

Table I. Differences between pulmonary complications of hematopoietic stem cell transplantation (complications are listed in an order of predicted onset)

	History/onset	Symptoms	Radiology	PFT/ catheterization	BAL	Histology (TB or surgical via VATS)
PEGS	<ul style="list-style-type: none"> • *Periengraftment • G-CSF use • More common in autoHCT • Acute onset 	<ul style="list-style-type: none"> • Fever • *Rash 	<ul style="list-style-type: none"> • Diffuse infiltrates 	<ul style="list-style-type: none"> • Not needed 	<ul style="list-style-type: none"> • Neutrophil predominance 	<ul style="list-style-type: none"> • Not needed
DAH	<ul style="list-style-type: none"> • *Periengraftment • Median 23 days • Acute onset 	<ul style="list-style-type: none"> • Dyspnea • Cough • Hypoxemia • Often fever • Rarely hemoptysis 	<ul style="list-style-type: none"> • Bilateral areas of ground-glass attenuation or consolidation involving middle and lower lung zones 	<ul style="list-style-type: none"> • Not useful 	<ul style="list-style-type: none"> • *Bloody • Or greater than 20% hemosiderin-laden macrophages 	<ul style="list-style-type: none"> • Diffuse alveolar damage with alveolar hemorrhage
IPS	<ul style="list-style-type: none"> • 21 to 65 days (range 0 to 1,600 days) • Subacute onset 	<ul style="list-style-type: none"> • Dyspnea • Dry cough • Fever 	<ul style="list-style-type: none"> • Diffuse bilateral interstitial infiltrates 	<ul style="list-style-type: none"> • Not useful 	<ul style="list-style-type: none"> • Excludes infection 	<ul style="list-style-type: none"> • TB will suffice • Diffuse alveolar damage or • Interstitial pneumonitis
PCT	<ul style="list-style-type: none"> • 2 to 3 months • Children • GVHD 	<ul style="list-style-type: none"> • Cough • Chest pain • Fever 	<ul style="list-style-type: none"> • Peripheral nodules 	<ul style="list-style-type: none"> • Not needed 	<ul style="list-style-type: none"> • Excludes infection, in particular IFI 	<ul style="list-style-type: none"> • VATS is optimal • *Occlusive vascular lesions and hemorrhagic infarcts
BOOP	<ul style="list-style-type: none"> • 2 to 12 months • Acute onset 	<ul style="list-style-type: none"> • Fever • Dyspnea • Dry cough 	<ul style="list-style-type: none"> • Peripheral or peribronchovascular patchy infiltrate 	<ul style="list-style-type: none"> • *Restrictive • Normal FEV₁/FVC • ↓DLCO • ↓TLC 	<ul style="list-style-type: none"> • Excludes infection • Lymphocyte predominance 	<ul style="list-style-type: none"> • *Peribronchiolar lymphocytic infiltration • Fibrosis and granulation tissue in the lumen of the distal airways
BO	<ul style="list-style-type: none"> • Greater than 100 days • 6 to 12 months • GVHD • *AlloHCT • Insidious onset 	<ul style="list-style-type: none"> • *No fever • Wheezing 	<ul style="list-style-type: none"> • Normal • Hyperinflation • Air trapping • Small airway thickening • Bronchiectasis • Pneumothorax in advanced cases 	<ul style="list-style-type: none"> • *Obstructive • FEV₁ less than 75% • FEV₁:FVC less than 0.7 • RV greater than 120% • Normal or ↓DLCO 	<ul style="list-style-type: none"> • Excludes infection • Neutrophil predominance 	<ul style="list-style-type: none"> • Intraluminal dense fibrosis • Narrowing or obliteration of lumen of bronchioles • No mononuclear cell infiltration in interstitial or alveolar tissue.
VOD of lung	<ul style="list-style-type: none"> • Male 	<ul style="list-style-type: none"> • Dyspnea • Syncope • Rarely hemoptysis 	<ul style="list-style-type: none"> • *Septal lines • Ground-glass opacities • Lymph node enlargement 	<ul style="list-style-type: none"> • DLCO less than 55% • *Pulmonary HTN • Normal PCWP (less than 15 mmHg) 	<ul style="list-style-type: none"> • Occult alveolar hemorrhage • Excludes infection 	<ul style="list-style-type: none"> • Not recommended

*Most important factor in differential diagnosis

Abbreviations:

- PEGS: periengraftment syndrome
- DAH: [diffuse alveolar hemorrhage](#)
- IPS: idiopathic pneumonia syndrome
- PCT: pulmonary cytolytic thrombi
- BO: bronchiolitis obliterans
- BOOP: bronchiolitis obliterans organizing pneumonia
- GVHD: graft-versus-host disease
- IFI: invasive fungal infections
- VOD: veno-occlusive disease of lung
- TB: transbronchial biopsy
- VATS: video-assisted thoracoscopic surgery
- HTN: hypertension
- TLC: total lung volume
- RV: residual volume
- PCWP: pulmonary capillary wedge pressure
- DLCO: diffusion lung capacity for carbon monoxide
- PFT: pulmonary function test
- G-CSF: granulocyte colony-stimulating factor