Detection of Bronchiolitis Obliterans Syndrome after Pediatric Hematopoietic Stem Cell Transplantation.

An Official American Thoracic Society Clinical Practice Guideline

COG Supportive Care Endorsed Guidelines

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"Detection of Bronchiolitis Obliterans Syndrome after Pediatric Hematopoietic Stem Cell Transplantation", developed by the American Thoracic Society, was endorsed by the COG Supportive Care Guidelines sub-Committee in June 2025.

The source guideline is published (Shanthikumar S, Gower WA, Srinivasan S, et al. Detection of bronchiolitis obliterans syndrome after pediatric hematopoietic stem cell transplantation: an official American Thoracic Society clinical practice guideline. Amer J Resp Critical Care Medicine. 2024; 210(3):262-80.) and is available at: https://doi.org/10.1164/rccm.202406-1117ST

The purpose of the source guideline is to provide an evidence-based approach to detection of post-HSCT BOS in children. The recommendations from the endorsed clinical practice guideline are presented in the table below.

Summary of Recommendations for Detection of Bronchiolitis Obliterans Syndrome (BOS) after Pediatric Hematopoietic Stem Cell Transplantation (HSCT)

RECOMMENDATIONS	Strength of Recommendation and Quality of Evidence*
1. We recommend pre-HSCT spirometry, static lung volumes, and Diffusing Capacity of the Lungs for Carbon Monoxide (D_{LCO}) for children who can perform them.	Strong recommendation Moderate certainty of evidence
2a. We suggest active surveillance rather than testing only symptomatic patients using spirometry and, where feasible, static lung volumes and D_{LCO} beginning at 3 months post-HSCT.	Conditional recommendation Low certainty of evidence
2b. We suggest that spirometry and, where feasible, static lung volumes and D_{LCO}, be performed every 3 months in the first year post-HSCT and every 3 to 6 months in the second year post-HSCT in patients who are not at high risk of BOS.	Conditional recommendation Low certainty of evidence
2c. For long-term follow-up in asymptomatic patients, we suggest surveillance using spirometry and, where feasible, static lung volumes and D_{LCO} every 6 months, between 2 and 3 years post-HSCT and yearly after 3 years, lasting until10 years post-HSCT.	Conditional recommendation Low certainty of evidence
3a. At centers with adequate technical expertise to perform multiple breath washout (MBW), we suggest including MBW and spirometry as part of a pre-HSCT assessment of pulmonary function, or MBW alone if spirometry is not feasible.	Conditional recommendation Low certainty of evidence
3b. At centers with adequate technical expertise to perform MBW, we suggest the use of post-HSCT MBW as part of the diagnostic evaluation of suspected BOS, either as a complementary tool to spirometry or alone if spirometry is not feasible.	Conditional recommendation Very low certainty of evidence
4a. We suggest performing a chest computerized tomography (CT) scan, with inspiratory and expiratory views, in all children before allogeneic HSCT.	Conditional recommendation Low certainty of evidence

RECOMMENDATIONS	Strength of Recommendation and Quality of Evidence*
4b. We suggest performing a chest CT scan with inspiratory and expiratory views in all children post–allogeneic HSCT who develop obstructive lung function or in those children with clinical suspicion of BOS.	Conditional recommendation Low certainty of evidence
5. We suggest that bronchoscopy with bronchoalveolar lavage (BAL) be performed to assess for infection as part of the BOS evaluation.	Conditional recommendation Very low certainty of evidence
6. We suggest surgical lung biopsy in pediatric post-HSCT patients in cases where BOS is suspected but uncertainty regarding the diagnosis exists and the risks of biopsy are smaller than the risks of the uncertainty.	Conditional recommendation Low certainty of evidence

*see Appendix 1

Appendix 1: Systems for Classifying Recommendations and Evidence used by the Source Clinical Practice Guidelines

I. GRADE

Strength of Recommendations:

Strong Recommendation	When using GRADE, panels make strong recommendations when they are confident that the desirable effects of adherence to a recommendation outweigh the undesirable effects.
Conditional Recommendation	Conditional recommendations indicate that the desirable effects of adherence to a recommendation probably outweigh the undesirable effects, but the panel is less confident.

Strength of Recommendations Determinants:

Factor	Comment
Balance between desirable and undesirable effects	The larger the difference between the desirable and undesirable effects, the higher the likelihood that a strong recommendation is warranted. The narrower the gradient, the higher the likelihood that a weak recommendation is warranted
Quality of evidence	The higher the quality of evidence, the higher the likelihood that a strong recommendation is warranted
Values and preferences	The more values and preferences vary, or the greater the uncertainty in values and preferences, the higher the likelihood that a conditional recommendation is warranted
Costs (resource allocation)	The higher the costs of an intervention—that is, the greater the resources consumed—the lower the likelihood that a strong recommendation is warranted

Quality of Evidence

High Quality	Further research is very unlikely to change our confidence in the estimate of effect
Moderate Quality	Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
Low Quality	Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
Very Low Quality	Any estimate of effect is very uncertain

Guyatt, G.H., et al., *GRADE: an emerging consensus on rating quality of evidence and strength of recommendations.* BMJ, 2008; 336: 924-926.
Guyatt, G.H., et al., *GRADE: going from evidence to recommendations.* BMJ, 2008; 336: 1049-1051.