2026 California Thoracic Society Annual Educational Conference

& Chronic Obstructive Pulmonary Disease Symposium

Thursday March 12, 2026-Sunday March 15, 2026

Earn up to 19 CME/CEU/MOC Credits

Jointly Provided by AKH Inc., Advancing Knowledge in Healthcare and the California Thoracic Society

PORTOLA HOTEL & SPA
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Thursday March 12, 2026 (6 CME/CEU/MOC Credits)
COPD Symposium
Friday March 13, 2026 (6.5 CME/CEU/MOC Credits):
Advances in Interventional Pulmonary, Remote Monitoring in Pulmonary and Sleep Medicine, Approach to Symptom Management in Chronic Lung Disease and Critical Care
Saturday March 14, 2026 (6.5 CME/CEU/MOC Credits)
Sepsis and Shock, Extracorporeal Membrane Oxygenation, Inpatient Pulmonary Complications of Cancer Care
Sunday March 15, 2026
Fellow and Resident Track Symposium

California Thoracic Society
ATS Chapter Serving California and Arizona

AKH INC.
ADVANCING KNOWLEDGE IN HEALTHCARE

California Thoracic Society
Annual Conference
March 12-15, 2026
Portola Hotel and Spa, Monterey, CA

Friday March 13, 2026

Advances in Interventional Pulmonary

8:00 am – 8:10 am: Welcome and Introduction

8:10 am – 8:55 am: Keynote Address – Evolution of Bronchoscopy in Diagnosing Lung Nodules

- **Christine Argento, MD (Johns Hopkins) -** This speaker will discuss the recent advances in bronchoscopy from radial EBUS, to electromagnetic navigation, to robot technologies, and how advancement has improved lung nodule diagnosis.

8:55 am – 9:20 am: Implications of the new TNM9 staging for lung cancer

- **Colleen Channick, MD (UC Los Angeles) -** This speaker will discuss the new TNM staging system, how staging is currently performed, and how to approach staging in the patient with suspected lung cancer.

9:20 am – 9:45 am: Management of Central Airway Obstruction

- **Raed Alalawi, MD (Arizona-Phoenix)-** This speaker will discuss how interventional pulmonary practitioners can manage and treat central airway obstruction.

9:45 am – 10:10 am: The Changing Landscape of Pleural Disease Management

- **Joon Chang, MD (Stanford) -** This speaker will discuss advances in management of pleural disease by the interventional pulmonologist including when to use an intrapleural catheter, and when to use

10:10 am – 10:20 am: Question and Answer

10:20 am – 10:50 am: Break

Remote Monitoring in Lung Disease and Sleep Medicine

10:50 am – 11:15 am: Developing a home spirometry program

- **Steven Hays, MD (UC San Francisco) -** This speaker will discuss how to approach the development of a home spirometry program to monitor lung disease, how to use digital health technologies to integrate results into the EHR.

11:15 am – 11:40 am: Home Non-Invasive Ventilator Monitoring

- **Christal Hawkins, RRT (UC San Diego) -** This speaker will review how to monitor home non-invasive ventilators for compliance and for adequate control of sleep disordered breathing.

11:40 am – 11:55 am: Pro: Virtual Pulmonary Rehabilitation is Ready for Prime Time

- **Aimee Kizziar, RRT (UC Davis) -** This speaker will argue in favor of virtual pulmonary rehabilitation programs.

11:55 am – 12:10 pm: Con: Virtual Pulmonary Rehabilitation is not ready for Prime Time

- **Julia Rigler, BA. RRT (UC San Francisco) -** This speaker will argue against virtual pulmonary rehabilitation programs.

12:10 pm – 12:20 pm: Question and Answer

12:20 pm – 1:00 pm: Awards Ceremony

1:00 pm – 2:00 pm: Lunch

Hands On Session:

2:00 pm – 3:00 pm: Robotic Bronchoscopy **Raed Alalawi, MD (Arizona-Phoenix) & Joon Chang, MD (Stanford)** Cough Monitoring **Lauren Eggert, MD (UCSF)**; Endobronchial Ultrasound **Pranjal Patel, MD (Stanford)**; Home NIV **Krystle Leung, MD (Stanford)**

3:00 pm – 3:20 pm: Break

Approach to Symptom Management in the Pulmonary Patient

3:20 pm – 3:45 pm: Addressing the Unmet Needs of Refractory Chronic Cough

- **Krishna Sundar, MD FCCP FAASM ATSF (UC Davis) -** This speaker will discuss the etiology behind refractory chronic cough and the treatment approaches for management

3:45 pm – 4:10 pm: Frailty in Pulmonary and Critical Care Medicine

- **Jonathan Singer, MD MPH (UC San Francisco) -** This speaker will discuss the concept of frailty and how it impacts health in patients with lung disease. The speaker will also discuss how frailty can change as lung disease is treated.

4:10 pm – 4:35 pm: Palliative Care for the Patient with Chronic Lung Disease

- **Grace Amadi, MD (UC Davis) -** This speaker will discuss how palliative care teams can benefit patients with chronic various lung disease including ILD, COPD, and pulmonary hypertension.

4:35 pm – 5:00 pm: Palliative Care for the Patient with Critical Illness

- **B. Corbett Walsh, MD, MBE (UC Los Angeles) -** This speaker will discuss how palliative care teams can benefit the inpatient with advancing lung disease, the importance of advance care planning, and palliative care in the intensive care unit.

5:00 pm – 5:10 pm: Question and Answer

5:30 pm – 7:00 pm: Women in Pulmonary, Critical Care, and Sleep Medicine (NON-CME) – Food and beverages will be served

Dr. Joon Chang received his medical degree from UCLA David Geffen school of medicine. He did her post-graduate medicine residency at NYU and pulmonary and critical care fellowship at Stanford. He completed his interventional pulmonology fellowship at the Hospital of University of Pennsylvania in 2022. Currently, he serves as an Assistant Professor of Medicine at Stanford and a member of interventional pulmonology group at Stanford.

The Changing Landscape of Pleural Disease Management

Joon Chang, MD

Stanford University

Disclosures

- I have the following relationships with ACCME defined ineligible companies:

Intuitive Surgical

PulmonX

- I **WILL NOT** discuss off-label use and/or investigational use of any drugs or devices.

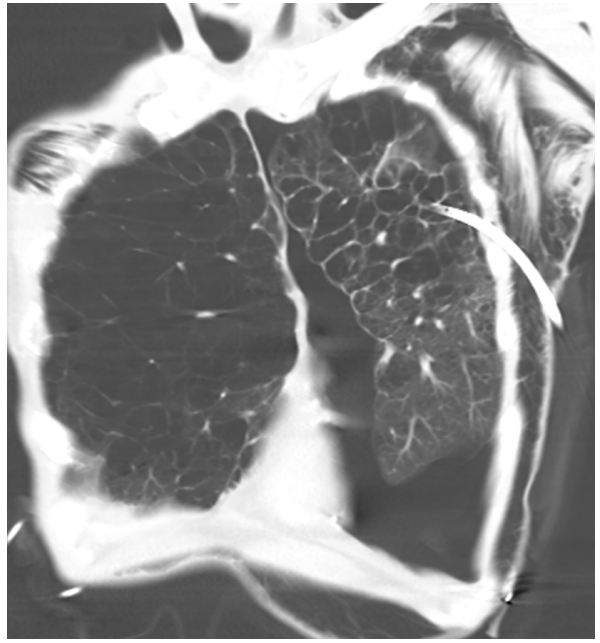
What Has Changed?

- Routine thoracic ultrasound at bedside and clinic
- Early risk stratification for infected pleural space
- Algorithm for malignant pleural effusion
- Proactive pulmonology and critical care providers!

Ultrasound is the Standard of Care

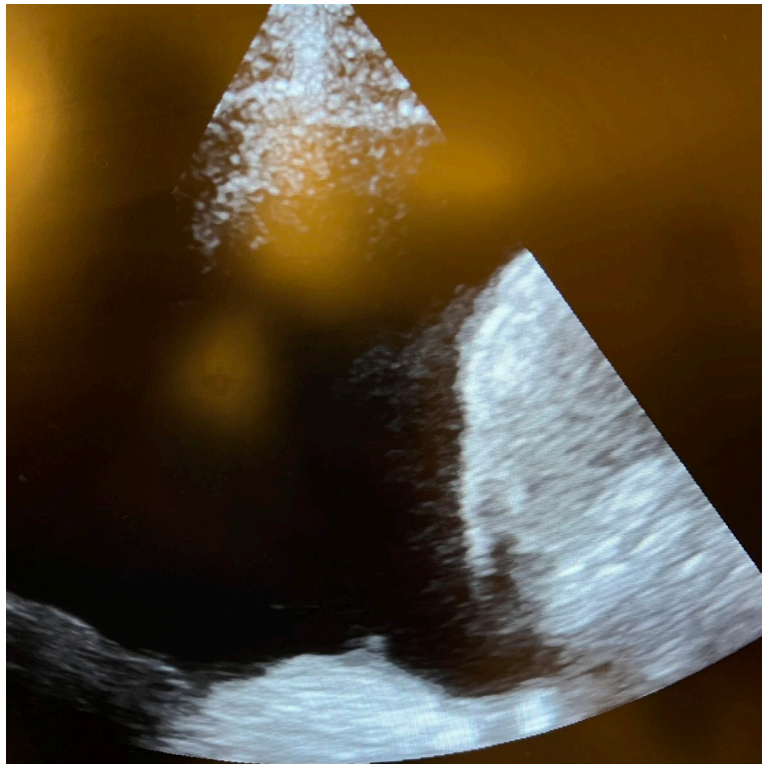
- Ultrasound-first pleural evaluation

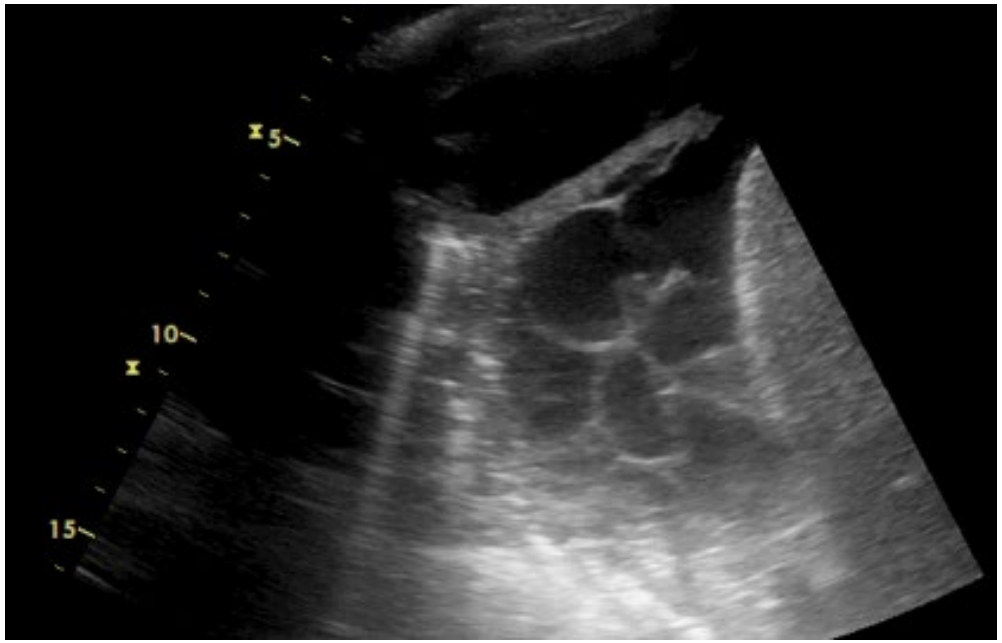
- BTS
  - “Thoracic ultrasound should be performed on every patient at their initial presentation and again whenever a pleural procedure is being performed.”



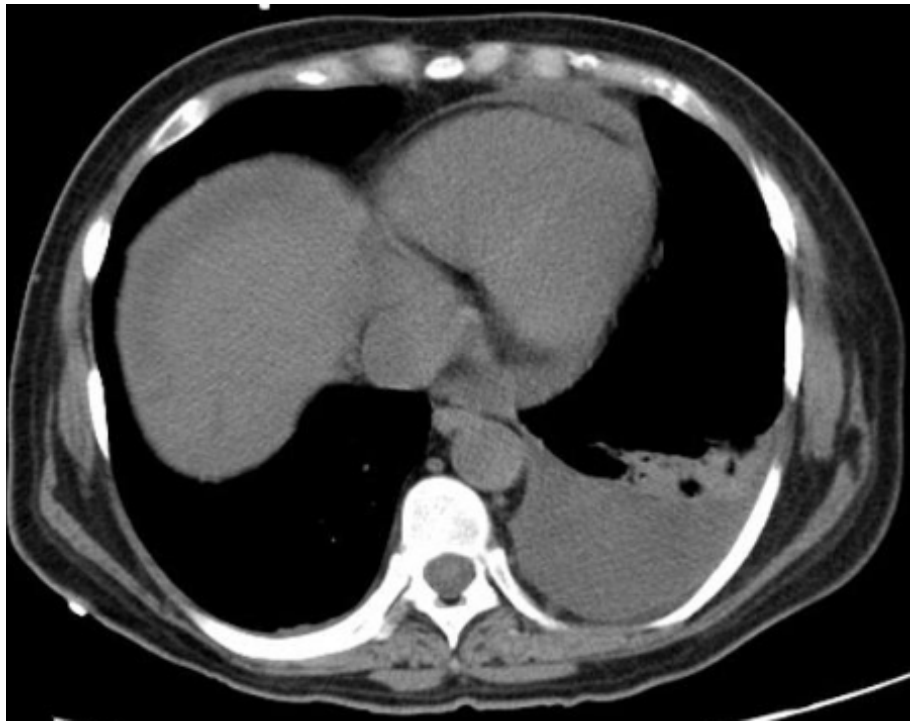
Thorax. 2023 Jul;78(Suppl 3):s1-s42.

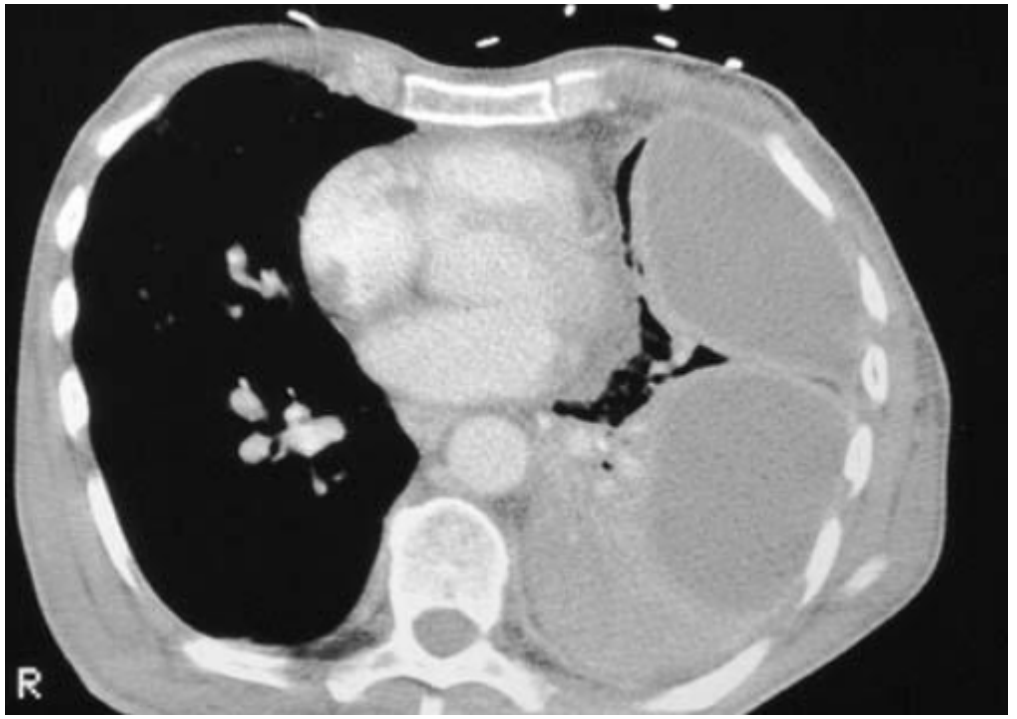
Different Approach?





Different Approach?





Pleural Effusions: The Diagnostic Separation of Transudates and Exudates

RICHARD W. LIGHT, M.D., M. ISABELLE MACGREGOR, M.D.,
PETER C. LUCHSINGER, M.D., F.A.C.P., and WILMOT C. BALL, JR., M.D.,
Baltimore, Maryland

Criteria	Exudative if
Pleural Fluid Protein / Serum Protein Ratio	> 0.5
Pleural Fluid LDH / Serum LDH Ratio	> 0.6
Pleural Fluid LDH Level	> 2/3 the upper limit of the lab's normal serum LDH

- Good starting point to separate transudates from exudates
- Sensitivity 97%; specificity 85%

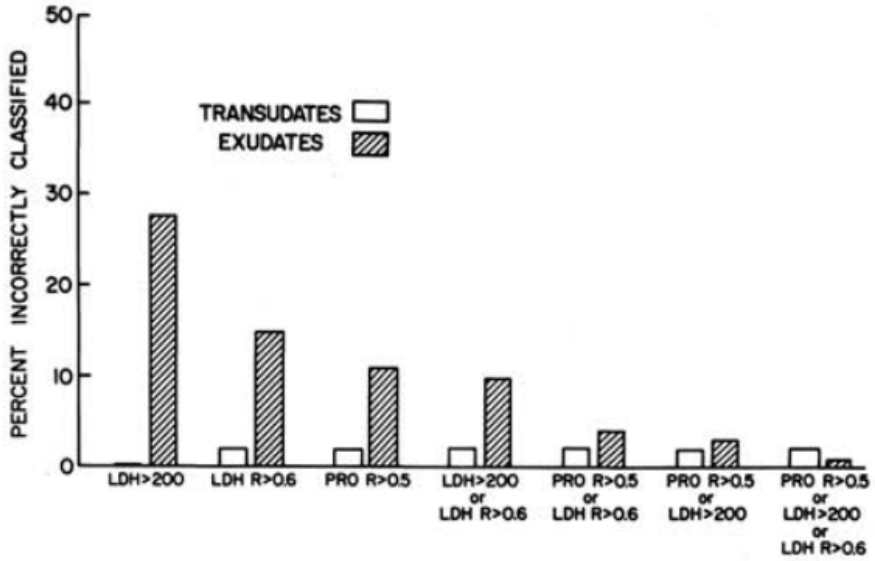
Light et al. Ann Intern Med. 1972.

Review > Clin Chest Med. 2013 Mar;34(1):21-6. doi: 10.1016/j.ccm.2012.11.006.
Epub 2013 Jan 17.

The Light criteria: the beginning and why they are useful 40 years later

Richard W Light [1]

- Light's criteria misclassify 25% of transudates as exudates



Criteria	Threshold	Interpretation
Serum-Pleural Fluid Protein Gradient	> 3.1 g/dL	Suggests **Transudate**
Serum-Pleural Fluid Albumin Gradient	> 1.2 g/dL	Suggests **Transudate**
Pleural Fluid NT-proBNP	> 1300 pg/mL	Suggests **Transudate** due to heart failure

Light et al. Ann Intern Med. 1972.
Light. Clin Chest Med. 2013.

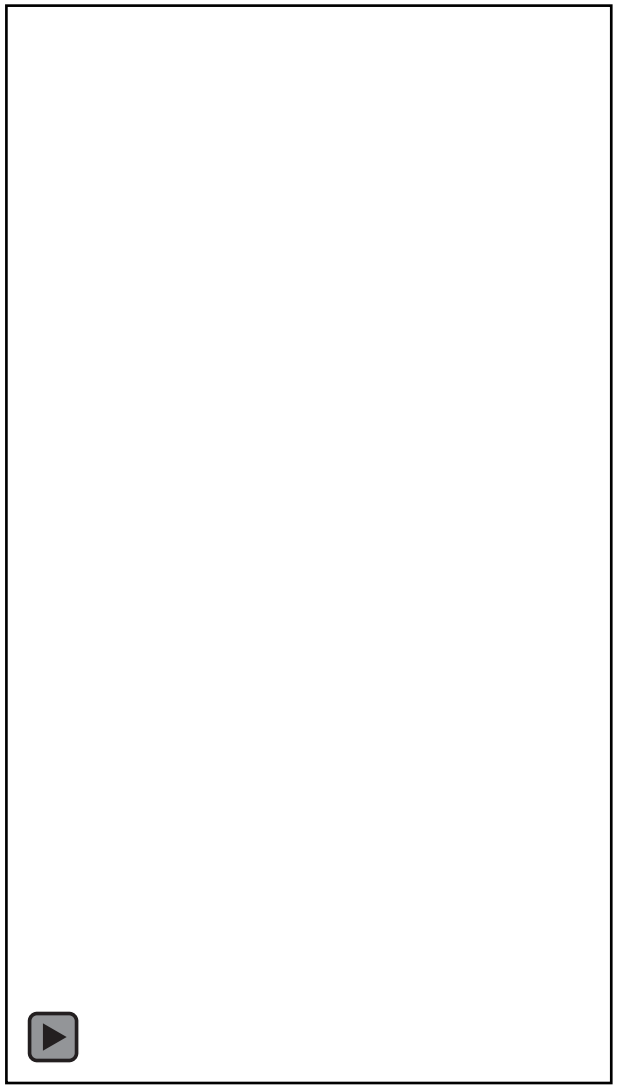
Thoracentesis or Chest tube?

Send the following tests from fluid:

- LDH, protein, glucose, pH, cell count, gram stain/culture

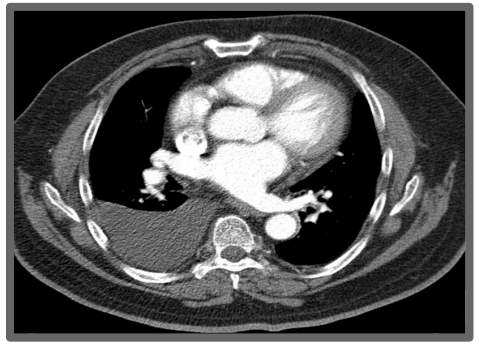
Drain with chest tube if **any** of the following is present:

1. Frank pus/positive gram stain
2. Pleural fluid ≤ 7.20
3. Glucose < 60 mg/dL
4. Loculated effusion or large effusion with respiratory compromise*



Thorax. 2023 Jul;78(Suppl 3):s1-s42.

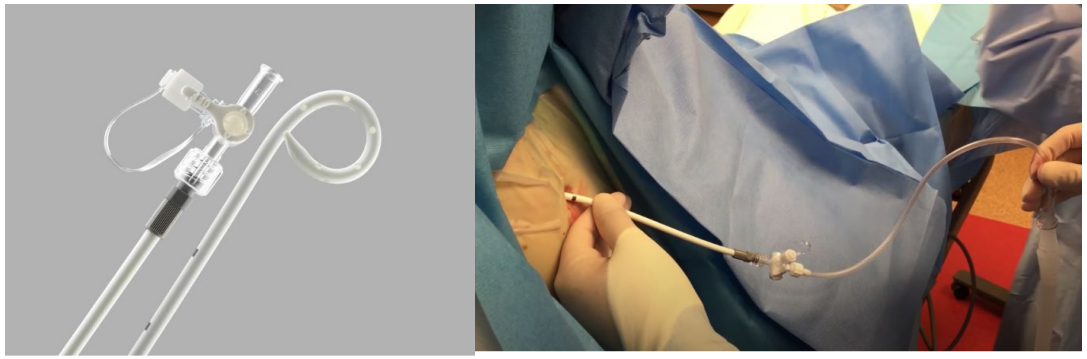
Spectrum of Infection



PATHOPHYSIOLOGY		CLINICAL APPEARANCES	BIOCHEMISTRY	MICROBIOLOGY	TREATMENT
PLEURAL INJURY Early inflammation Neutrophil chemotaxis Increased vascular and pleural permeability (mediated by cytokines, e.g. VEGF) Increasing fluid accumulation	EXUDATIVE PHASE	**SIMPLE PARAPNEUMONIC EFFUSION** Free-flowing fluid	pH > 7.20 GLUCOSE > 60 mg/L LDH < 1000 IU/L	NO ORGANISMS PRESENT	SURGERY FIBRINOLYTICS FLUID DRAINAGE (simple effusions may need draining if large) NUTRITIONAL SUPPLEMENTS ANTIBIOTICS THROMBOPROPHYLAXIS (if inpatient)
ONGOING INFLAMMATION AND BACTERIAL TRANSLOCATION (mediated by cytokines, e.g. IL-8, TNF-α, TGF-β) Activation of coagulation cascade Increasing pleural fibrin deposition and fibrin remodelling Down-regulation of local fibrinolytic pathways	FIBRINOPURULENT PHASE	**COMPLICATED PARAPNEUMONIC EFFUSION** Increasingly turbid fluid +/- fibrinous septations and loculations	pH < 7.20 GLUCOSE < 60 mg/L LDH > 1000 IU/L	ORGANISMS POSSIBLY FOUND	
BUILD-UP OF BACTERIAL AND INFLAMMATORY CELL DEBRIS Fibroblast chemotaxis Development of fibrosis Formation of complex, organized pleural peel	ORGANISING PHASE	**EMPYEMA** Pus			

Clin Chest Med. 2013 Mar;34(1):47-62.

Bigger is not always better



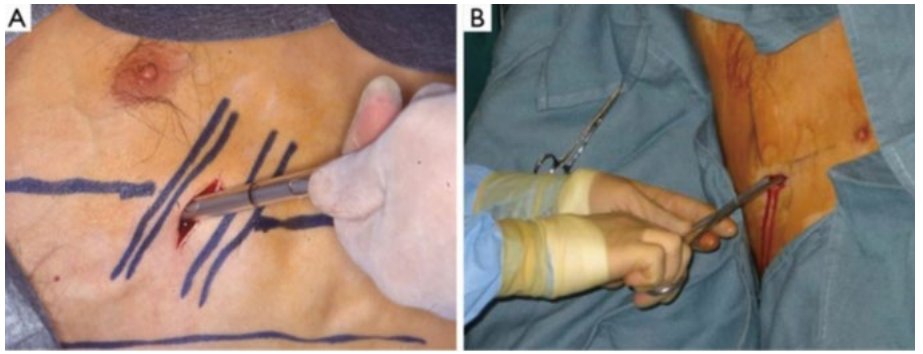


Image guided small bore (10-14Fr) catheter preferred

THORACIC ONCOLOGY: ORIGINAL RESEARCH · Volume 160, Issue 5, P1875-1889, November 2021 Download Full Issue

Safety of Thoracentesis and Tube Thoracostomy in Patients With Uncorrected Coagulopathy

A Systematic Review and Meta-analysis

TABLE 3] Subgroup Analyses of Bleeding Complications

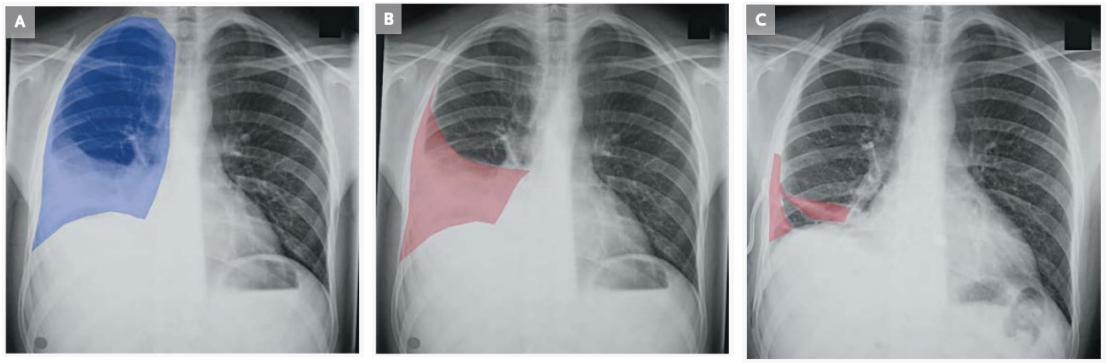
Subgroup	No. of Studies	Pooled Results of Major Bleeding Complication Rates (95% CI)	I^2, %	*P* Value for Test of Heterogeneity	*P* Value for Egger's Test
Drug-related risks only	6	0 (0%-0%)	0.00	.59	.449
Thrombocytopenic risk only	1	0 (0%-9%)	NA	NA	NA
Elevated INR risk only	1	0 (0%-5%)	NA	NA	NA
Tube thoracostomy only	3	0 (0%-2%)	0.00	.97	NA
Thoracentesis only	13	0 (0%-1%)	85.16	.00	.526
Retrospective studies only	13	0 (0%-1%)	83.78	.00	.728
Prospective studies only	5	0 (0%-1%)	66.10	.02	.281

INR = international normalized ratio; NA = not applicable.

- Research question: Is it safe to perform thoracentesis and tube thoracostomy in patients with uncorrected coagulopathy?
- 18 studies (5134 procedures)
- Pooled major bleeding and mortality rates of 0% (95% CI, 0%-1%)

Fong et al. Chest 2021

Intrapleural tPA/DNase: MIST 2



ORIGINAL ARTICLE

Intrapleural Use of Tissue Plasminogen Activator and DNase in Pleural Infection

Najib M. Rahman, D.Phil., Nicholas A. Maskell, D.M., Alex West, M.R.C.P., Richard Teoh, M.R.C.P., Anthony Arnold, M.R.C.P., Carolyn Mackinlay, M.R.C.P., Daniel Peckham, M.D., Chris W.H. Davies, M.D., Nabeel Ali, M.D., William Kinnear, M.D., Andrew Bentley, M.D., Brennan C. Kahan, M.Sc., John M. Wrightson, M.R.C.P., Helen E. Davies, M.R.C.P., Clare E. Hooper, M.R.C.P., Y.C. Gary Lee, Ph.D., Emma L. Hedley, Nicky Crosthwaite, R.G.N., Louise Choo, M.Sc., Emma J. Helm, F.R.C.R., Fergus V. Gleeson, M.D., Andrew J. Nunn, M.Sc., and Robert J.O. Davies, M.D.*

- **Loculated complicated parapneumonic effusion/empyema with inadequate drainage**
- tPA: breaks fibrin septation; DNase: reduces viscosity (DNA in pus)
- Outcomes:
  - Significant reduction of x-ray opacity at day 7
  - 77% reduction of need for surgery at 3 months vs. placebo
  - 6.7 day reduction in hospital stay vs. placebo

Rahman NM et al. MIST2, NEJM 2011

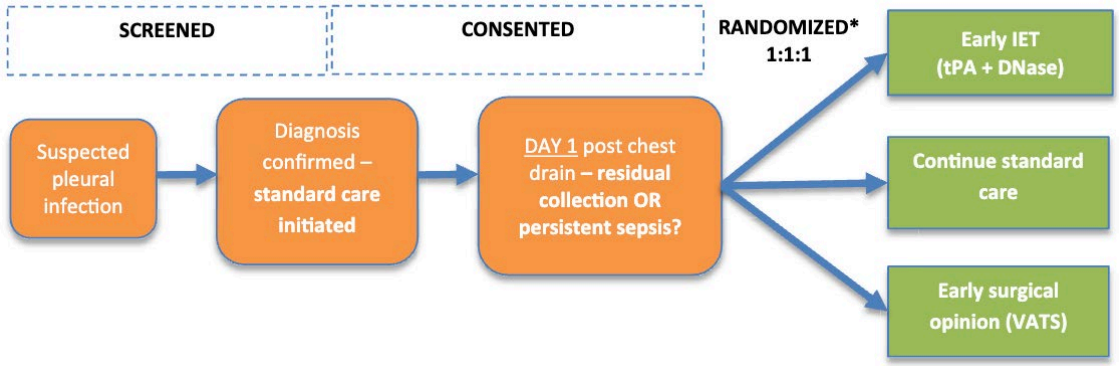
tPA/DNase: Common Regimen

- Combination of intrapleural fibrinolytic + DNase (not single agents)
- Recommend regime tPA 10 mg + DNase 5 mg therapy twice daily
- Number of doses individualized based on clinical, radiographic and inflammatory marker responses
- Correct coagulopathy and withhold anticoagulants during therapy, if possible
- 1st line before surgery in fibropurulent cases

Chaddha U, Lancet Resp Med. 2021
Akulian, et al. Chest. 2022.

ORIGINAL ARTICLE

Early Video-assisted Thoracoscopic Surgery or Intrapleural Enzyme Therapy in Pleural Infection: A Feasibility Randomized Controlled Trial. The Third Multicenter Intrapleural Sepsis Trial—MIST-3



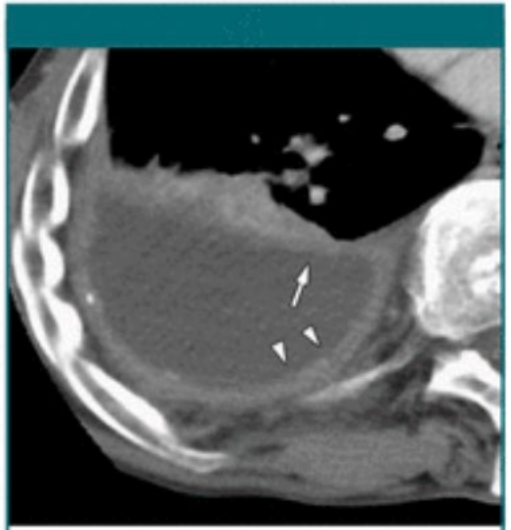
- Prospective, multicenter (UK) randomized controlled trial. N = 60
- **Chest tube and antibiotics vs. early tPA+DNase vs. early VATS**
- Similar LOS (7 days for intervention vs. 10 days for standard care)
- Improved Euro-QoL score in early IET compared to early surgical

Bedawi et al. Am J Respir Crit Care Med 2023

When to involve thoracic surgery

Consider thoracic surgery consult if:

- Persistent sepsis + residual collection despite appropriate tube positioning
- Failure/contraindication to tPA/DNase
- Organized phase with thick peel / trapped lung physiology
- Bronchopleural fistula or complex pleural space anatomy
- Rapid clinical deterioration



Contrast-enhanced transverse CT scan shows empyema between thickened parietal (arrowheads) and visceral (arrow) pleural layers: the split pleura sign.

Shen KR, Bribriesco A, Crabtree T, et al. J Thorac Cardiovasc Surg. 2017.

Next MIST we are waiting on…

https://www.nytimes.com/

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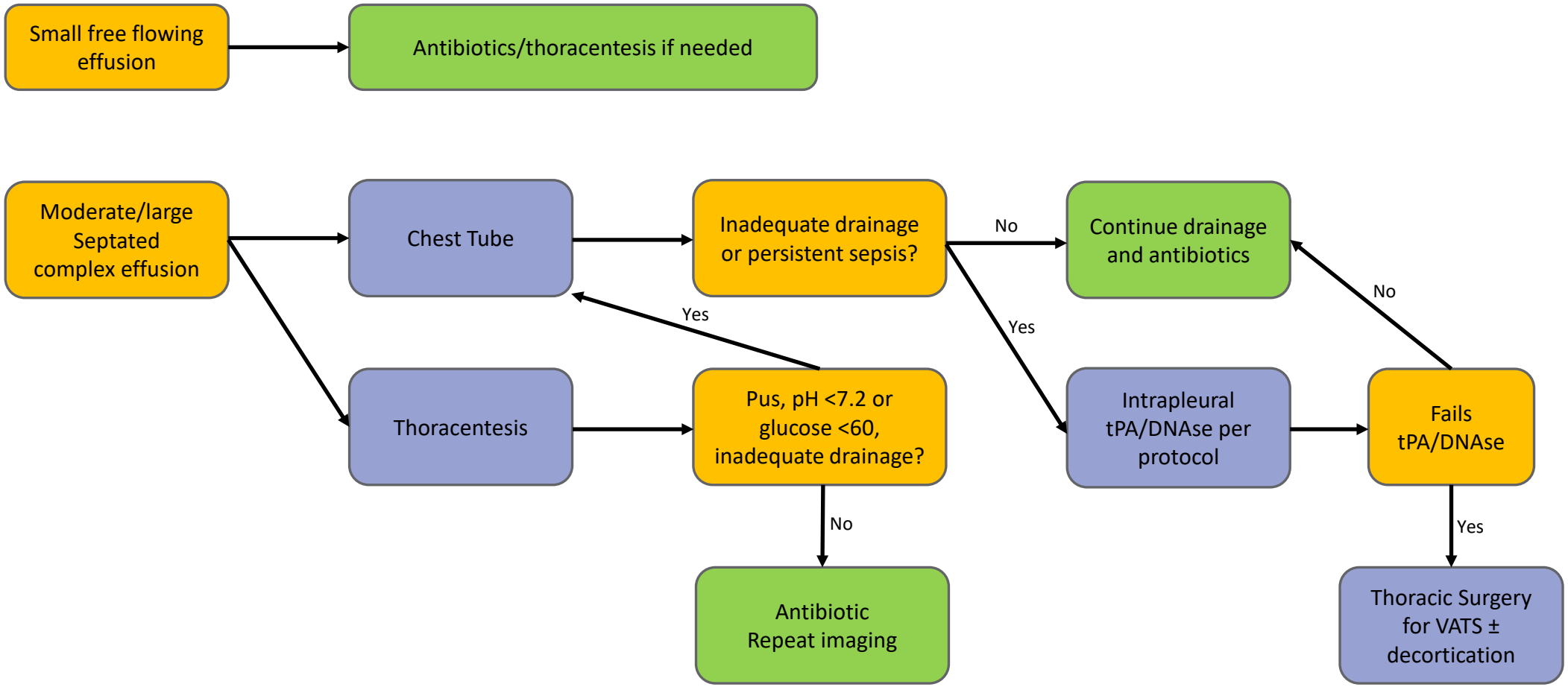
Algorithm for Infected Pleural Fluid

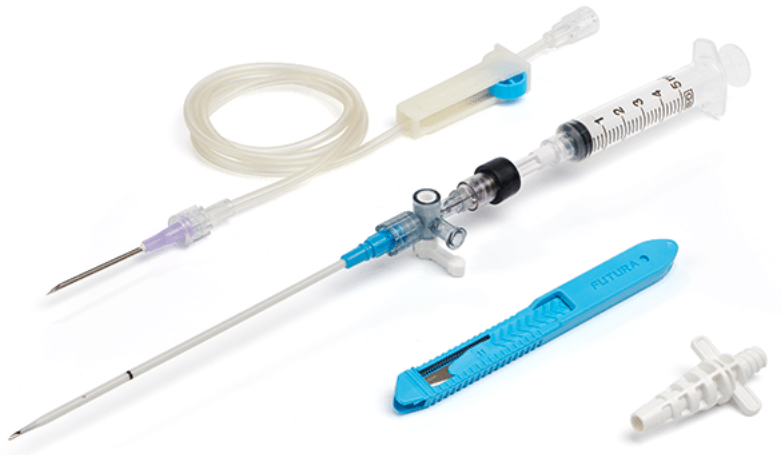


Malignant Pleural Effusion (MPE): Goals and First Step

Goal: Symptomatic relief with **better quality of life**, **minimize hospital time**

First step for most patients: therapeutic thoracentesis

- Confirm symptomatic benefit
- Send fluid studies
- Assess lung expandability



Bhatnagar R, Maskell N. Indwelling pleural catheters. Respiration. 2014;88:74-85.

Definitive Options

1. Indwelling Pleural Catheter (IPC/TPC)

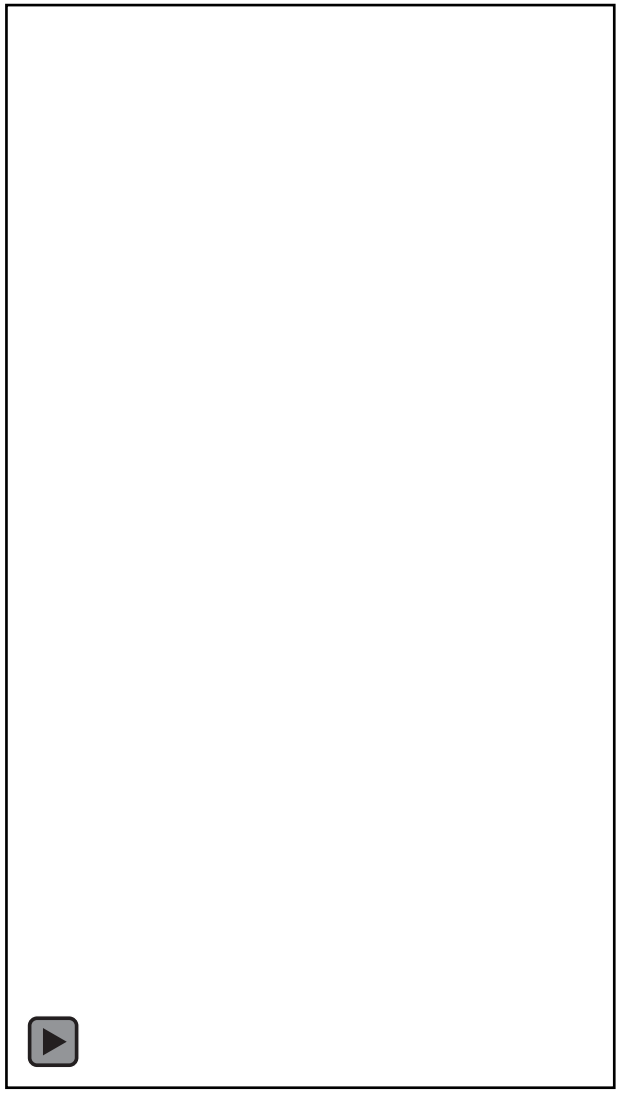
- Outpatient placement; immediate symptom control; can lead to autopleurodesis

2. Pleurodesis (talc slurry via tube or thoracoscopic poudrage)

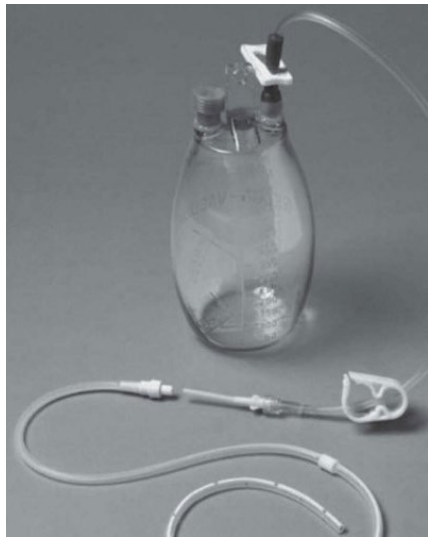
- Best with expandable lung

3. Serial thoracenteses

- Slow recurrence, very limited prognosis, preferences



Expandable vs. Non-expandable Lung



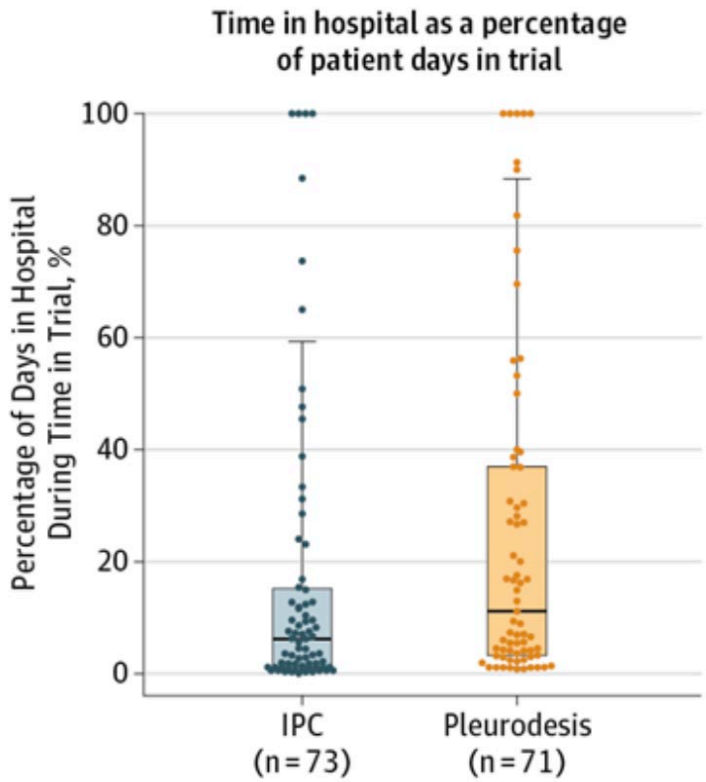
- Symptoms don't improve despite fluid removal
- Pleurodesis requires apposition-> does not work for trapped lung
- **Indwelling pleural catheter** is preferred for symptom control in trapped lung

Bhatnagar R, Maskell N. Indwelling pleural catheters. Respiration. 2014;88:74-85.

Indwelling Pleural Catheter vs Talc

Effect of an Indwelling Pleural Catheter vs Talc Pleurodesis on Hospitalization Days in Patients With Malignant Pleural Effusion
The AMPLE Randomized Clinical Trial

- IPC with fewer total hospitalization days compared to talc pleurodesis (median 10 vs 12 days)
- IPC reduced proportion of remaining life spent in hospital (median 6.2% vs 11.1%)
- No significant difference in breathlessness, QoL



Thomas et al. JAMA 2017

IPC Drainage Frequency

ORIGINAL ARTICLE

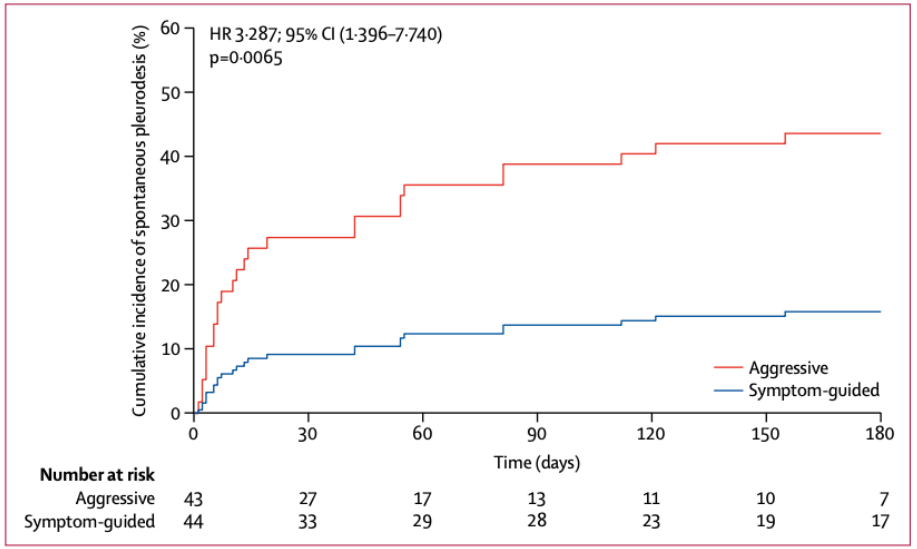
Randomized Trial of Pleural Fluid Drainage Frequency in Patients with Malignant Pleural Effusions
The ASAP Trial

- Daily drainage with higher rates of spontaneous pleurodesis (47% vs 24%)
- Daily drainage with shorter time to pleurodesis (54 days vs 90 days)

ARTICLES · Volume 6, Issue 9, P671-680, September 2018 Download Full Issue

Aggressive versus symptom-guided drainage of malignant pleural effusion via indwelling pleural catheters (AMPLE-2): an open-label randomised trial

- Similar breathlessness control over 60 days
- Daily drainage with higher rates of spontaneous pleurodesis and better QoL scores



Muruganandan et al. Lancet Respir Med 2018
Wahidi et al. Am J Respir Crit Care Med 2017

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ORIGINAL INVESTIGATION

Rapid Pleurodesis in Patients With Chronic Noninfectious Pleural Effusion

Twenty Years of Real-world Performance Data

Pu, Chan Yeu MD, MS[*,†]; Avendano, Camilo A. MD[*]; Durant, Makayla MS[*]; Ospina-Delgado, Daniel MD[*,‡]; Burbano, Alma V. MD[*]; Swenson, Kai E. MD[*]; Beattie, Jason MD[*]; Parikh, Mihir MD[*]; Majid, Adnan MD[*]

- Medical thoracoscopy, pleural biopsy, sclerosing agent (talc), indwelling pleural catheter
- Single-center, retrospective. N = 210 (72% MPE, 28% benign)
- 84% achieved pleurodesis with median 12 days
- Median hospital stay 4 days

Pu et al. J Bronchology Interv Pulmonol. 2024.

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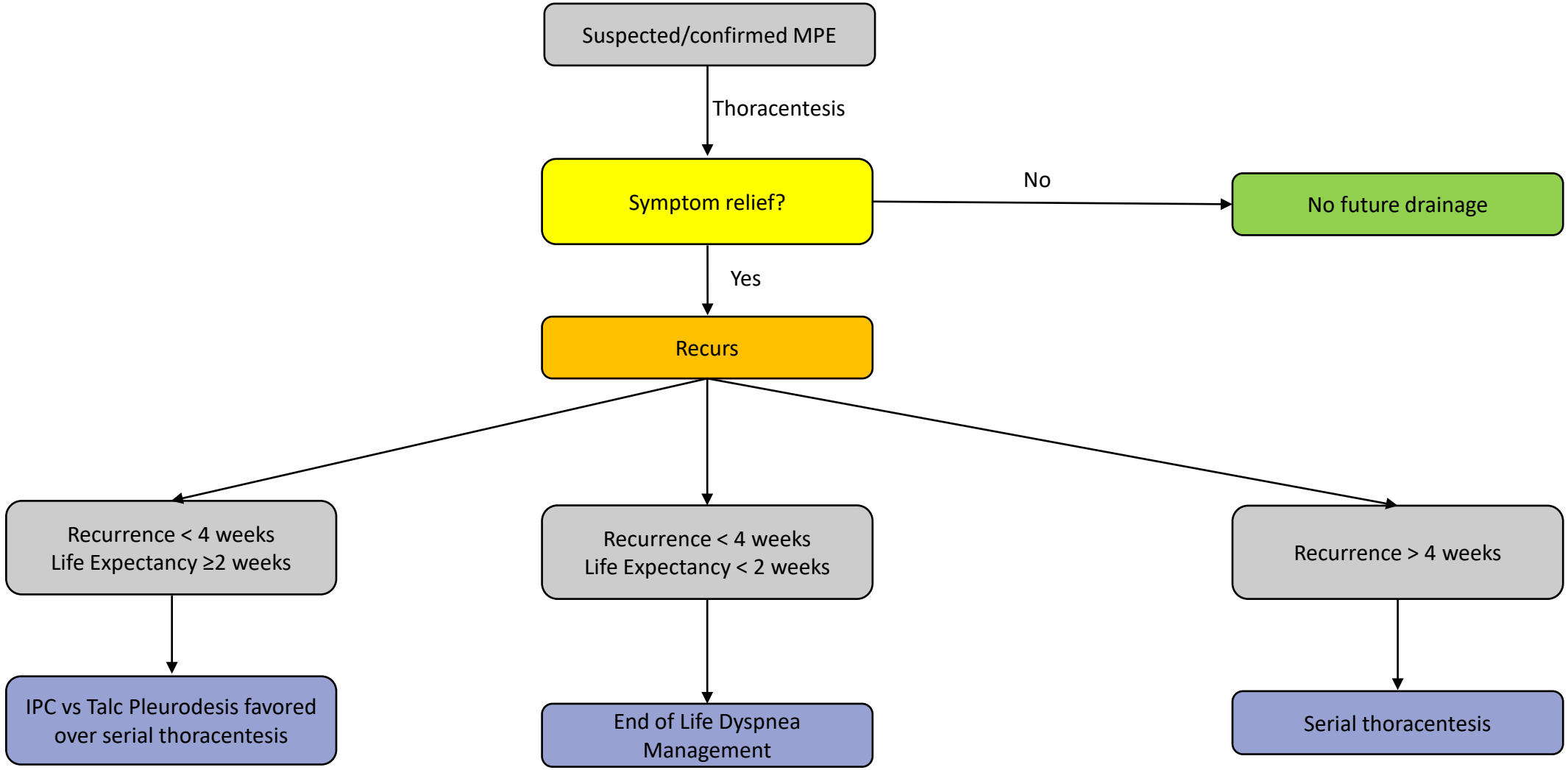
Algorithm for MPE Management



Adapted from Dr. Pranjal Patel
Penz et al. Cancer Manag Res. 2017.

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Key Takeaways

- **Ultrasound-first** assessment guides everything (complexity, loculations, safest access).

- Parapneumonic effusion/empyema: small bore chest tube if **pus/culture+** or **pH ≤7.2** (or strong supportive features) and escalate at **24–48h** if not improving.

- If not improving and loculated: **tPA/DNase** per protocol. Involve surgery early when failing.

- MPE: start with thoracentesis to assess **benefit + expandability**; IPC is first-line for many, mandatory for trapped lung; pleurodesis for selected expandable-lung patients.

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Thank You!

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