Clinical and Anatomical Information

Nasal Valve Collapse Diagnosis Coding

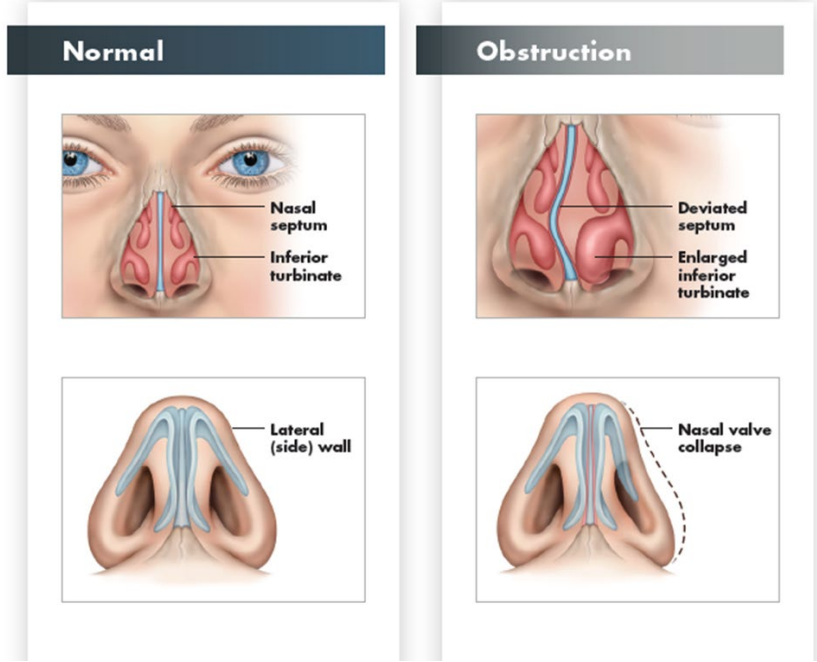
Otolaryngology

Nasal Airway Obstruction Overview

- Nasal breathing is a fundamental part of the respiratory cycle and delivers approximately 70% of airflow to the lungs and even slight narrowing of the nasal valve can lead to significant reduction in airflow[1 3 4 5]
- Nasal airway obstruction (NAO) is a source of significant patient discomfort[2]
- Patients with severe anatomical abnormalities often require interventions to treat the root cause of the problem

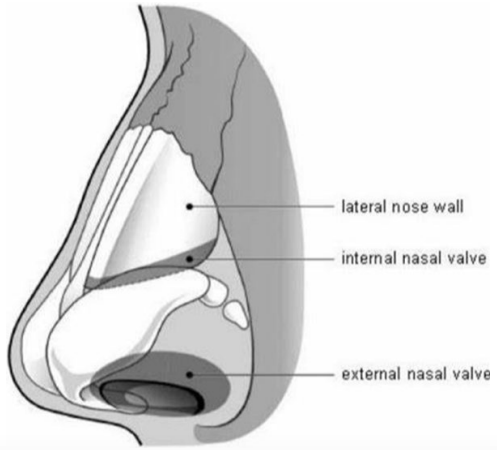
Anatomical causes of NAO include:

- **Septal Deviation** – The cartilage and bony wall between the nostrils can bend and block the nasal passage
- **Turbinate hypertrophy** – Ridges of bone and tissue inside your nose can limit airflow when enlarged
- **Nasal Valve Collapse (NVC)** – Weak or excessively flexible upper/lower cartilage in the outer nasal wall may cause it to collapse inward when a person inhales.



Nasal Valve Collapse Overview

- 2010 CCS developed by American Academy of Otolaryngology
  - Defines Nasal Valve Collapse
- NVC is a distinct clinical entity separate from other anatomical reasons for NAO[6].
  - The nasal valve includes both external and internal cross-sectional area of the nasal cavity[6]
    - Greatest overall resistance to airflow[6]
    - Dominant determinant for nasal inspiration[6]
  - When air enters these narrowed segments, acceleration occurs[7]
    - Leads to a decrease in intraluminal pressure (Bernoulli's principle)[7]
    - Collapses the lateral nasal wall, where minor septal deviations, weakened soft tissue, or malformed lateral crura can have a great impact on nasal airflow[6]



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ORIGINAL RESEARCH–FACIAL PLASTIC AND RECONSTRUCTIVE SURGERY

Clinical consensus statement: Diagnosis and management of nasal valve compromise

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ABSTRACT

OBJECTIVE: To create a clinical consensus statement to address ambiguities and disparities in the diagnosis and management of nasal valve compromise (NVC).

SUBJECTS AND METHODS: An updated systematic review of the literature was conducted. In addition, a Modified Delphi Method was used to refine expert opinion and facilitate a consen-

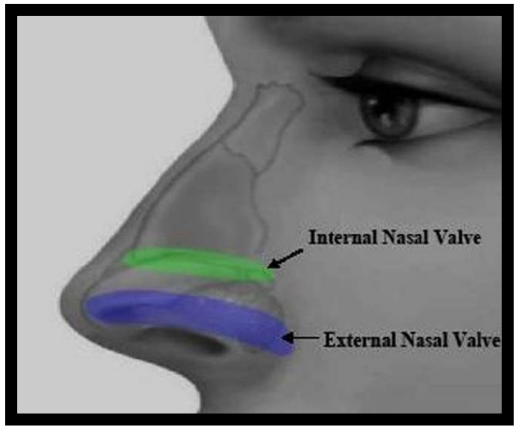
terminology (CPT) billing coding schemes for nasal valve surgery are unclear, as are the boundaries and overlap with other nasal surgical codes.

The nasal valve, external and internal components, has been described anatomically as the cross-sectional area of the nasal cavity with the greatest overall resistance to airflow, thus acting as the dominant determinant for nasal inspiration (Fig 1). The external nasal valve is defined as the area in the vestibule, under the nasal ala, formed by the caudal septum, medial crura of the alar cartilages, alar rim

Nasal Valve Anatomy

The nasal valve is the narrowest portion of the human airway. Anatomically, it is broken down into an internal and external nasal valve.[2]

- **Internal nasal valve**
  - structure formed by articulation of the anterior ridge of the upper lateral cartilage with the anterior septal edge
  - a common cause of nasal airway obstruction when the nasal sidewall and the internal valve are unstable.[6]
  - Normal angle is 10-15 degrees; with a more narrow angle leading to nasal obstruction



- **External nasal valve**
  - valvelike fold formed by the lateral crus of the alar (i.e., lower lateral) cartilage and its associated external and vestibular soft tissue coverings
  - a common cause of nasal airway obstruction when the valve is incompetent and the alar rim collapses during inspiration.[6]
  - Assess alar rims for notching or eversion on inspiration: may be a compensatory response

Static vs Dynamic

- Static and Dynamic
  - Static – at rest, not during movement i.e., not while breathing[8]
    - "Due to fixed limited cross-sectional area of the nasal valve"[9]
  - Dynamic – pertaining to or manifesting force – during inspiration[8]
    - "Occurs secondary to lateral wall insufficiency"[9]
- References to static and dynamic in multiple clinical papers
- The internal valve as well as the external valve can be either static, dynamic or both
- Patients often present with multiple issues

Nasal Valve Collapse Prevalence

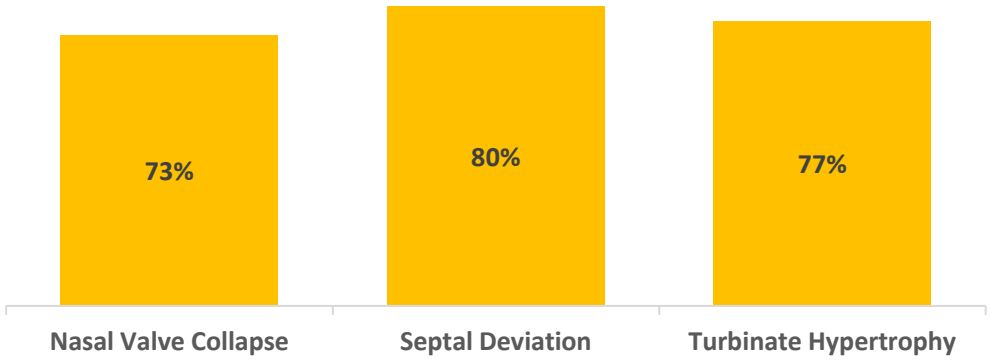
Largest known prevalence assessment for anatomic contributors of NAO[1]

- 50 US otolaryngologists
- Up to 50 consecutive nasal and/or sinus patients per physician
- 1,906 patients with sinonasal complaints assessed

Results[1]

- 63.5% of patients had **severe or extreme NAO (≥55 NOSE).**
- **NVC is as prevalent** as septal deviation and inferior turbinate hypertrophy
- **Missed or untreated NVC may be associated with the persistence of NAO symptoms as NVC was present in 82% of patients with severe or extreme NAO who had previously undergone septoplasty and/or inferior turbinate reduction**

Prevalence of Anatomic Contributors to NAO (patients with severe/extreme NOSE scores)[1]



ENT JOURNAL

Nasal airway obstruction: Prevalence and anatomic contributors

By David W. Clark, MD; Anthony G. Del Signore, MD, PharmD; Roheen Raithatha, MD; Brent A. Senior, MD

Physician Diagnosis of NVC

- Patient History[2,6]
- Physical Examination –Anterior Rhinoscopy, Nasal Endoscopy[2,6]
- Modified Cottle Maneuver[2]
  - Used to assess internal and external nasal valves
- Possible imaging for other factors (IT, SD)[2]
- Patient reported NOSE Score (identifies severity)
  - NOSE is validated standard of measure of severity[10]

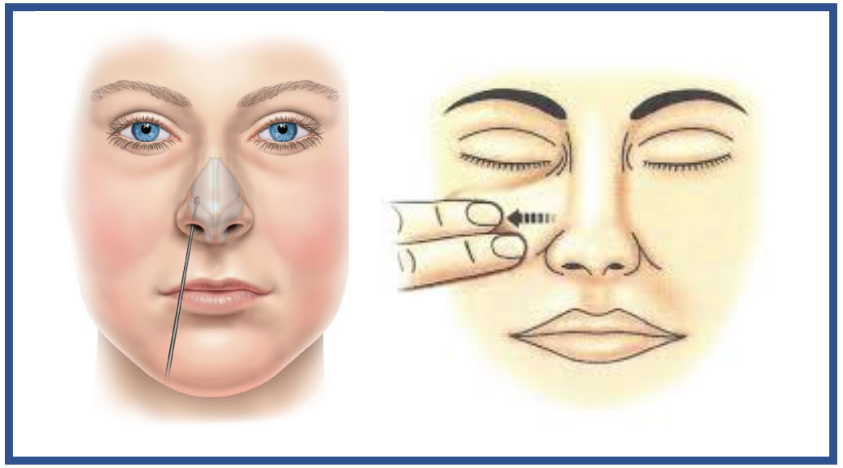
Over the past **one month**, how much of a problem were the following conditions for you?
Please note the most correct response for each category.

NOSE assessment[1]

Symptoms	Not a problem	Very mild problem	Moderate problem	Fairly bad problem	Severe problem
Nasal congestion or stuffiness	0	1	2	3	4
Nasal blockage or obstruction	0	1	2	3	4
Trouble breathing through my nose	0	1	2	3	4
Trouble sleeping	0	1	2	3	4
Unable to get enough air through my nose during exercise or exertion	0	1	2	3	4
				Total x5	

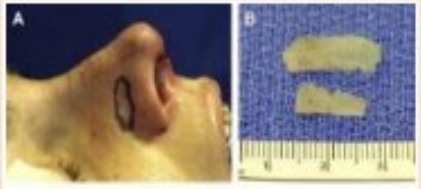
Nasal obstruction severity classification:[2]	Mild (5-25)	Moderate (30-50)	Severe (55-75)	Extreme (80-100)

Modified Cottle Maneuver [11]

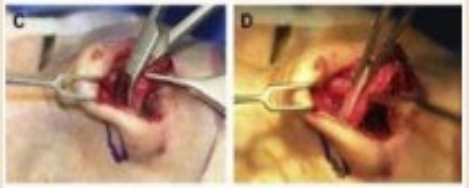


Treatment Options for Nasal Valve Collapse

Lateral wall collapse
upon inhalation due to incompetent nasal valves = blocks airflow



Batten graft



Open rhinoplasty

Patient's lateral wall is reinforced, BUT the surgery has altered the thickness and width of the nose.

Multiple Treatment Options [12,13]	
Alar rim grafts	Spreader grafts
Articulated alar rim graft	Spreader flaps
Lateral crural strut graft	Flaring sutures
Lateral crural turn-in flap	Absorbable Implants
Lateral crural turn over flap	Radio Frequency
Alar batten graft	

Diagnosis Codes: ICD-10-CM

- No current Diagnosis Code for Nasal Valve Collapse
  - Currently recorded under J34.89 “Other specified disorders of nose and nasal sinuses” all-inclusive ICD-10-CM
    - Multiple patient issues fall under that code
- Designated code would allow for:
  - Better track disease prevalence / epidemiologic monitoring
  - Help to better define patient treatment options
  - Increase effectiveness of treatment and patient outcomes
  - Evaluate symptom and any associated co-morbidities
  - Improved retrospective studies comparing best treatment and management practices and
  - Encouragement of research and clinical trials

References

1. Clark DW, DelSignore AG, Raithatha R, Senor B. Nasal airway obstruction: prevalence and anatomic contributors. *Ear Nose Throat J*. 2018;97:173-176.
2. Chandra RK, Patadia MO, Raviv J. Diagnosis of nasal airway obstruction. Otolaryngol Clin North Am. 2009 Apr;42(2):207-25, vii. doi: 10.1016/j.otc.2009.01.004. PMID: 19328887.
3. Crawford-Brown, Theoretical and Mathematical Foundations of Human Health Risk Analysis; 1997, Page 103
4. Wever CC. The nasal airway: a critical review. *Facial Plast Surg*. 2016;32:17-21.
5. Camacho M, Riaz M, Capasso R, et al. The effect of nasal surgery on continuous positive airway pressure device use and therapeutic treatment pressures: a systematic review and meta-analysis. *Sleep*. 2015;38:279-286.
6. Rhee JS, Weaver EM, Park SS, et al. Clinical consensus statement: Diagnosis and management of nasal valve compromise. Otolaryngology–Head and Neck Surgery. 2010;143(1):48-59. doi:10.1016/j.otohns.2010.04.019
7. Tsao Allergy Rhinol 2013; Iglesias-Souto et al. Clinical and Molecular Allergy 2009 Pharmaceutics 2014; Pharmaceutical Aerosol Deposition in Human Nasal–Laryngeal Airways
8. American Academy of Otolaryngology - Head and Neck Surgery (2023, March 22). *Position Statement: Nasal Valve Repair*. Www.Entnet.org. https://www.entnet.org/resource/position-statement-nasal-valve-repair/
9. Khanwalkar, A., Welch, K. Update on the Evaluation and Management of Nasal Valve Collapse. *Curr Otorhinolaryngol Rep* **9**, 399–408 (2021). https://doi.org/10.1007/s40136-021-00374-2
10. Stewart MG, Witsell DL, Smith TL, Weaver EM, Yueh B, Hannley MT. Development and validation of the Nasal Obstruction Symptom Evaluation (NOSE) scale. Otolaryngol Head Neck Surg. 2004 Feb;130(2):157-63.
11. Images retrieved from https://noserevisionsurgeryandsurgeons.blogspot.com/2019/10/diagnosing-nasal-valve-collapse.html and https://mdmonthly.com/how-do-you-know-if-you-have-nasal-airway-obstruction/ on August 30, 2022
12. Lee J, White MW, Constantinides M, Surgical and Nonsurgical Treatments of the Nasal Valves, Otolaryngol Clin N Am (2009)
13. Becker, Daniel G., et al. "Surgical treatment of nasal obstruction in rhinoplasty." *Aesthetic surgery journal* 30.3 (2010): 347-378
14. Lin et al, Nasal Aerodynamics. https://emedicine.medscape.com/article/874822-overview. Created May 14, 2015. Updated Nov 12, 2018. Accessed Jan 23, 2019.

Thank You