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# Outcomes of lytic therapy on empyema and loculated pleural effusion

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## Introduction and Objective

- Pleural effusions are the collection of fluid in the pleural cavity of the lungs while empyema's are a collection of pus in the pleural cavity of the lungs.
  - Pleural Effusions and Empyema are most frequently caused by pneumonia.<sup>3</sup>
  - Other causes include trauma, bacteria, viruses, infection, etc.
  - Loculated pleural effusions are more difficult to drain because of the formation of fibrin clot and membrane deposition.
  - Pleural effusions that are not loculated can be drained by thoracentesis or chest tube placement alone.
- Lytic Therapy is a bedside treatment using alteplase (10mg/30 mL saline) dornase (5mg/20 mL water) injected through the chest tube to promote breakdown of fibrin adhesions.
  - Commonly used to avoid surgical interventions and reduce hospital stays.
- Objective
  - Evaluate the effectiveness of lytic therapy on empyema and pleural effusions based on cohort factors.

## Methods

RedCap

- Database of 200 patient records.
- Includes patient demographics and details of procedure outcome.

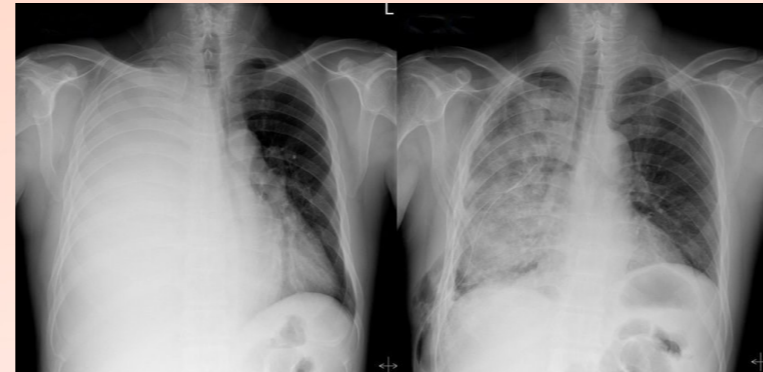
Epic

- Chart Review of patients from 2017-2022 across three LVHN campuses (Muhlenberg, Cedar Crest, and Pocono).
- All received lytic therapy for empyema or pleural effusions.

Excel

- Used to compile data from redcap into graphs.
- Statistical analysis of the success rates based on patient details.

## Results



Success of lytic therapy was determined by CXR. The CXR on the left shows a patient with a massive pleural effusion of the right lung. The CXR on the right shows improvement in the pleural effusion after chest tube drainage. This patient had successful treatment. Any patient's CXR that showed any signs of improvement was recorded as successful.

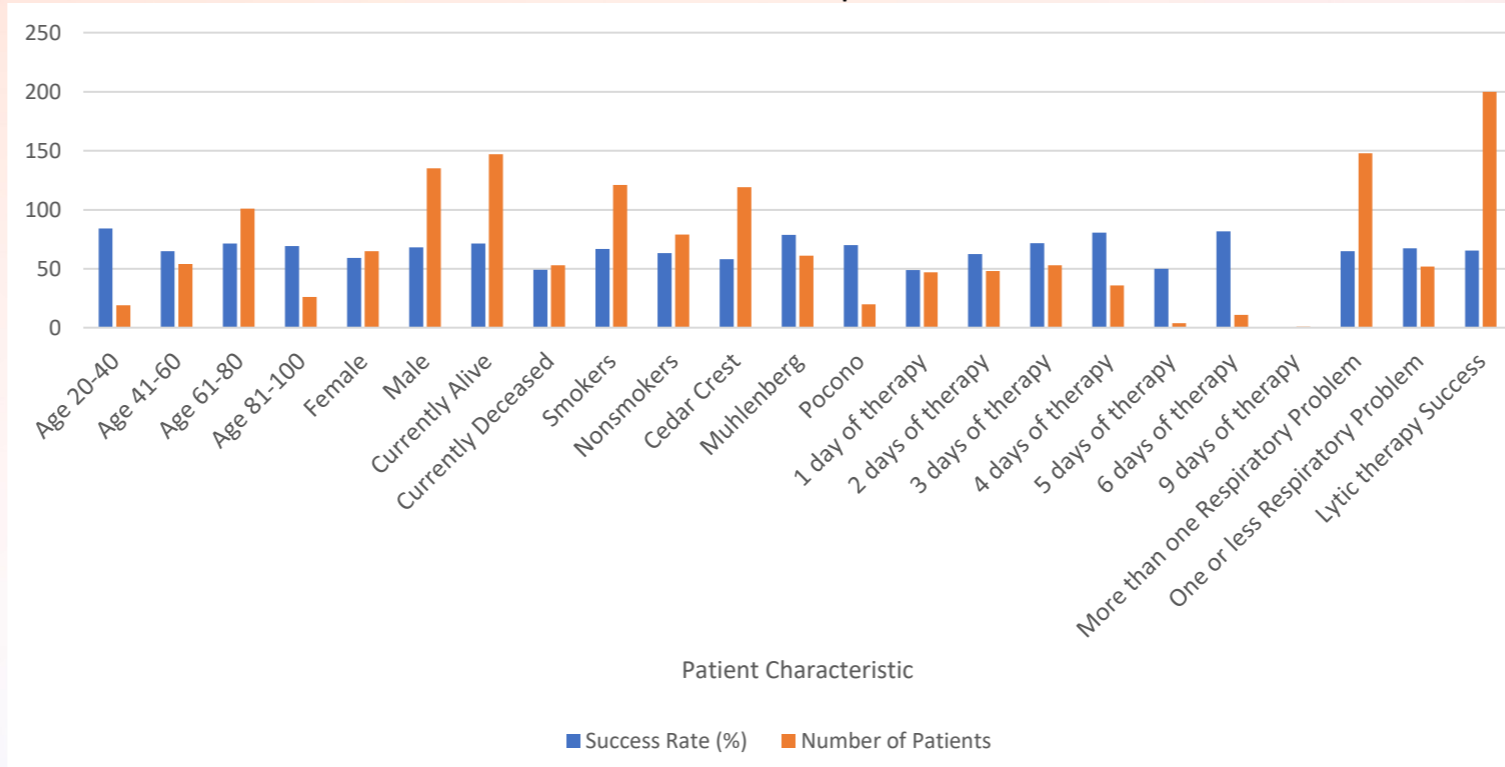


Figure 1 The graph evaluates the success rate of lytic therapy based on the characteristics and number of patients.

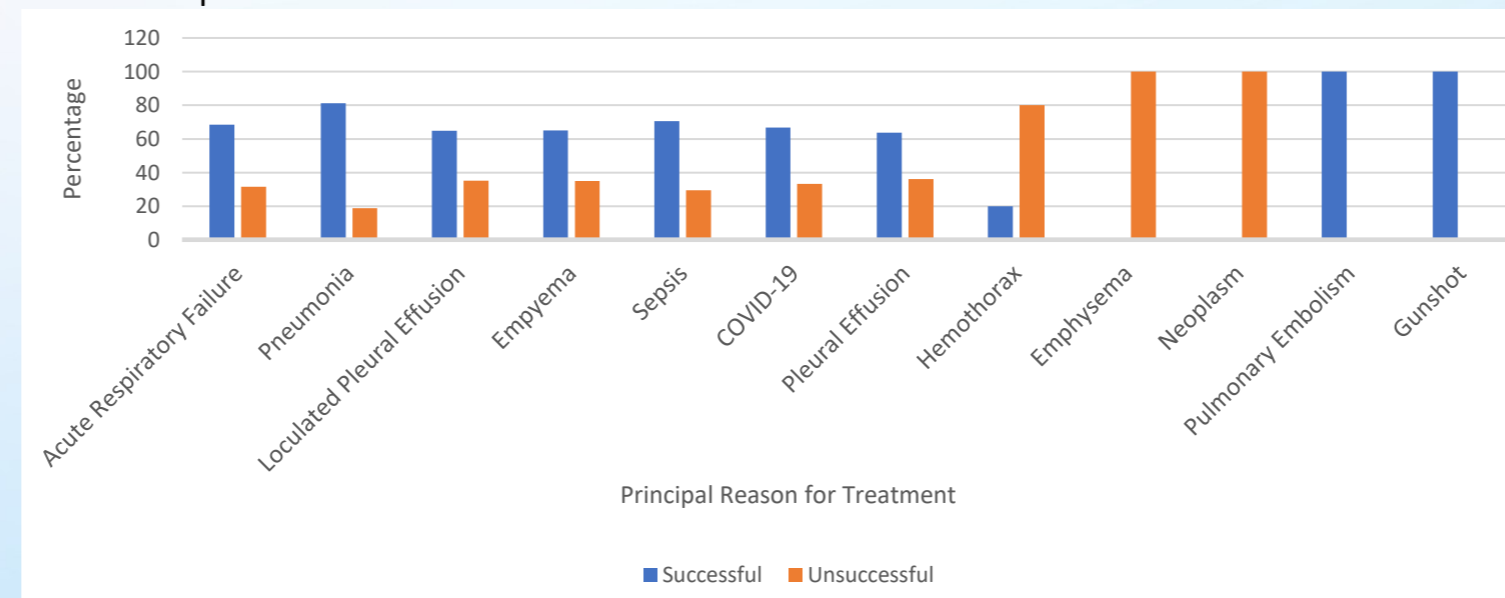


Figure 2 The graph compares the principal reason lytic therapy treatment was given to the percentage of how successful or unsuccessful the therapy was for the patients.

## Conclusions

- Lytic therapy had a 65.5% success rate among the 200 patients with 94.5% having no complications. Based on the data lytic therapy is a successful treatment and alternative to surgical procedures for the treatment of empyema and pleural effusion.
  - Patients should receive 3, 4, or 6 days of lytic therapy as it produces the highest success rate.
  - Patients who are smokers or have a certain number of respiratory problems do not show any statistical importance on the success of the therapy.
- Of the 69 patients who did not improve with lytic therapy, 29% received surgery.
  - The success of the surgery was not evaluated in this project.
- The low success rate for patient's who are currently dead suggest there were underlying medical issues that may have hindered the treatment. This is a factor that may be addressed in the future of this project.

## Future Directions

### Medical History

- Explore deeper into the medical history of these patients, particularly problems other than related to the respiratory system.

### Protocol for Lytic Therapy

- This study shows that patient's who received more consistent doses had the most successful results. Therefore, a more standardized administration protocol should be ensured.

## References

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