

EVALI: Unraveling the E-cigarette or Vaping Product Use-Associated Lung Injury

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Acknowledgement of Country

I would like to begin by acknowledging the Traditional Owners of the land on which we meet today. We also pay our respects to Elders past and present, recognizing their continuing connection to the land, waters, and culture.



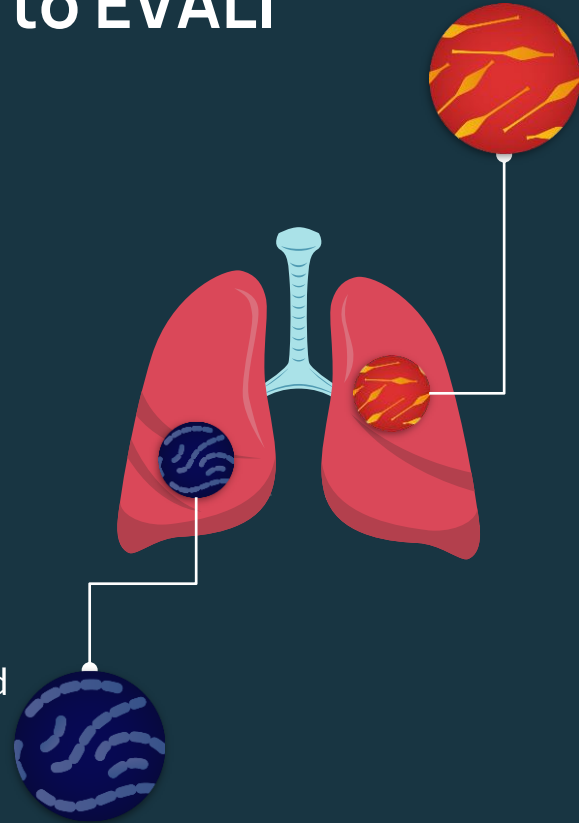
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Introduction to EVALI

- Severe lung injury associated with the use of e-cigarettes or vaping products.
- Presents as an acute or subacute respiratory illness with nonspecific symptoms and lab findings.
- Identified in 2019 during an EVALI epidemic.
- Importance of the topic: Health implications and public awareness



The 2019 EVALI Outbreak

2,807

Reported Cases

68

Fatalities

Identification of potential
culprits

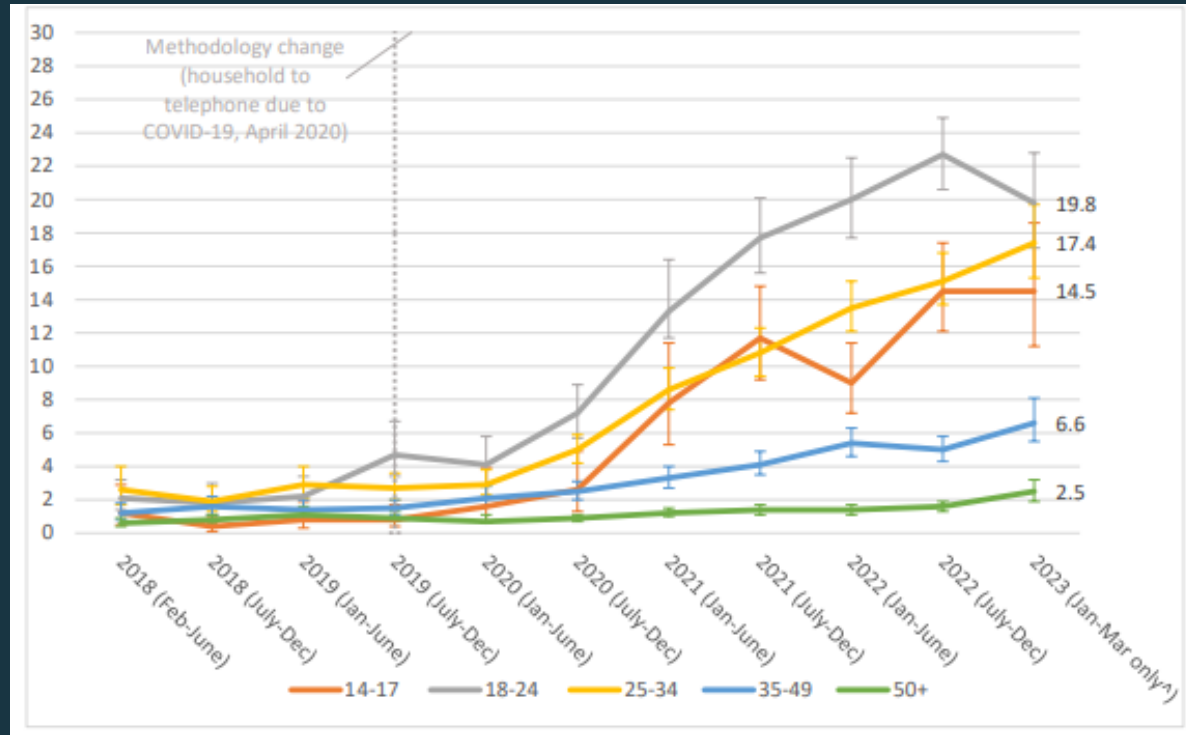
Investigation

Vitamin E acetate

Culprit

Australian statistics

Six-monthly prevalence of current vaping by age group, 2018 to 2023 (weighted %).



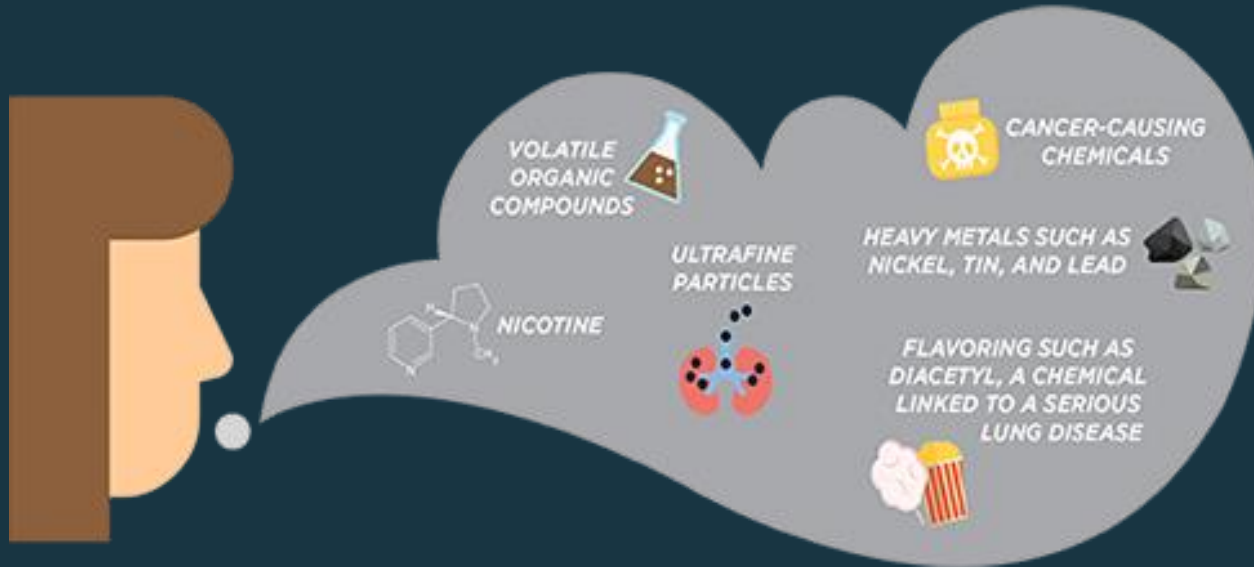
Causes and Risk Factors

EVALI is caused by harmful chemicals, additives, and contaminants found in vaping products.

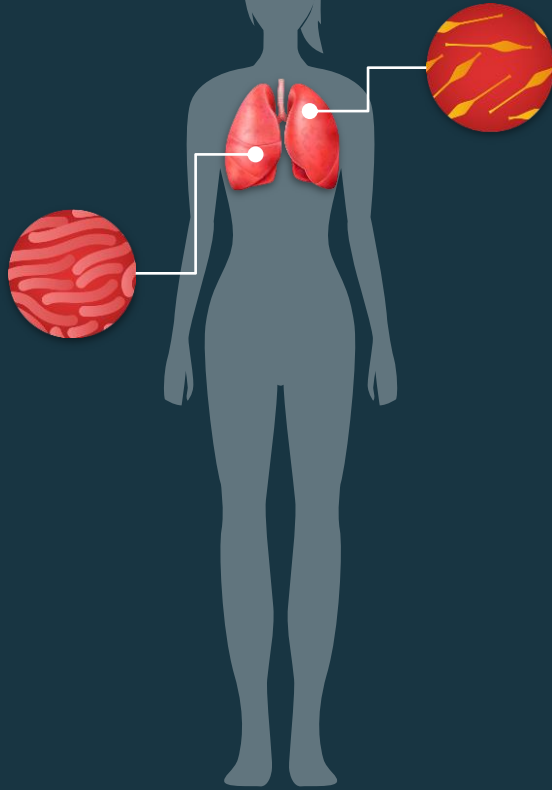
PRIMARY LINK:

Vitamin E acetate, used in THC-containing vaping products

Risk factors for EVALI include the product source, e-liquid ingredients, usage patterns and younger individuals



Pathophysiology of EVALI



- Exact pathophysiology is unclear
- Research on EVALI is ongoing
- Varies among individuals
- Influenced by the specific substances vaped, individual susceptibility, and other factors.

Pathophysiology of EVALI

Inhalation Process

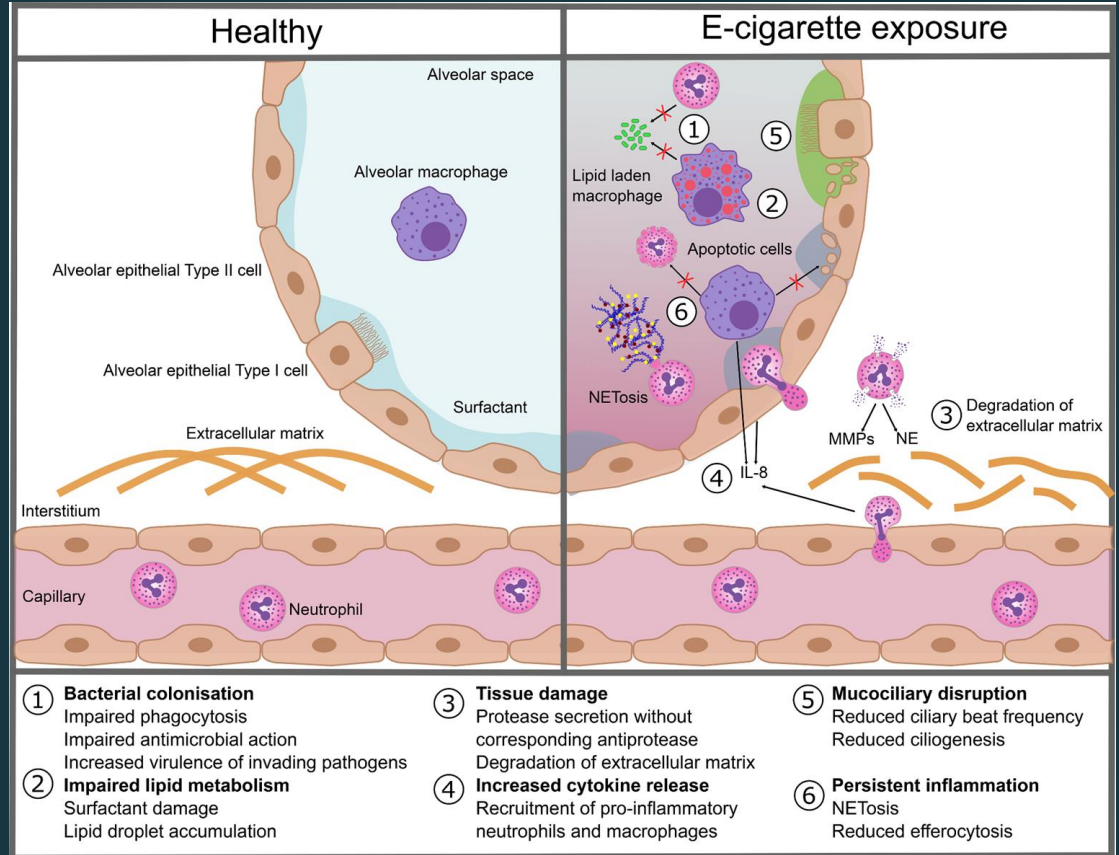
Inflammatory Response

Oxidative Stress

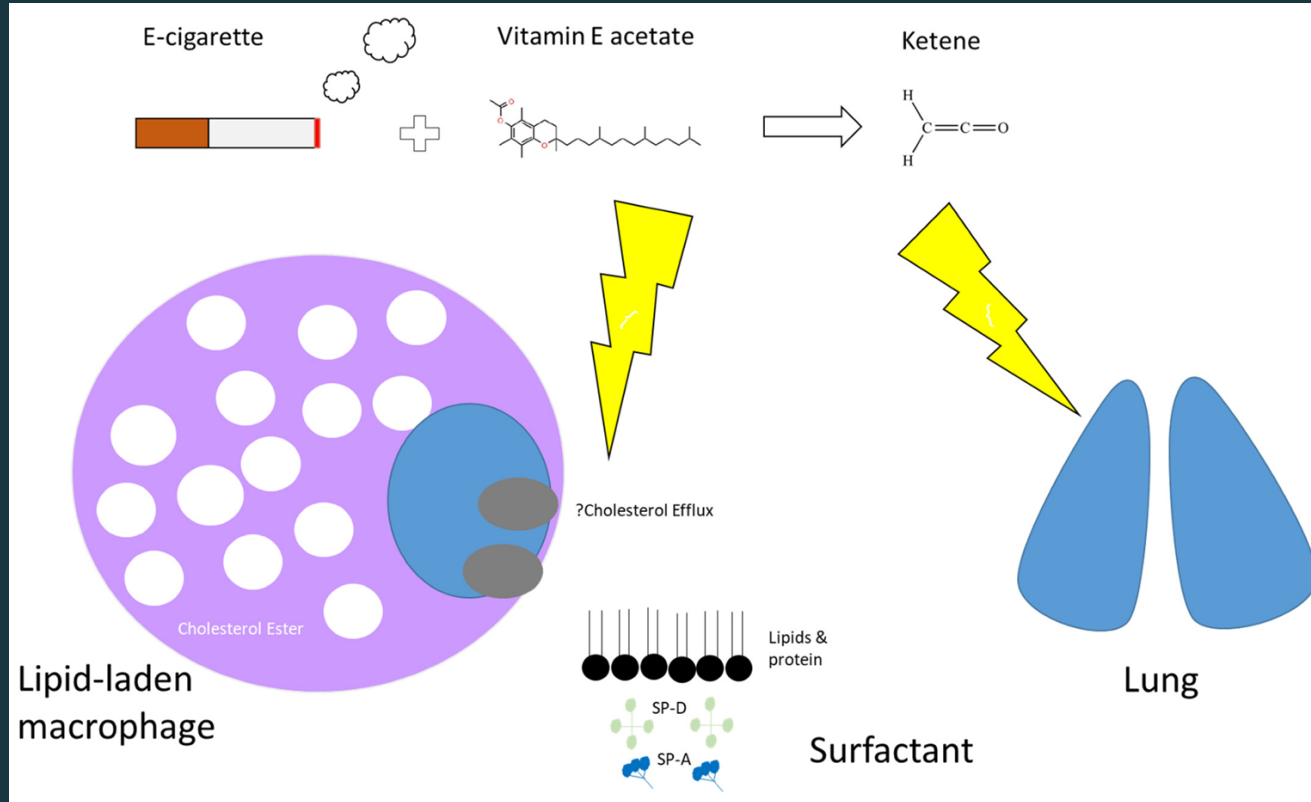
Alveolar Damage and Edema

Immune Response

Surfactant damage



Pathophysiology of EVALI: VEA



- Atelectasis
- Irritation
- Inflammation
- Infection

Pathophysiology of EVALI: Other Substances

Nicotine

Increased airflow response, Pulmonary inflammation and oxidative stress

Flavored e- liquids

Impact macrophage phagocytic ability.
Increase toxic carbonyls & free radicals



VG and PG

Vegetable Glycerin and Propyl Glycol alter surfactant

THC

Still unknown in EVALI

Symptoms and Diagnosis

SYMPTOMS

Respiratory: Persistent cough, shortness of breath, chest pain, and difficulty breathing.

Gastrointestinal: Nausea, vomiting, abdominal pain, and diarrhea.

Systemic: Fever, chills, fatigue, and weight loss.

Progressive: Acute respiratory distress syndrome (ARDS) in severe cases.

DIAGNOSIS

E-Cigarette use in the previous 90 days



Pulmonary Infiltrates on CXR or CT



Absence of pulmonary infection



No alternative cause/diagnosis found

Symptoms and Diagnosis

Thin-section chest CT image depicts dependent consolidation with patchy ground-glass opacities in a manner that is most suggestive of an organizing pneumonia pattern of lung injury. There is subtle subpleural sparing (arrows).



Diseases Associated with EVALI

Symptoms and Diagnosis

- Acute eosinophilic pneumonia
 - Lipoid pneumonia
- Acute lung injury and acute respiratory distress syndrome
 - Acute and subacute hypersensitivity pneumonitis
 - Acute eosinophilic pneumonia
 - Diffuse alveolar hemorrhage
 - Respiratory bronchiolitis-associated pneumonitis
- Organizing pneumonia

Treatment Approaches

Supportive care: Providing symptom relief and monitoring the patient's condition.



Oxygen therapy:
Administering oxygen to help improve breathing and oxygen levels in the blood.



Corticosteroids and quitting vaping: Prescribing corticosteroids to reduce inflammation and advising patients to quit vaping.



Vaping Vs Smoking

1

E-cigarette aerosol generally contains fewer toxic chemicals than the regular cigarettes

2

Nicotine e-cigarette use may reduce prevalence rates of smoking combustible tobacco under some circumstances – controversial

3

Vaping has been found to cause similar effects as smoking on lung function and there are still unknown effects.

Lessons Learned and Future Directions

01

EVALI has had a significant impact on public perception of vaping, leading to increased awareness of its health risks.

02

The EVALI outbreak has prompted research and regulatory changes to better understand and regulate vaping products.

03

Continued vigilance and monitoring are necessary in the vaping industry to ensure the safety of consumers.



Questions

References

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