main types of velopharyngeal imaging: **video fluoroscopy** and **nasopharyngoscopy**. Please see the next page for more information.

Most children aged 4 and up are able to cooperate sufficiently for nasopharyngoscopy (the preferred method). If they cannot tolerate it, they may undergo video fluoroscopy instead.

Velopharyngeal Dysfunction: Diagnosis (Continued)

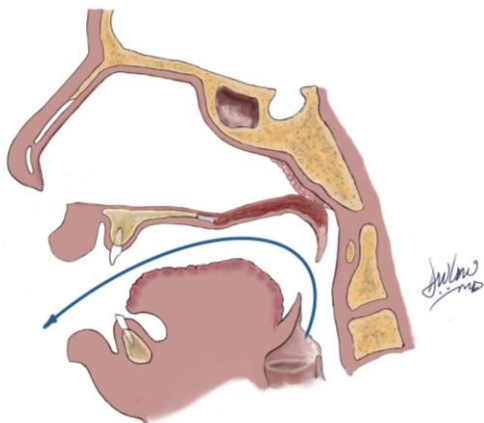
Video Fluoroscopy

- The radiologist will place barium into the child's nose to highlight the velopharyngeal mechanism during X-ray.
- The child must imitate a short standard speech sample while the radiologist takes a video x-ray of their palate.
 - The child must be able to talk, and the words must include oral pressure consonants (P, B, T, etc.)
 - Crying or only making M and N sound will not provide a proper diagnosis.

Nasopharyngoscopy

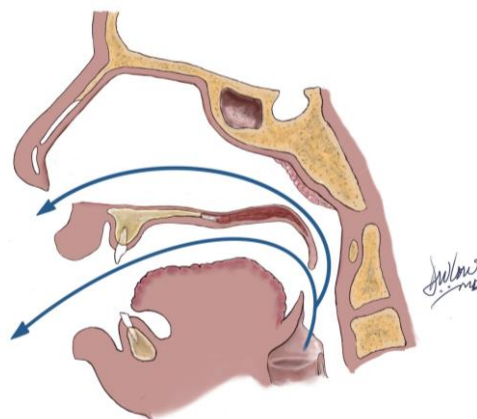
- In some medical centers, the child may get a spray of medicine to numb the nose.
- The surgeon or speech pathologist puts a thin, flexible fiberoptic camera through the nose to the back of the throat.
- Once the camera is inserted to view the VP valve, the speech pathologist asks the child to produce a speech sample (which must include oral consonants (such as P, B, T, F, S, K)).

Analysis of the VP Imaging Results (During Speech)



Normal closure

There is an airtight seal for pressure sounds. The soft palate, the back & sides of the throat come together to squeeze down and close off the nose from the mouth.



Velopharyngeal dysfunction

When the child talks, complete closure is not achieved. Also, in at least 20% of children with 22q11.2DS, pulsations may be present at the back of the throat due to a displaced carotid artery.

VP imaging results are necessary for VPD diagnosis and surgical planning.

For more info, see the video [22q11.2 VPD AND HYPER-NASAL SPEECH](#) from the 22q Family Foundation.