

The Effectiveness of the Modified Valsalva Maneuver in Terminating Episodes of Supraventricular Tachycardia

Question

In patients with SVT, how does the implementation of modified Valsalva maneuvers compared to other interventions affect the termination of SVT?

Background

- Supraventricular Tachycardia (SVT) is a common arrhythmia characterized by rapid heart rates which affect the upper chambers of the heart.
- SVT affects 2.25 in 1000 people across the lifespan (Kotadia et al., 2020).
- Modified Valsalva maneuver (mVM) has been suggested to be 2.5 times more effective than the standard Valsalva maneuver (sVM), which is the most commonly used vagal maneuver (Abdulhamid et al., 2021).

Definitions

- **Standard Valsalva Maneuver (sVM):** Patient is placed in a supine position, takes a deep breath and then blows out against a closed glottis or a 10 mL syringe with a plunger for 10-15 seconds (Niehues & Klovenski, 2021).
- **Modified Valsalva Maneuver (mVM):** Patient begins sitting up and blows against a closed glottis or a 10 mL syringe with a plunger for 10 to 15 seconds then immediately placed into a supine position with their legs raised to a 45-90° angle for 45 seconds to a minute (Niehues & Klovenski, 2021).
- **Carotid Sinus Massage (CSM):** Patient lays in a supine position with their head turned away from the medical provider. The provider uses their fingertips to apply pressure to the carotid sinus for 5-10 seconds (Niehues & Klovenski, 2021).
- **Head Down Deep Breathing (HDDB):** Patient lays supine on a bed with a head down tilt at a 30-45° angle. The patient takes 5 deep breaths and holds each one for 10 seconds, or as long as is tolerated.

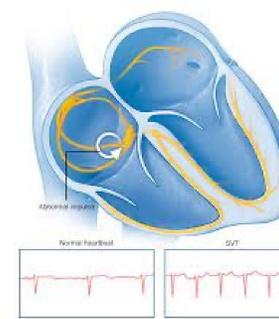


<https://www.premiercardiology.com/blog/svt-could-be-the-cause-of-your-racing-heart>

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<https://healthblog.uofmhealth.org/heart-health/your-racing-heart-a-sign-of-supraventricular-tachycardia>

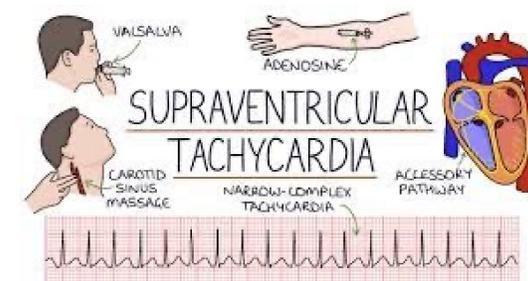


<https://www.mayoclinic.org/diseases-conditions/supraventricular-tachycardia/symptoms-causes/syc-20355243>

Study	Description	Results
Initial and Sustained Response Effects of 3 Vagal Maneuvers in Supraventricular Tachycardia: A Randomized, Clinical Trial, Ceylan et al., 2019	<ul style="list-style-type: none"> ➤ The study is level II evidence and was conducted over an 18-month period from 2016 to 2017 in a single emergency department. ➤ 98 patients over the age of 18 were included in the study and were divided into groups testing mVM, sVM, or CSM. 	<ul style="list-style-type: none"> ➤ The mVM was the most successful intervention with a success rate of 43.7%. ➤ sVM had a success rate of 24.2%, and CSM was 9.1% successful. ➤ The group of patients in the mVM group were the youngest group of patients, which could have affected the results.
A Multicenter Randomized Controlled Trial of a Modified Valsalva Maneuver or Cardioversion of Supraventricular Tachycardia, Chen et al., 2020	<ul style="list-style-type: none"> ➤ The study is level II evidence and was conducted in 5 emergency departments in China over a 2-year period between 2015 and 2017. ➤ A total of 238 patients were included in the study. ➤ Half the patients performed mVM and the other half performed sVM. 	<ul style="list-style-type: none"> ➤ The success rate for mVM was 46% while the success rate for the sVM group was 16%. ➤ The study found mVM to be very effective in the short RP interval subtype of SVT with a success rate of 66%. ➤ An RP interval that is longer than half of the tachycardia cycle on an ECG was used to separate the subtypes.
Randomized Controlled Trial Assessing Head Down Deep Breathing Method Versus Modified Valsalva Maneuver for Treatment of Supraventricular Tachycardia in the Emergency Department, Lim et al., 2021	<ul style="list-style-type: none"> ➤ The study is level II evidence and was conducted in one emergency department in China for an 18-month period. ➤ There were 41 patients included in the study. ➤ mVM was compared to the HDDB method with 19 patients assigned to each group. 	<ul style="list-style-type: none"> ➤ 26.3% patients in the mVM group achieved cardioversion on the first attempt, and a total of 36.8% achieved cardioversion in fewer than 3 attempts. ➤ The HDDB group had a 31.6% total rate of cardioversion, with 21.1% achieving cardioversion on the first attempt. ➤ The small sample size is very limiting to the study.

Conclusion

- Each study showed mVM to be the most effective intervention used.
- The specific mVM procedure for each study was different, which leads to inconclusive results regarding overall effectiveness of mVM.
- Further research is needed to determine the true effectiveness of mVM in terminating episodes of SVT.
- The exact procedure for mVM needs to be standardized before efficacy can be determined.



<https://www.youtube.com/watch?v=f5xCSofq4aE>

Clinical Application

- Nurses can teach patients how to implement mVM outside the hospital setting.
- Utilizing mVM as a first line treatment can give patients a better sense of control over their SVT and prevent further complications from occurring.
- mVM is a cost-effective intervention that can decrease the number of emergency department visits and overall medical costs for patients with SVT.
- Teaching patients to properly perform mVM upon diagnosis of SVT can decrease complications and increase positive outcomes for the patients.