

Hyperbaric Oxygen (HBO2) in Patients with Delayed Ventilation

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Disclosures

Unfortunately none



Introduction

- Delayed ventilation may increase risk for pulmonary barotrauma during HBO2 decompression.
- However pulmonary risk stratification is not formalized
 - Perhaps because pulmonary barotrauma occurrence in HBO2 is low?



Methods

- We developed an algorithm for pulmonary risk assessment of HBO2 patients in 2005 to include ventilation scanning.
- This also included utilization of chest x-ray, and PFTs.



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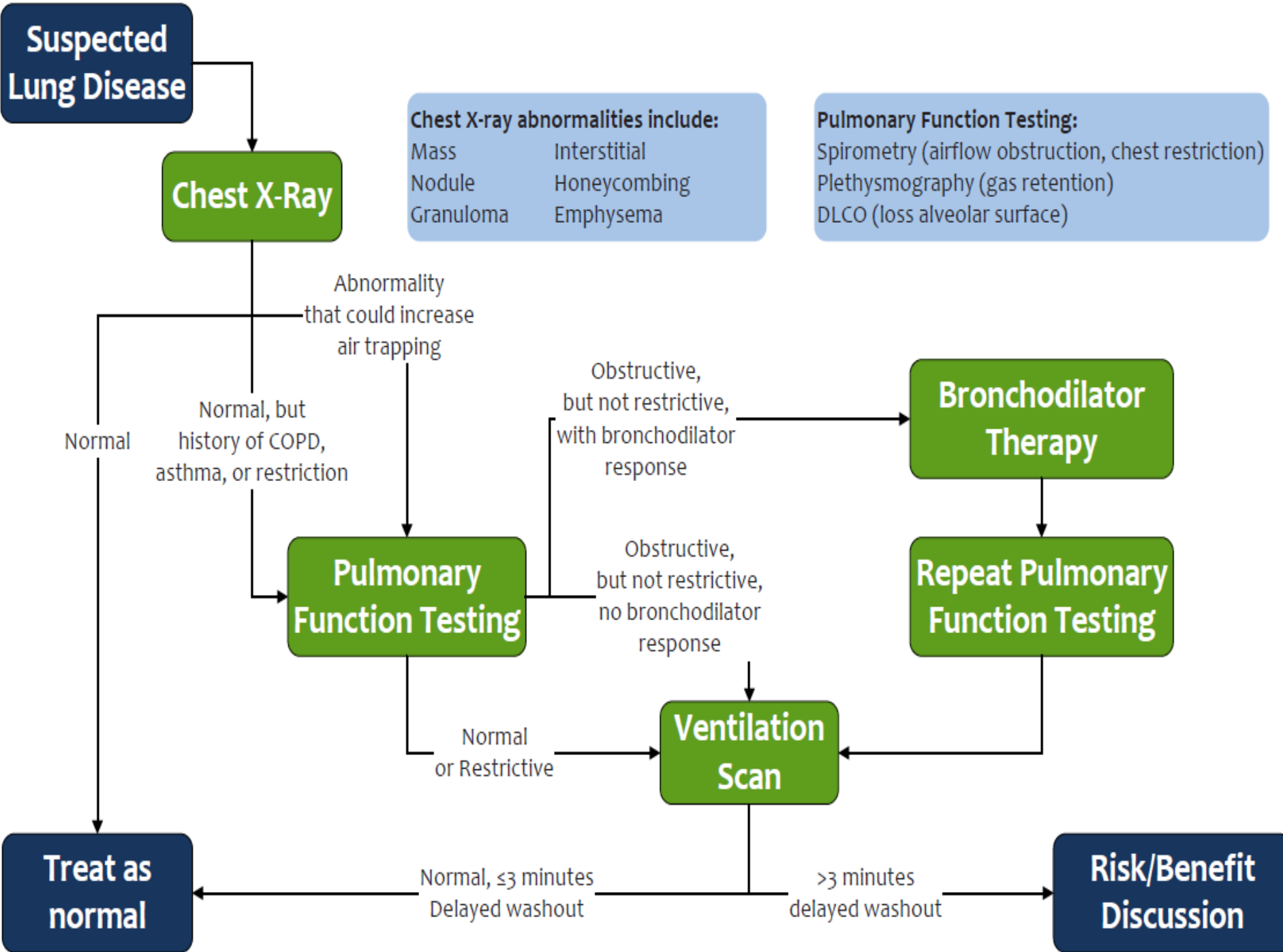
1 MIN EQUILIBRIUM

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30 min washout

GE MEDICAL





Previous Abstract for Ventilation Scan

- HYPERBARIC OXYGEN IN PATIENTS WITH DELAYED VENTILATION-2006
 - Churchill, S; Weaver, LK
 - 12/16 with delayed ventilation were treated without adverse events.
 - Conclusions: Patients with delayed ventilation may be treated with HBO2. Bronchodilators may improve ventilation in some. HBO2 was not offered to the patient with lung bullae, so we cannot extrapolate these results to bullous disease.
 - Presented an Algorithm for Pulmonary risk.



Methods

- To determine the algorithm's adherence and possibly its utility.
 - Performed a retrospective review of patients treated at LDS Hospital and Intermountain Medical Center.
 - Searched for patients identified with any lung problem
 - (history of emphysema, asthma, radiation therapy, lung cancer, nodules, pneumonia, lung trauma, surgery, and smoking)
- We tried to estimate algorithm adherence, evaluation results, and complications with HBO2.



Results

- From 1/2005 - 2/2014
- 92 patients in the LDS Hospital database, at risk for pulmonary complications.
- They underwent:
 - Chest radiography (65),
 - Pulmonary Function Testing (32)
 - Chest CT (29)
 - Ventilation scanning (44)



Results

- **26 of 92 were not treated.**
 - 3 healed
 - 2 had cardiac risk (low EF)
 - 9 ended up not having an indication
 - 1 refused without a documented reason
 - 1 refused d/t anxiety
 - 1 rejected by insurance
 - 2 lost to follow-up
 - **7 were not treated due to respiratory concerns**
 - 1 d/t large pleural effusion
 - 2 Bullous disease
 - 1 d/t uncontrolled asthma (CO pt)
 - 2 d/t severe COPD with hypoxia
 - 1 neurologic – Guillain Barre complications (respiratory drive)



Results

10 of 92 HBO2 were discontinued prematurely

- **Session #1 – Acute pulmonary edema**
- Session #3 – neurological difficulty
- Session #3 – logistics
- Session #3 – cost
- Session #4 – reevaluation of risk/benefit
- Session #8 – inconsistently present
- Session #14 – Pt declined – too tired
- **Session #15 – breathlessness**
- Session #20 – glucose control problems
- Session #30 – lost to followup



Results

- **44 of 92 had ventilation scans** for air possible trapping
 - **28 patients showing delayed ventilation**
 - » (>5 minute delayed washout).
 - **26 had uneventful HBO2 treatments (726 total sessions)**
- The remaining two did not receive HBO2.
 - 1st had >40 minutes of washout and cardiac risk factors
 - 2nd >20 minutes washout, and declined HBO2 because of bullous disease.



Conclusions

- Carefully screened patients with delayed ventilation may be treated safely with HBO2.
- HBO2 was not offered to the patient with lung bullae, so we cannot extrapolate results to patients with bullous lung disease.
- The adherence of our algorithm showed decreased PFTs compared to expected number of ventilation scans – possibly due to methods in the study which need further review.
- Although 26 patients were successfully treated with delayed ventilation (726 treatments), more studies are needed.



Questions?



Previous Abstract for Ventilation Scan

- XENON VENTILATION STUDY AS A SCREENING TOOL FOR HYPERBARIC OXYGEN THERAPY IN PATIENTS WITH PULMONARY OBSTRUCTIVE PATHOLOGY-2009
 - Choi, E; Logue, C; Lambert, D; Hardy, K; Thom, S
 - 11 pt's treated, included some patient's with bullous disease.
 - CONCLUSIONS: Xenon ventilation scan may be considered a useful potential screening study to assess risk of PB for patients with pulmonary obstructive pathology undergoing HBOT. Additional information is needed to quantify testing limits for determining HBOT clearance.

