LUNG LEFTOVERS

AMY RAMSAY, MD, FACEP

OCTOBER 18, 2022

PERTUSSIS

THOROUGH COUGH

BORDETELLA PERTUSSIS

HIGHLY CONTAGIOUS

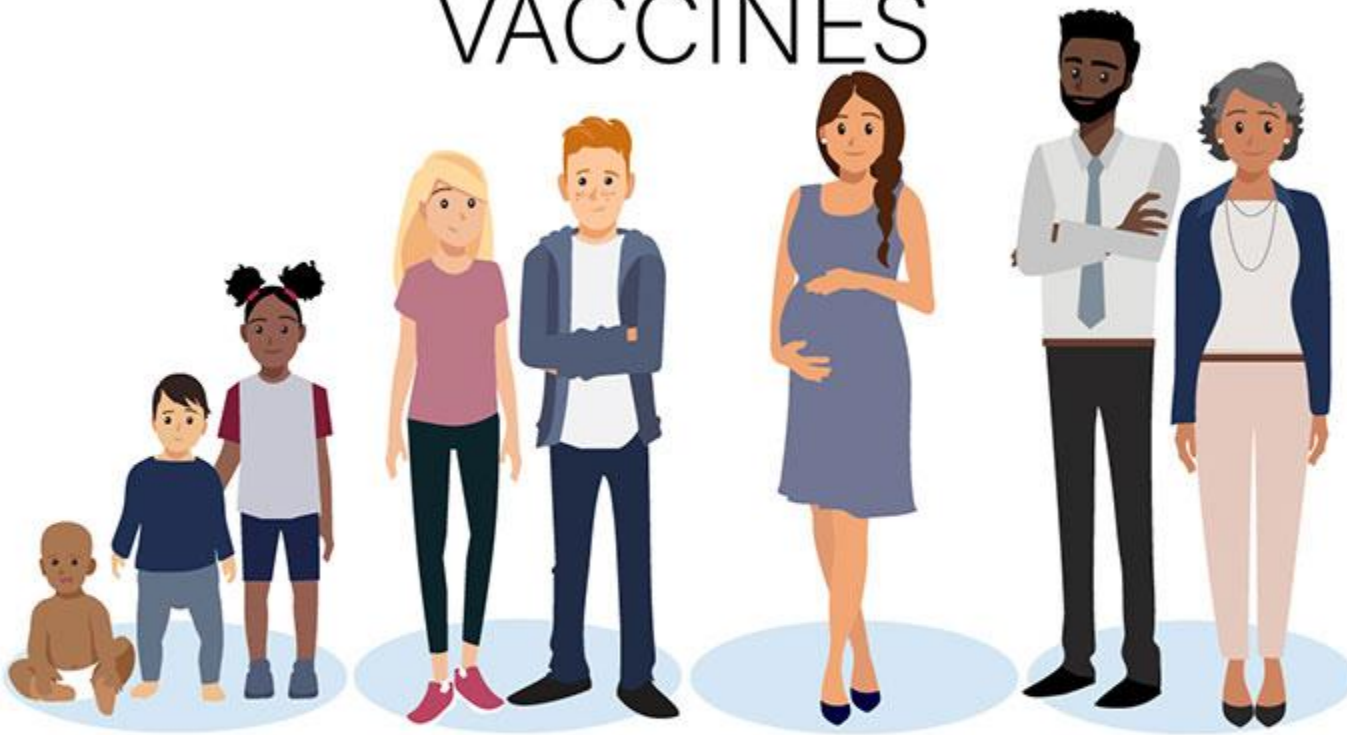
80-100% ATTACK RATE

FOR WEEKS

KIDS AND ADOLESCENTS

NO LIFELONG IMMUNITY

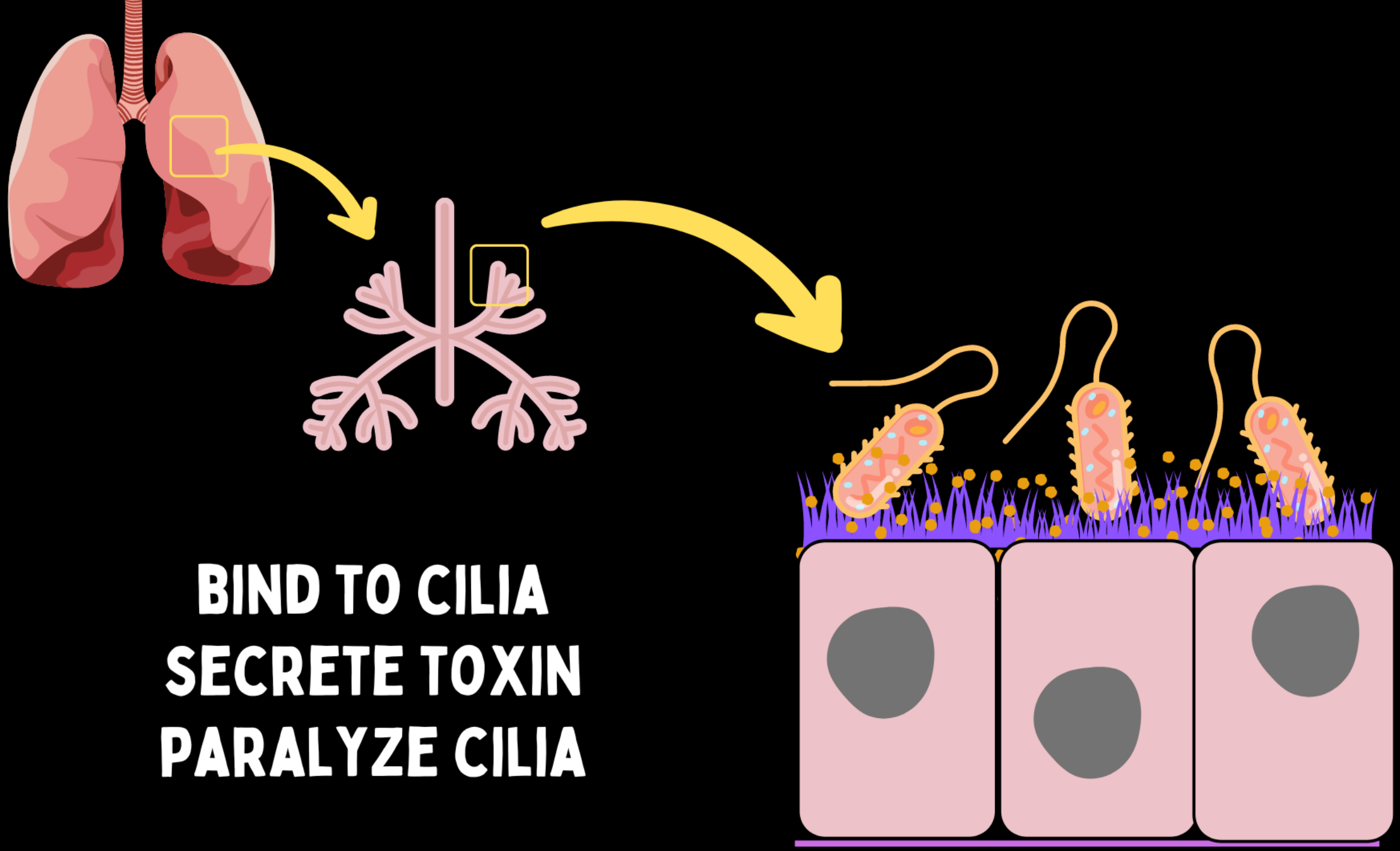
People of all ages need WHOOPING COUGH VACCINES



DTaP for young children	Tdap for preteens	Tdap for pregnant women	Tdap for adults
✓ 2, 4, and 6 months ✓ 15 through 18 months ✓ 4 through 6 years	✓ 11 through 12 years	✓ During the 27-36th week of each pregnancy	✓ Anytime for those who have never received it

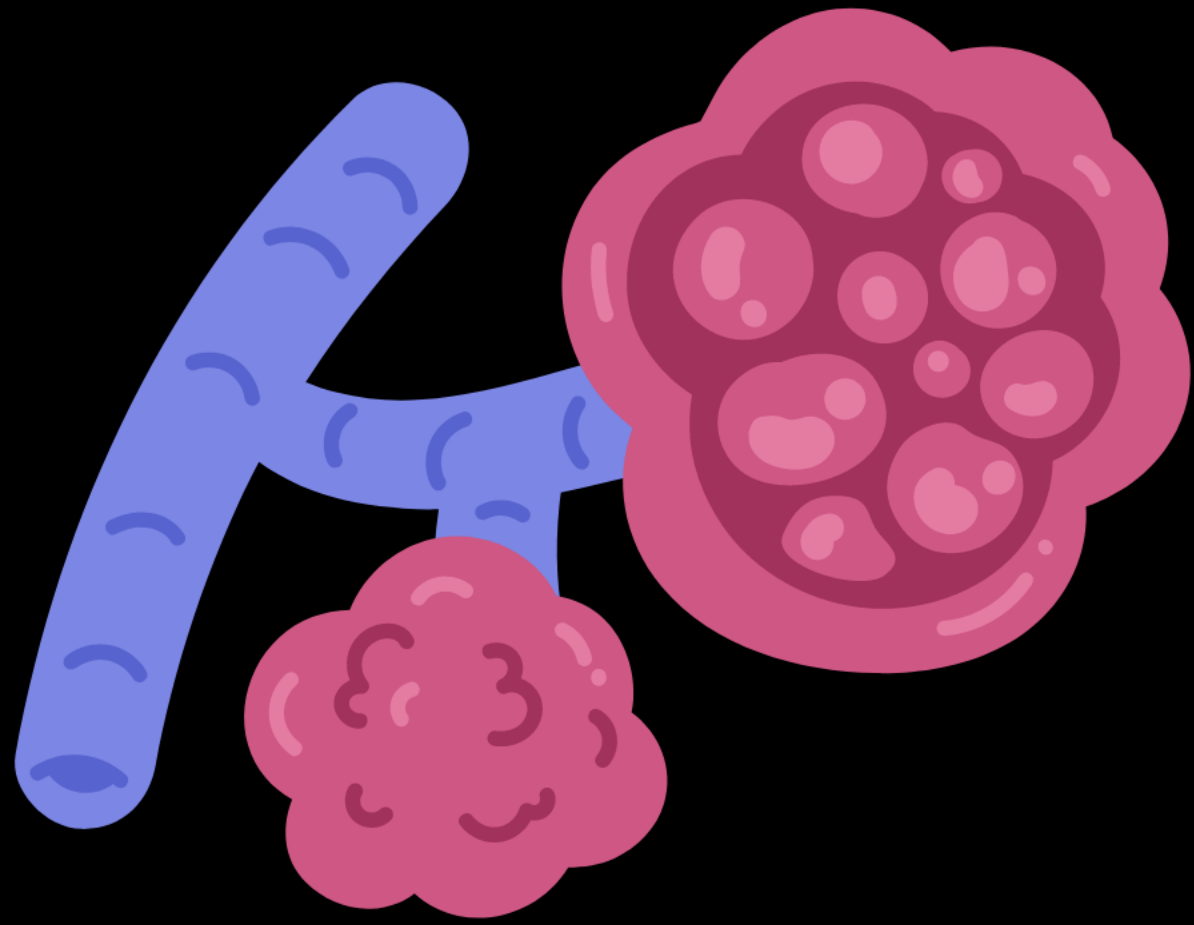
www.cdc.gov/whoopingcough

PEAKS IN THE SUMMER MONTHS



BIND TO CILIA
SECRETE TOXIN
PARALYZE CILIA

PRESENTS LIKE BRONCHIOLITIS



PAROXYSMAL

PAROXYSMS OF COUGING
LONG INSPIRATORY WHOOP
POSTTUSSIVE EMESIS
CYANOSIS
EXHAUSTION

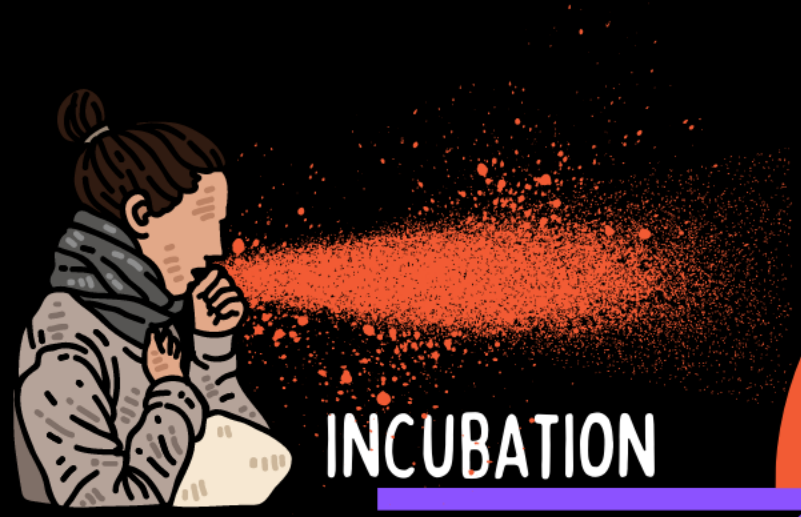
CORYZA
FEVER
MILD COUGH
APNEA

CATARRHAL

RECOVERY
RESIDUAL COUGH

CONVALESCENT

PERTUSSIS TIMELINE



COMMUNICABLE
ONSET + 3 WEEKS

INCUBATION
5-21 DAYS

EXPOSURE

CATARRHAL
1-2 WEEKS

SYMPTOM ONSET

PAROXYSMAL
1-6 WEEKS

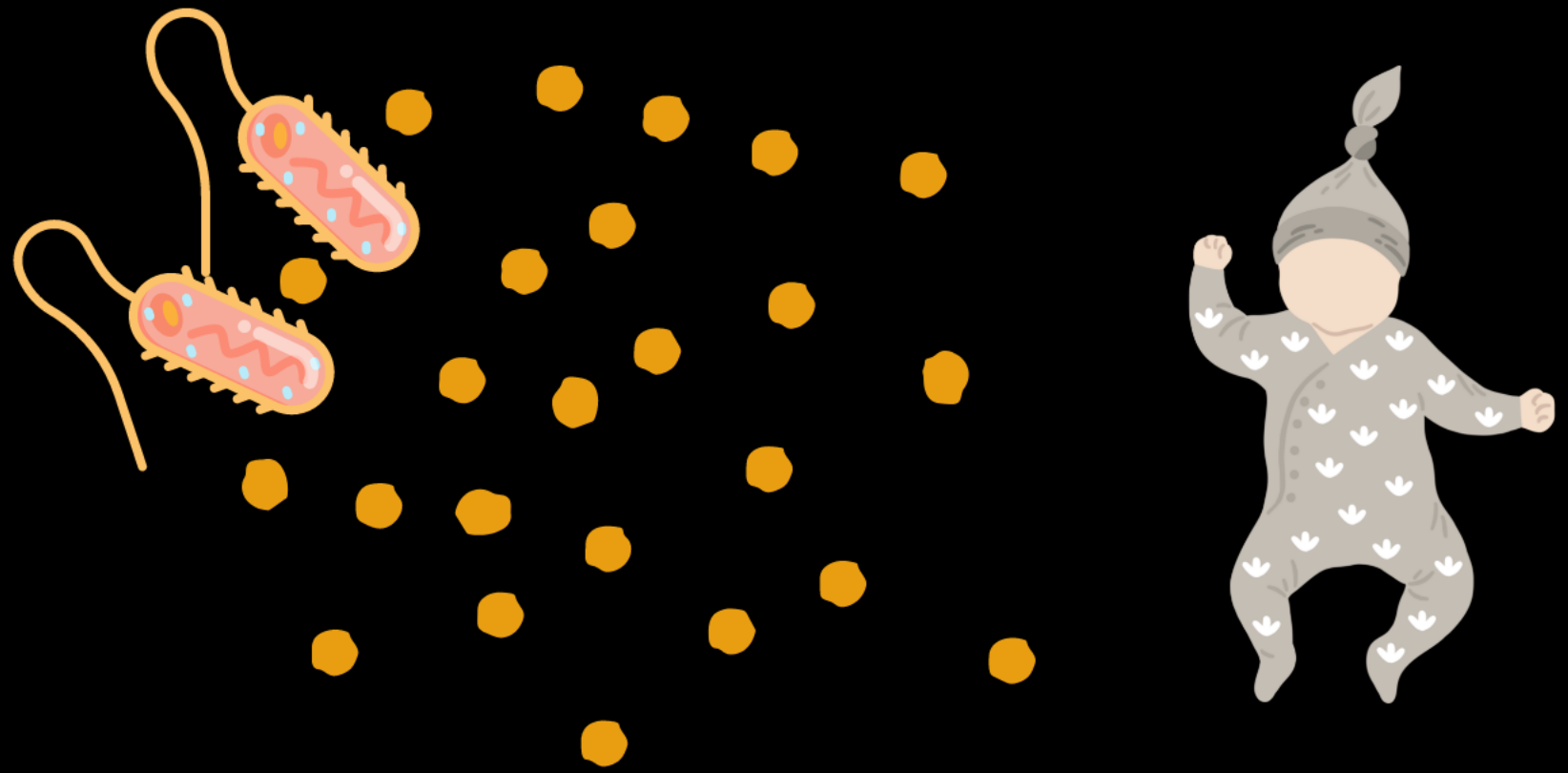
CONVALESCENT
WEEKS TO MONTHS

NOT ALL PATIENTS HAVE THE CLASSIC COUGH

ONLY 1/3 OF ADULTS DEVELOP THE WHOOP

INFANTS CAN PRESENT WITH **APNEA** AND NO OTHER SYMPTOMS

PERTUSSIS TOXIN CAN INCREASE EXCRETION OF INSULIN



HYPOGLYCEMIA

HYPOGLYCEMIA

ABSENCE OF FEVER

TACHYPNEA

BRADYCARDIA

CYANOSIS

APNEA

PERTUSSIS COMPLICATIONS

SUBDURAL HEMATOMA
ENCEPHALOPATHY
SEIZURES

PERIORBITAL EDEMA
SUBCONJUNCTIVAL HEMORRHAGE
PETECHIAE
EPISTAXIS

HEMOPTYSIS
SUBCUTANEOUS EMPHYSEMA
PNEUMOTHORAX
PNEUMOMEDIASTINUM
DIAPHRAGMATIC RUPTURE

UMBILICAL HERNIA
INGUINAL HERNIA
RECTAL PROLAPSE

HOSPITALIZED INFANTS

68% APNEA

22% PNEUMONIA

2% SEIZURES

0.6% ENCEPHALOPATHY

1% WILL NOT SURVIVE TO DISCHARGE

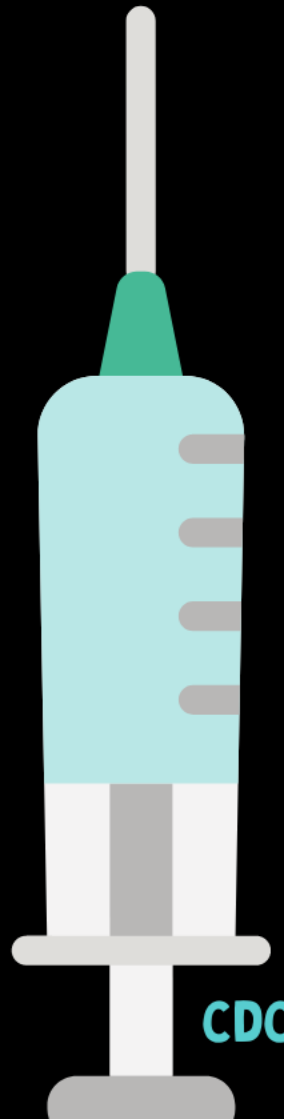
CDC.GOV

MOST COMMON CAUSE OF DEATH:

SECONDARY BACTERIAL PNEUMONIA

TDAP VACCINE IN THIRD TRIMESTER

PREVENTS 78% OF PERTUSSIS INFECTIONS IN INFANTS < 2 MONTHS OF AGE



90% EFFECTIVE IN PREVENTING INFANT HOSPITALIZATION FOR PERTUSSIS

CDC.GOV

CONSIDER PERTUSSIS

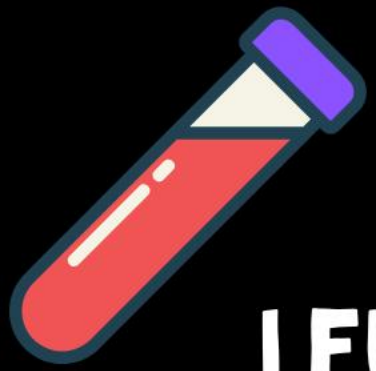
IN PATIENTS WITH COUGH LASTING LONGER THAN 2 WEEKS

27%

OF ADULTS WITH PROLONGED COUGH HAVE SEROLOGIC EVIDENCE OF PERTUSSIS

DIAGNOSIS

LABS



MARKED LEUKOCYTOSIS

15-100 THOUSAND/MM^3

LYMPHOCYTOSIS

CXR

NONSPECIFIC

SEND NP SWAB FOR:

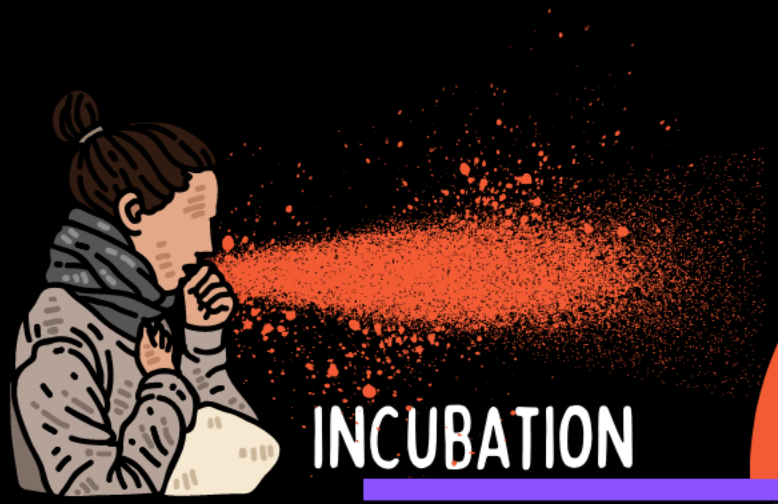
DIAGNOSIS

PCR
FASTER

AND

CULTURE
100% SPECIFIC

START ANTIBIOTICS HERE



COMMUNICABLE
ONSET + 3 WEEKS

INCUBATION | CATARRHAL | PAROXYSMAL | CONVALESCENT

EXPOSURE

5-21 DAYS

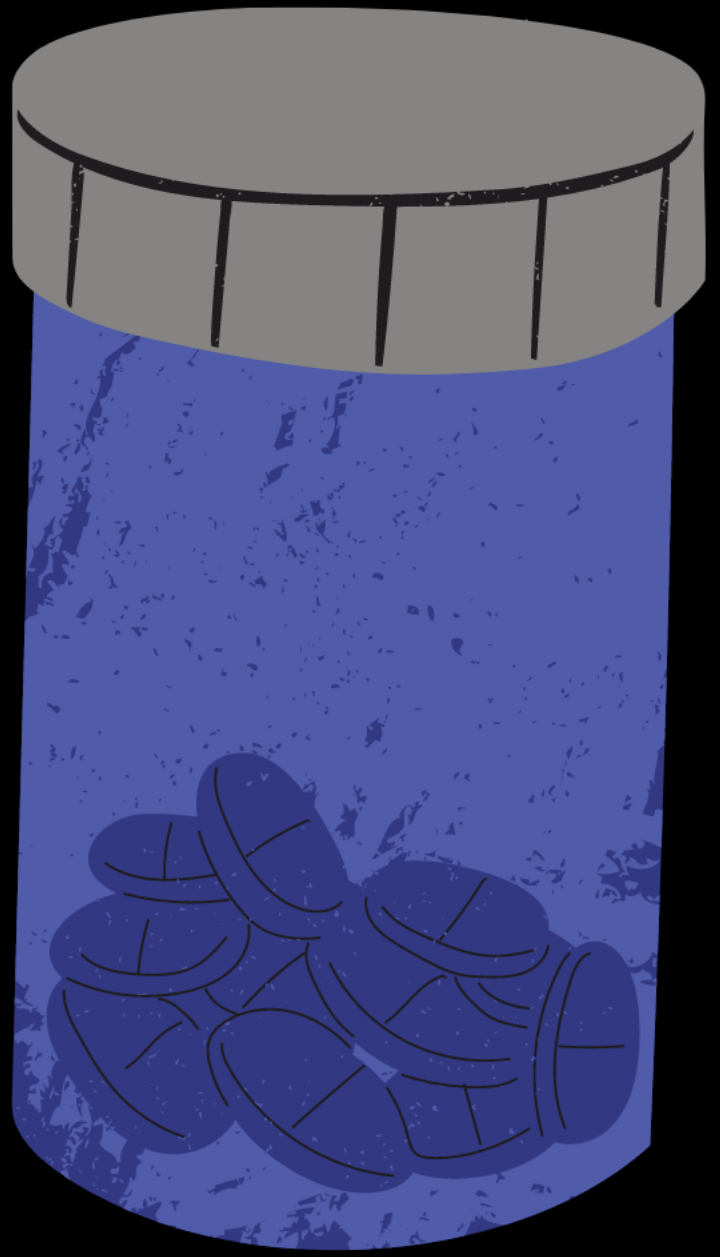
SYMPTOM ONSET

1-2 WEEKS

1-6 WEEKS

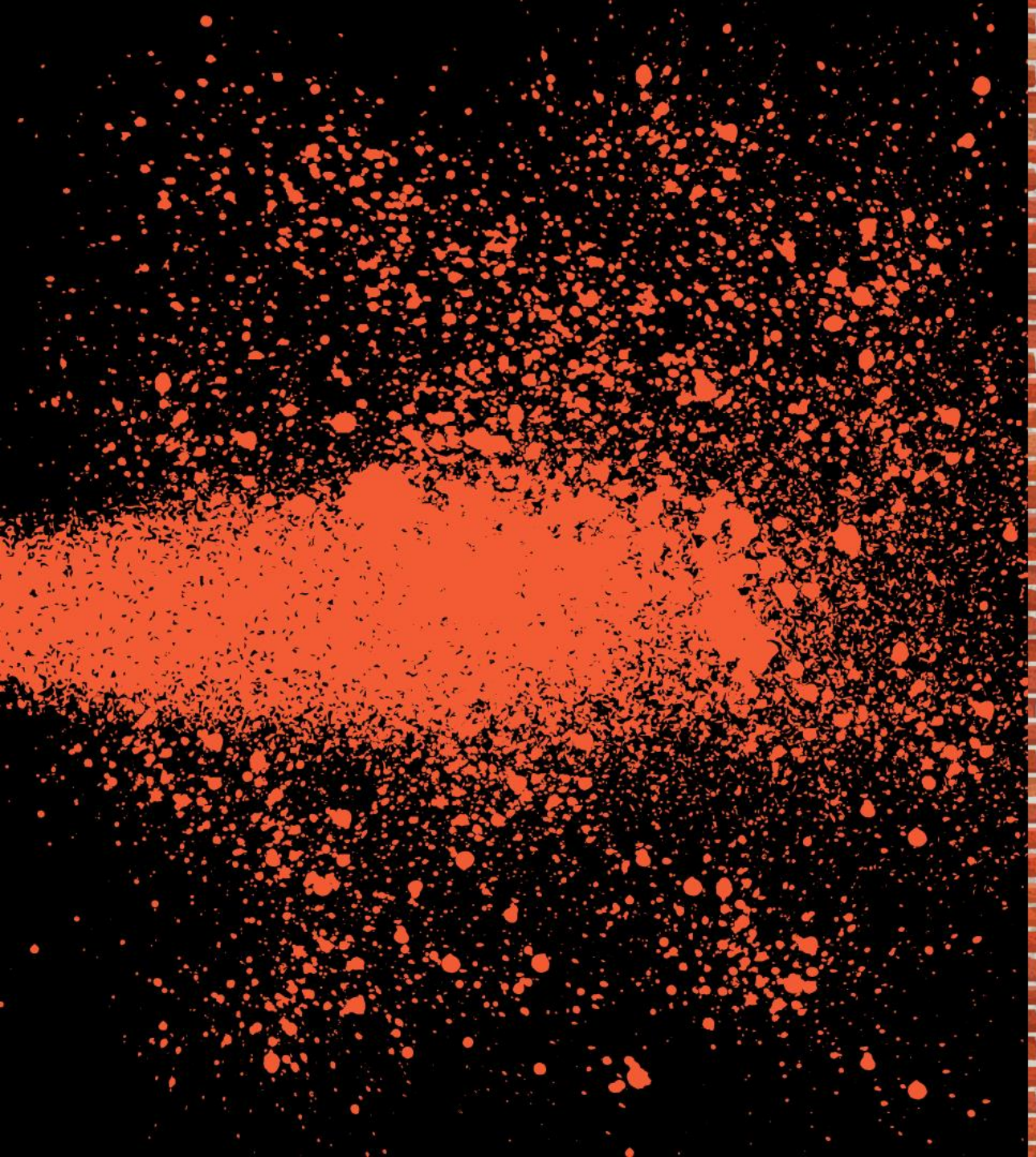
WEEKS TO MONTHS

ANTIBIOTIC TREATMENT DOES NOT SIGNIFICANTLY REDUCE THE SEVERITY OR DURATION OF ILLNESS



UNLESS STARTED DURING WEEKS 1-2

BEFORE THE PAROXYSMAL COUGH BEGINS



THE GOAL OF ANTIBIOTICS IS TO DECREASE TRANSMISSION

CDC TREATMENT GUIDELINES

UP TO 3 WEEKS

AFTER ONSET OF COUGH

UP TO 6 WEEKS


MACROLIDES
ERYTHROMYCIN
CLARITHROMYCIN
AZITHROMYCIN

POSTEXPOSURE PROPHYLAXIS

HOUSEHOLD CONTACTS

PEOPLE AT HIGH RISK FOR SEVERE DISEASE AND THEIR CONTACTS

HTTPS://WWW.CDC.GOV/PERTUSSIS/PEP.HTML

Pediatric Clinicians Play a Critical Role in

RECOGNIZING INFANT PERTUSSIS

apnea

coryza

low-grade fever

exhaustion

minimal coughing

paroxysms

no "whoop"

posttussive vomiting

Infants may not have classic symptoms.
Think about pertussis!

cdc.gov/pertussis/clinical

CDC

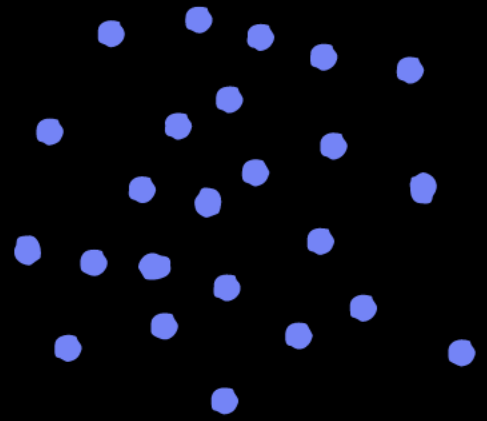
PNEUMOCONIOSES

COAL WORKERS PNEUMOCONIOSIS

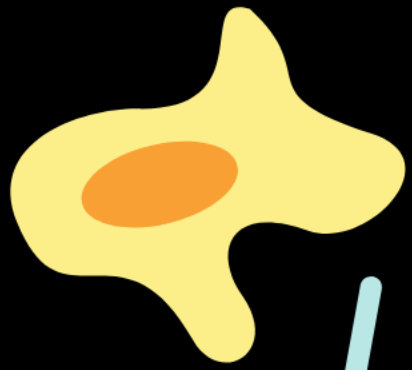
ASBESTOSIS
SILICOSIS

DUST EXPOSURE

INFLAMMATORY CYTOKINE RELEASE

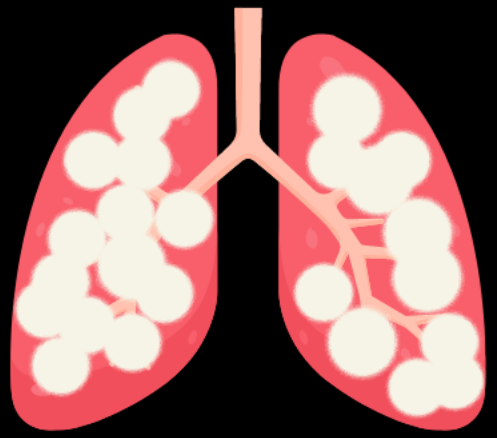


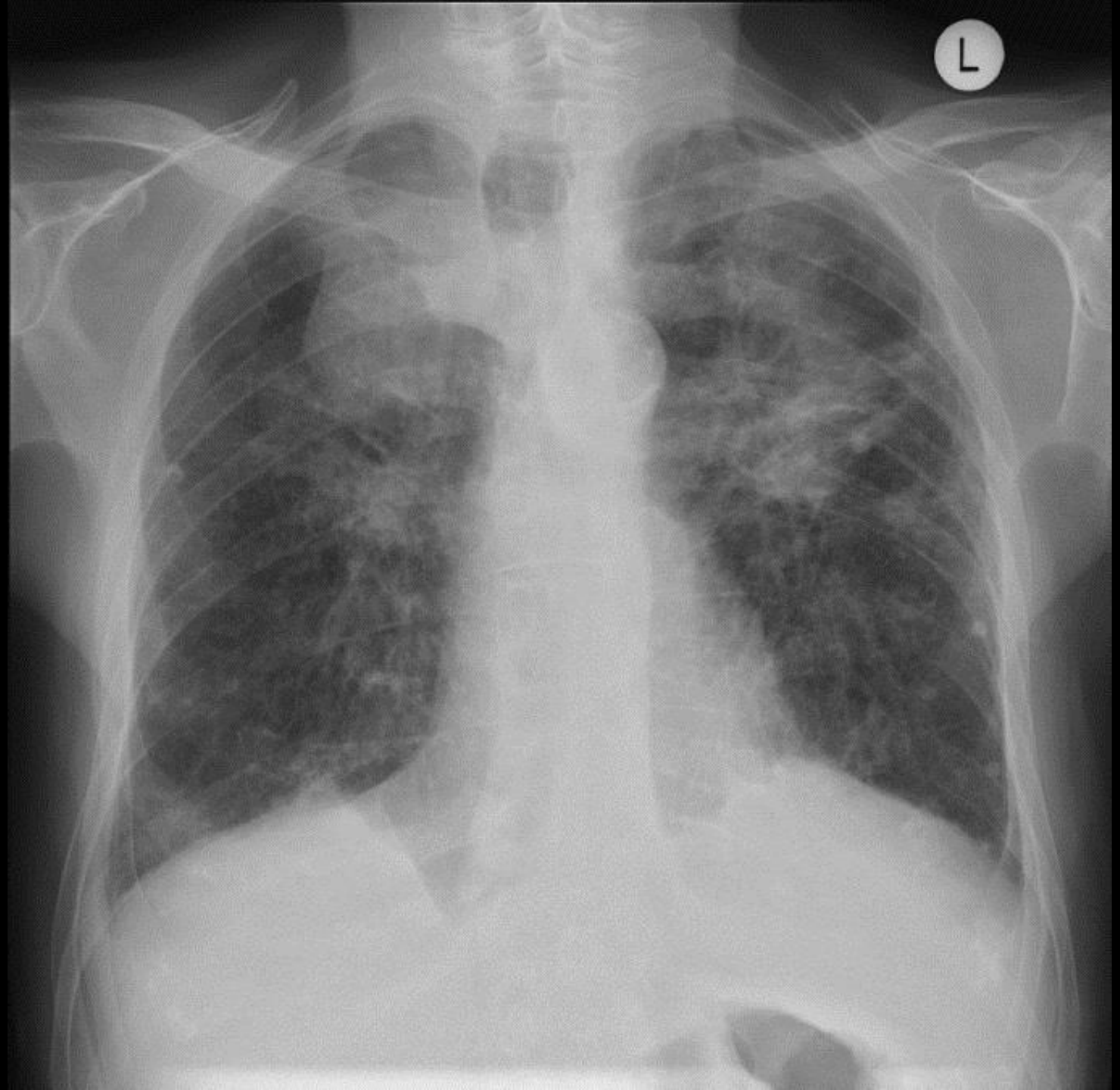
ACTIVATION OF FIBROBLASTS



FIBROBLASTS SURROUND DUST

NODULES LEAD TO FIBROSIS

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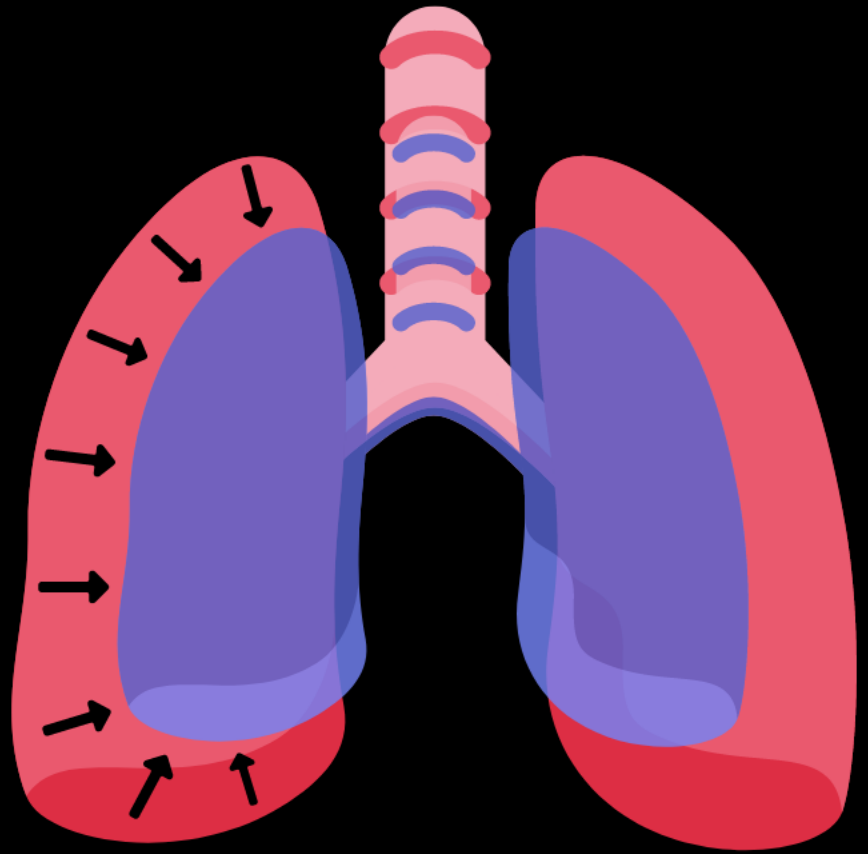
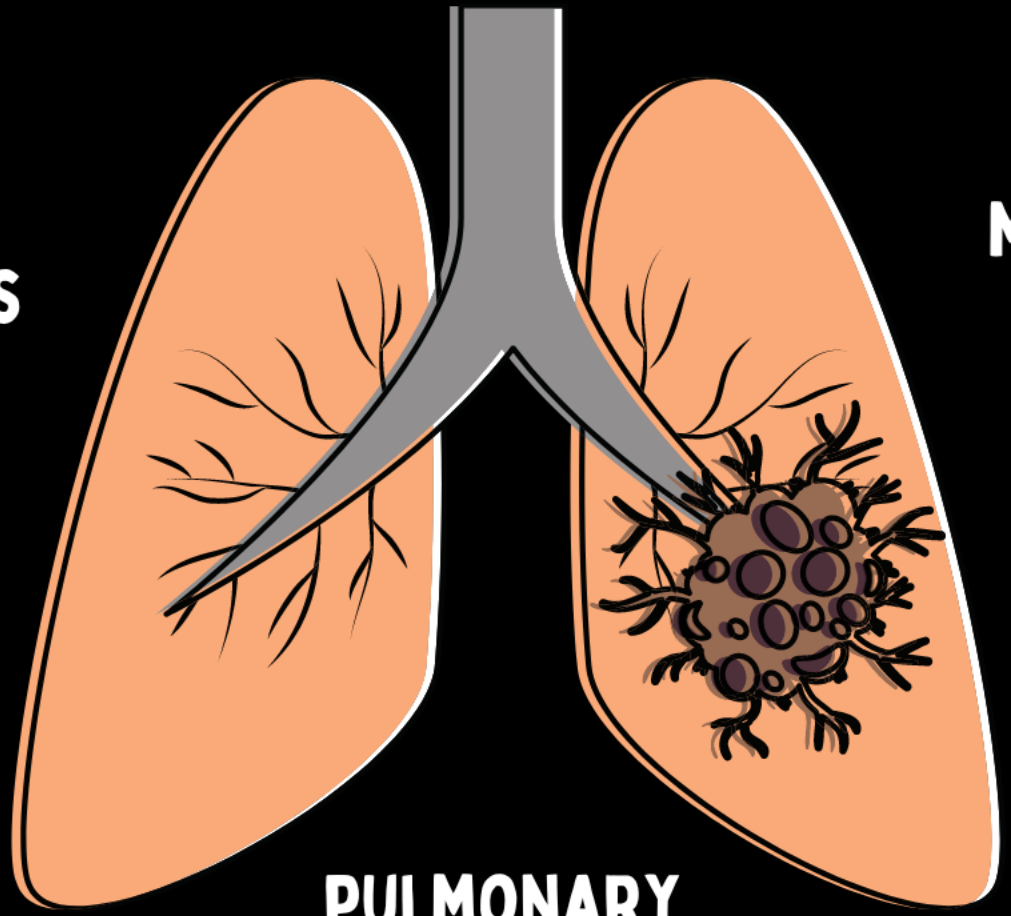
FIBROSIS LEADS TO RESTRICTIVE LUNG DIEASE



ED CONCERNS

INFECTION/
TUBERCULOSIS

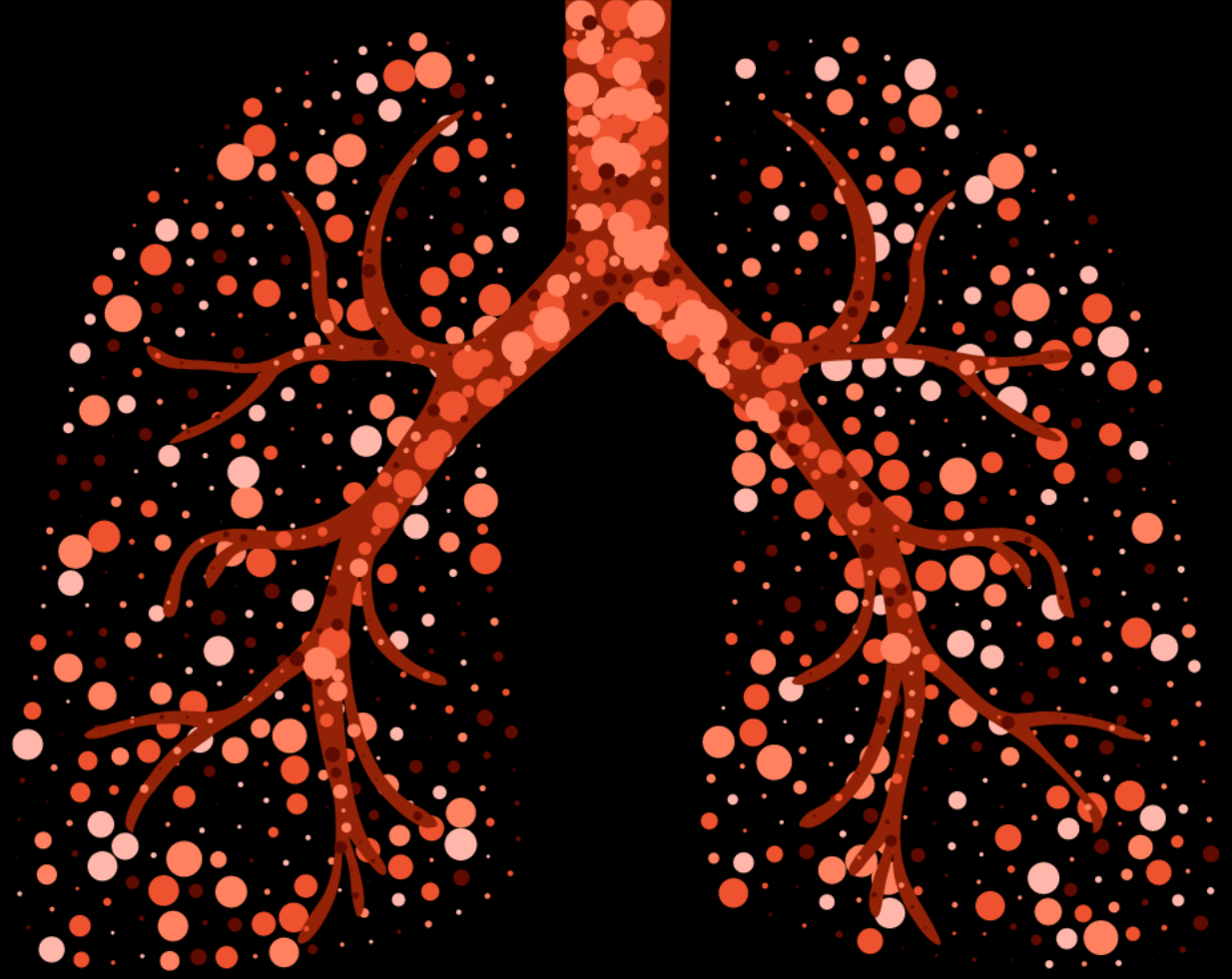
WORSENING
HYPOXEMIA



MALIGNANCY

RIGHT HEART
FAILURE

PULMONARY
HYPERTENSION



INHALED TOXINS

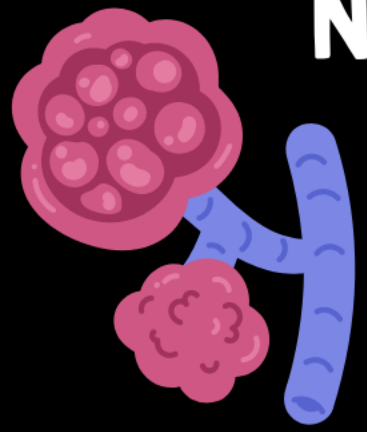
ASPHYXIANTS

PULMONARY IRRITANTS

ASPHYXIANTS

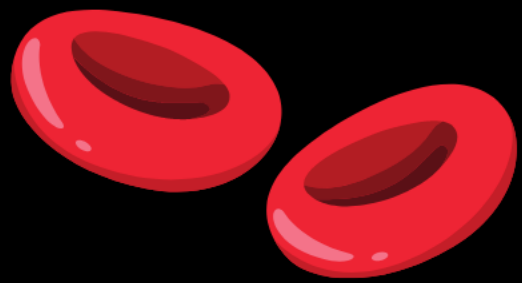
SIMPLE

CARBON DIOXIDE
METHANE
NITROGEN
NITROUS OXIDE
HELIUM



CHEMICAL

CARBON MONOXIDE
HYDROGEN CYANIDE
HYDROGEN SULFIDE



ASPHYXIANTS

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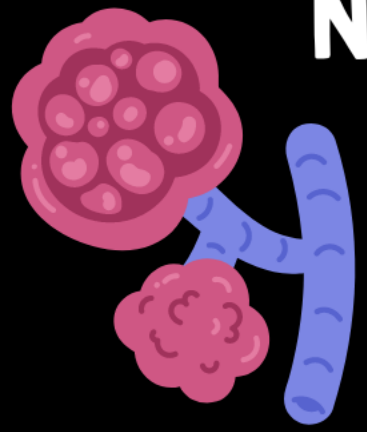
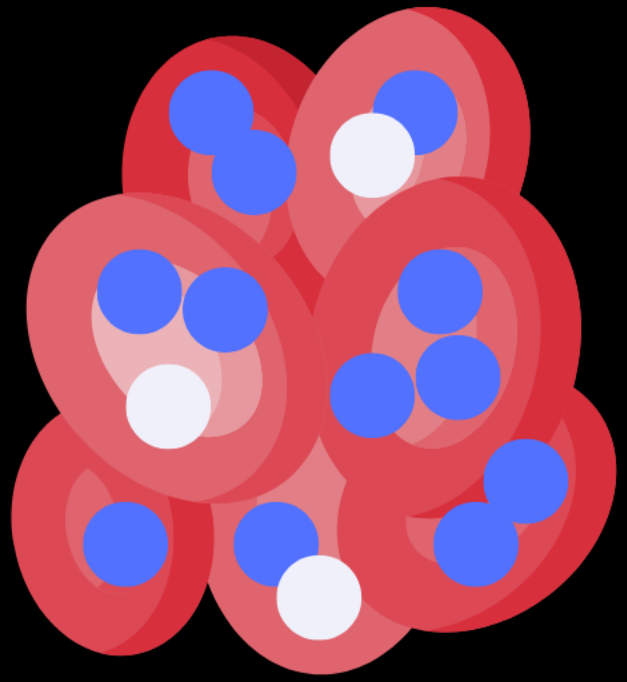


CHEMICAL

CARBON MONOXIDE
HYDROGEN CYANIDE
HYDROGEN SULFIDE

SIMPLE ASPHYXIANTS

DISPLACE OXYGEN



REDUCE FIO2

PHARMACEUTICALS

New Execution Method Touted as More 'Humane,' but Evidence Is Lacking

A legal battle over nitrogen hypoxia, a new potential method of execution, raises ethical questions

By Dana G. Smith on September 23, 2022

A lethal injection execution chamber in Texas. A new execution method would instead involve nitrogen hypoxia. Credit: Bernd Obermann/Getty Images

npr South Carolina public radio

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NATIONAL

Alabama could use nitrogen hypoxia for executions in death sentences. What is it?

September 13, 2022 · 4:15 AM ET

AYANA ARCHIE

Officials escort murder suspect Alan Eugene Miller away from the Pelham City Jail in Ala., on Aug. 5, 1999. Miller, scheduled to be put to death by lethal injection on Sept. 22, 2022, for a workplace shooting rampage in 1999 that killed three men, says the state lost the paperwork he turned in selecting an alternate execution method.

Dave Martin/AP

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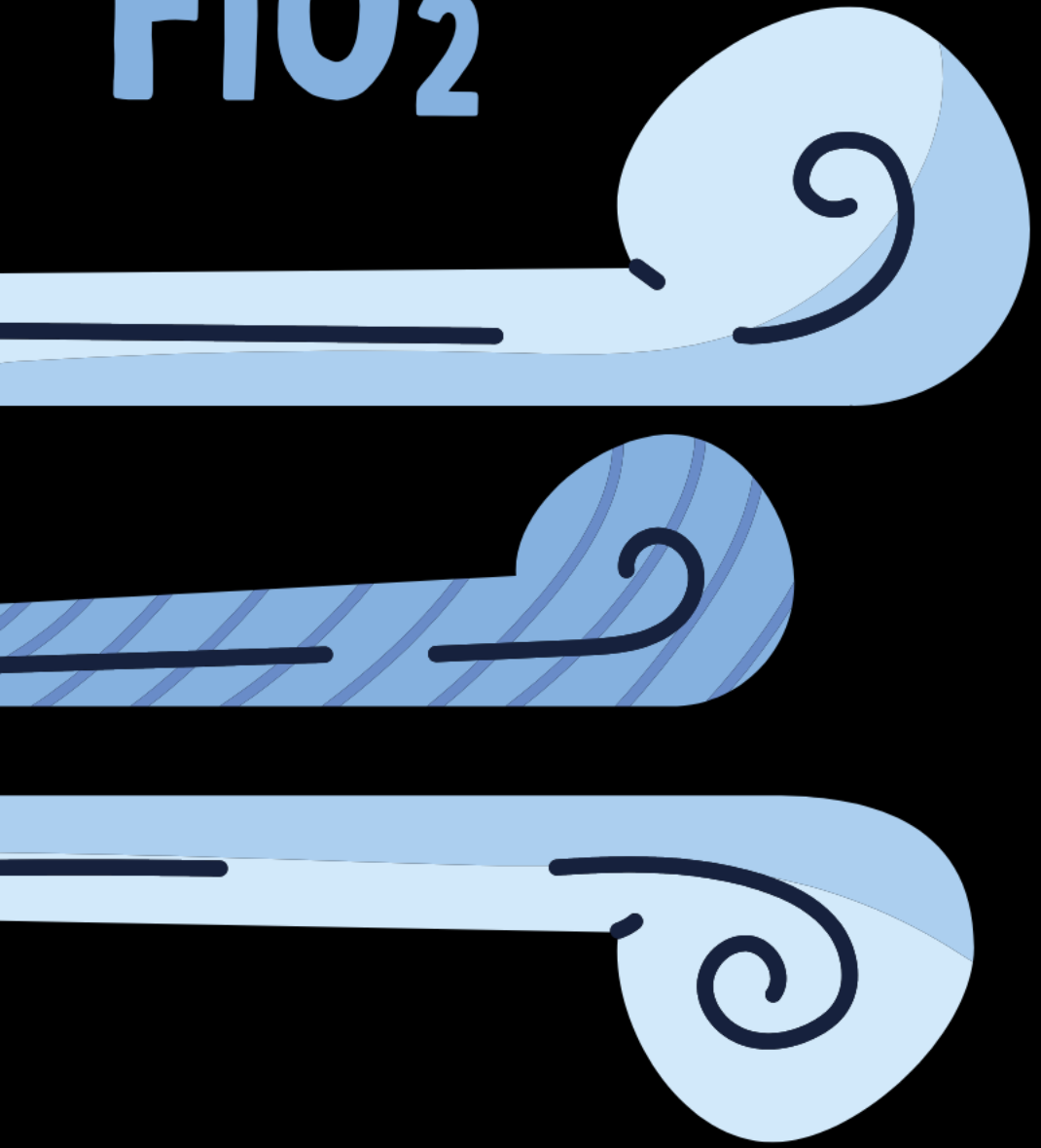
U.S. NEWS

Alabama not ready to execute by nitrogen hypoxia, which would have forced inmate to breathe only nitrogen

Alan Miller, convicted of killing three men in 1999, had requested the method for his Sept. 22 execution. Officials said they are ready to use lethal injection,instead.

Officials escort Alan Eugene Miller from the Pelham City Jail in Alabama on Aug. 5, 1999. Dave Martin / AP file

FIO_2



21% NORMAL

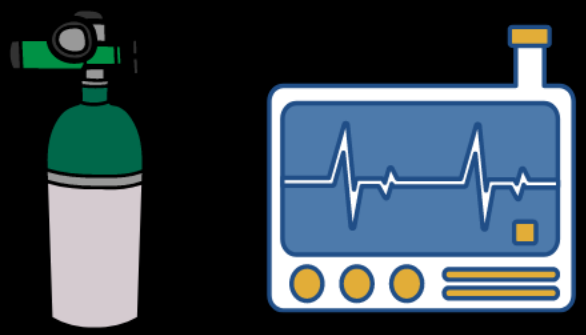
15%
TACHYPNEA
TACHYCARDIA
DYSPNEA
ATAXIA
DIZZINESS
CONFUSION

10%
CEREBRAL EDEMA
LETHARGY

6%
SEIZURES
COMA
DEATH

ED MANAGEMENT

MINOR/RESOLVING SYMPTOMS



SUPPORTIVE CARE
OBSERVE 6 HOURS
DISCHARGE

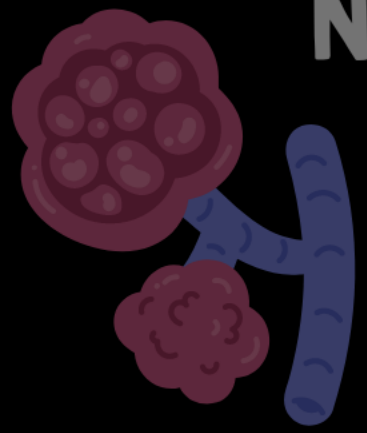
SIGNIFICANT SYMPTOMS

ADMIT FOR OBSERVATION

ASPHYXIANTS

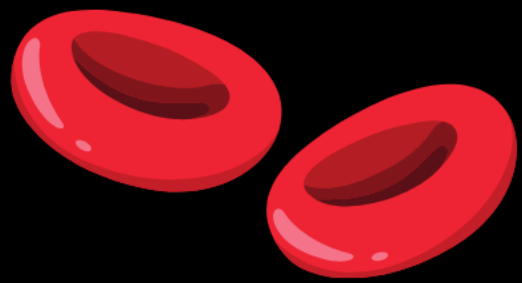
SIMPLE

CARBON DIOXIDE
METHANE
NITROGEN
NITROUS OXIDE
HELIUM



CHEMICAL

CARBON MONOXIDE
HYDROGEN CYANIDE
HYDROGEN SULFIDE

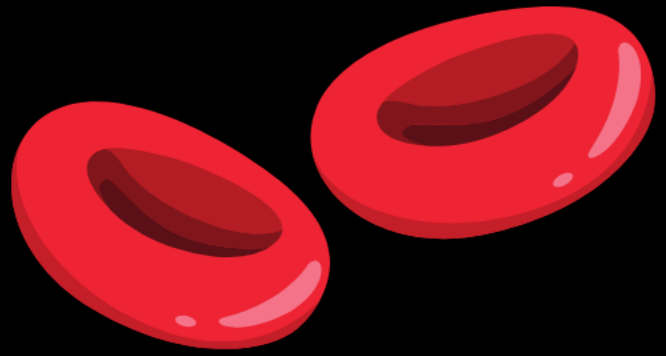


CHEMICAL ASPHYXIANTS

AFFECT DELIVERY AND CONSUMPTION OF OXYGEN

CARBON MONOXIDE

HYDROGEN CYANIDE
HYDROGEN SULFIDE



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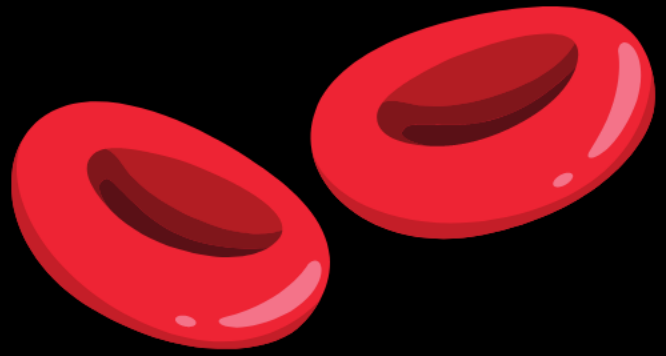
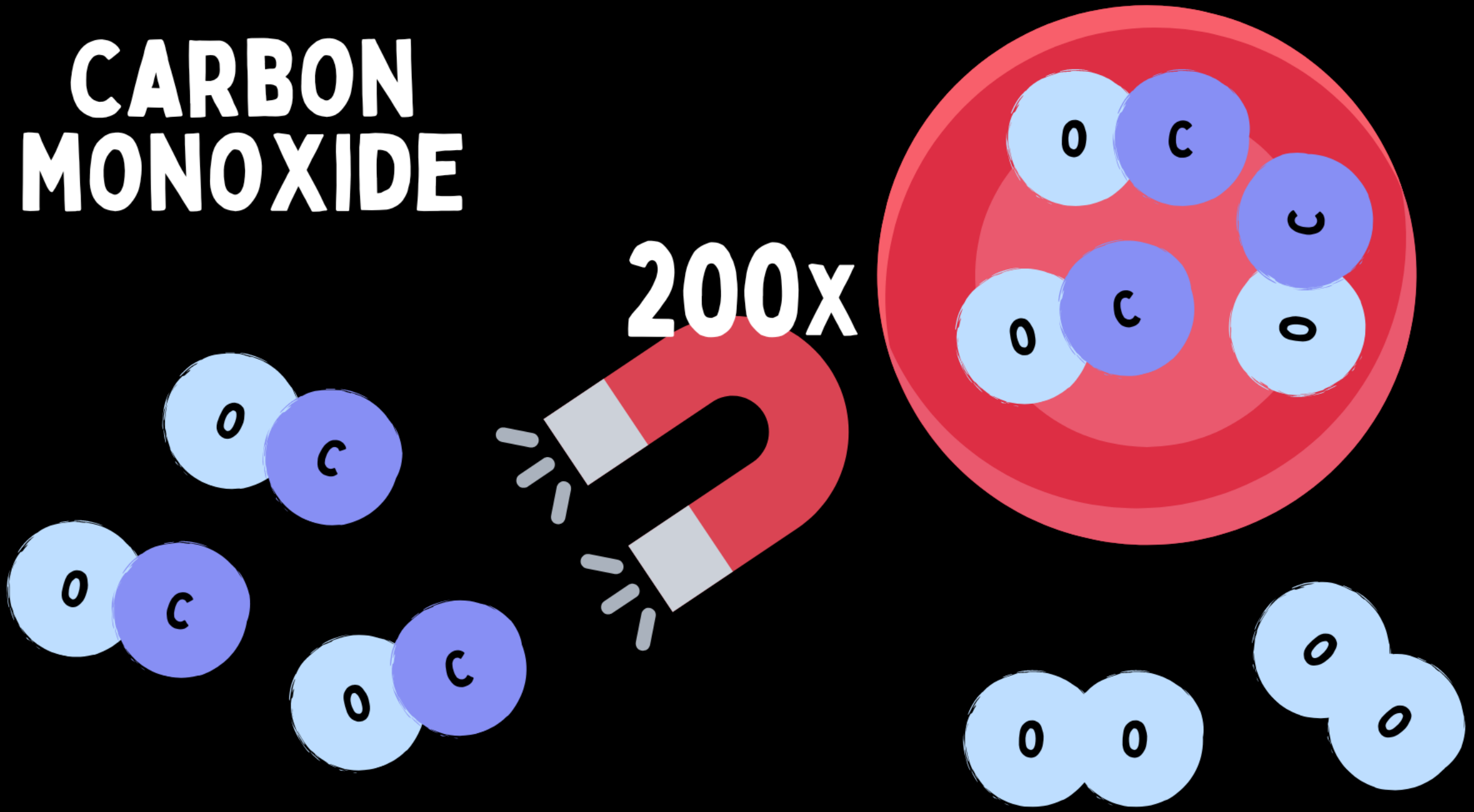
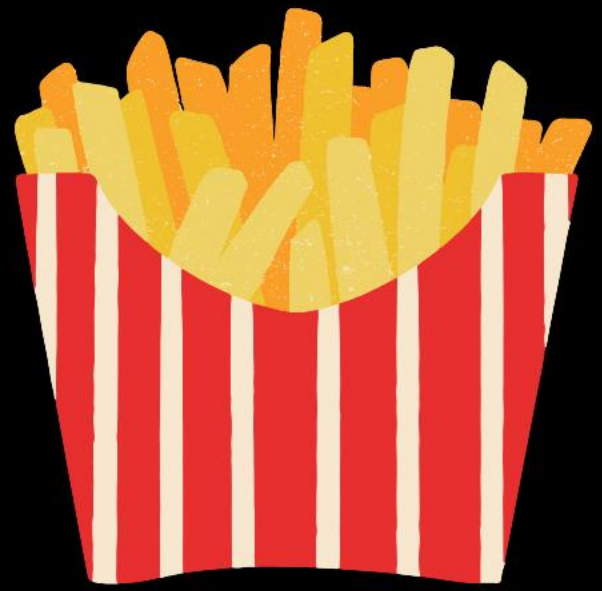
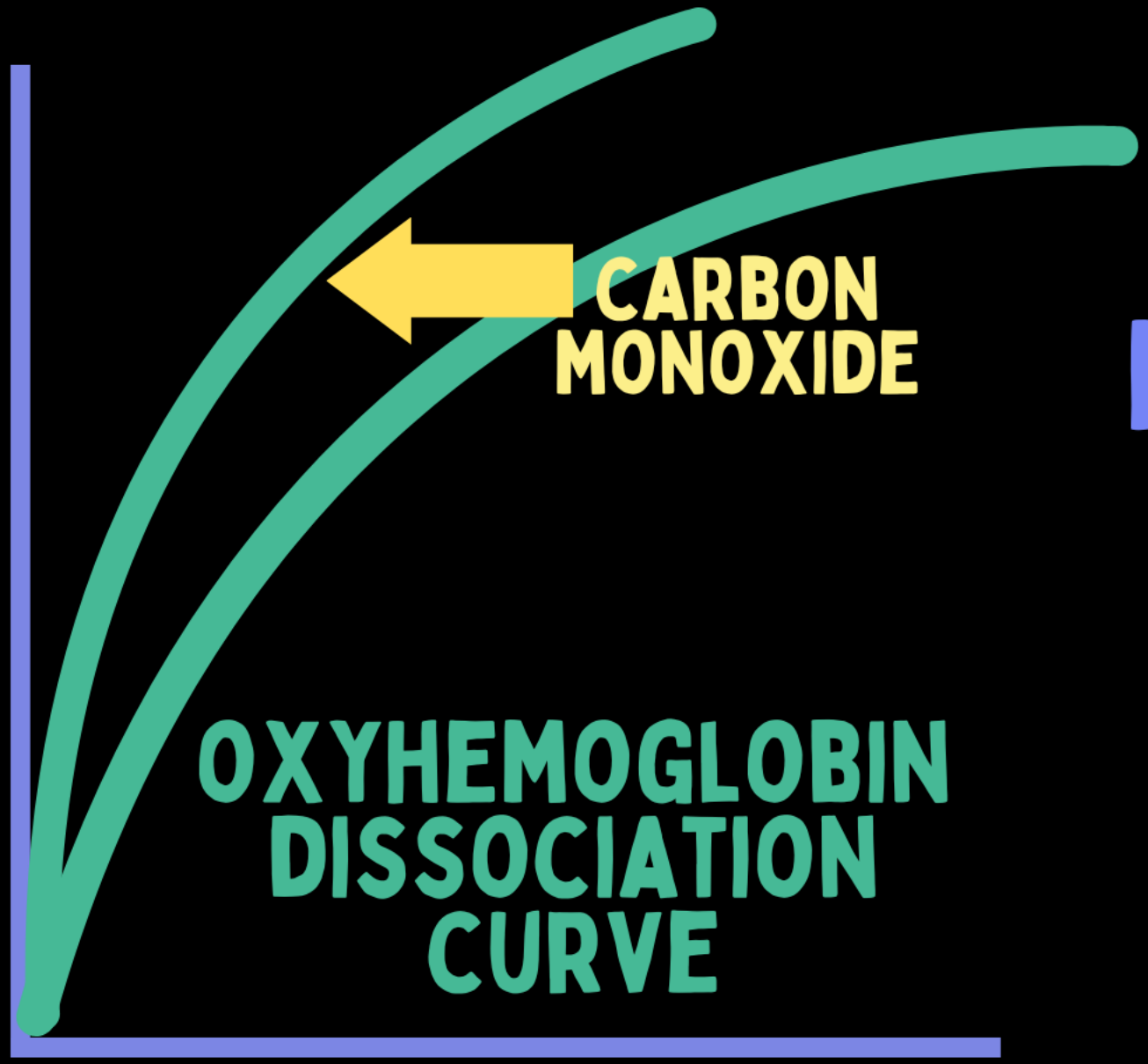


CARBON MONOXIDE

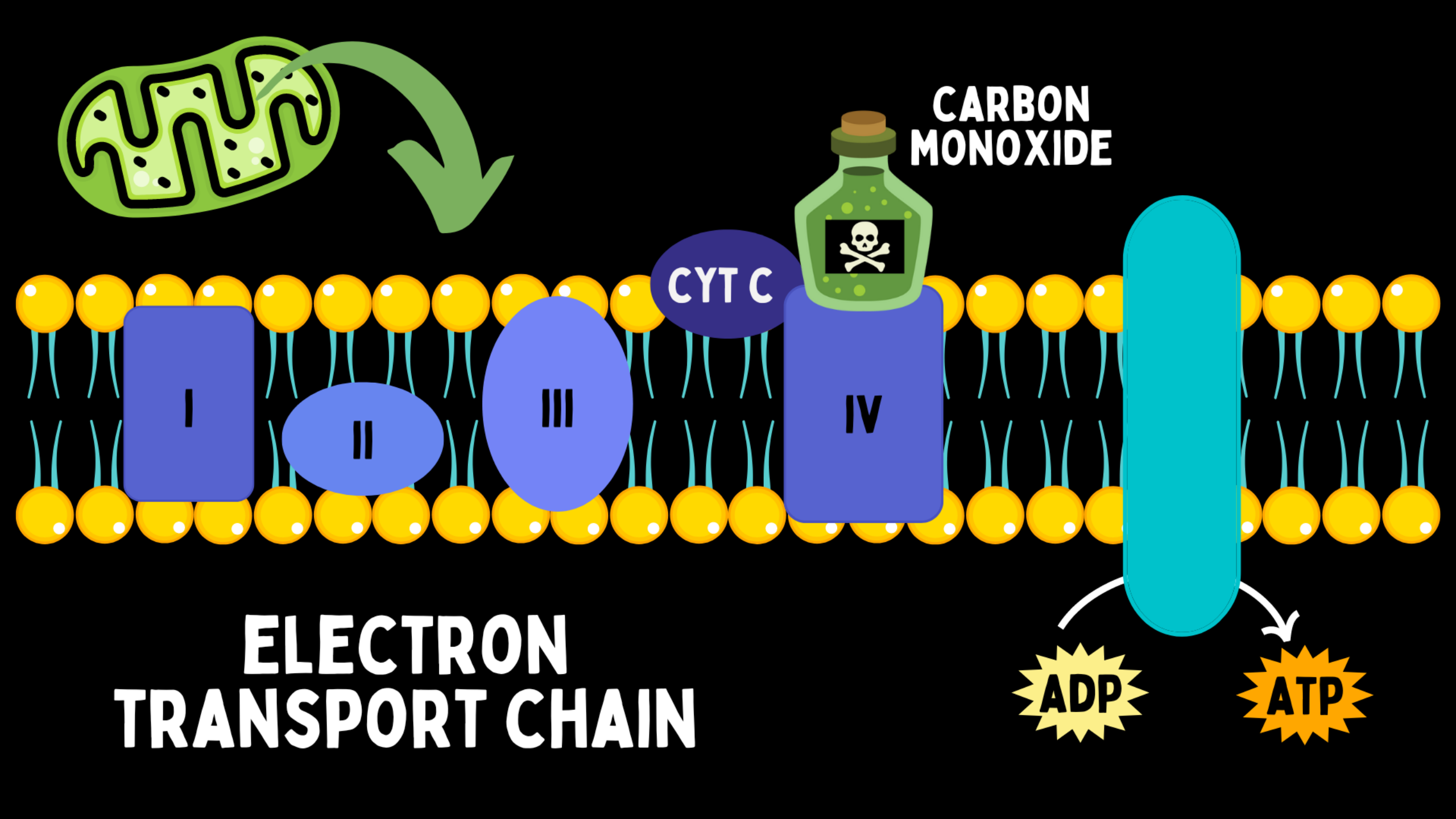


200x





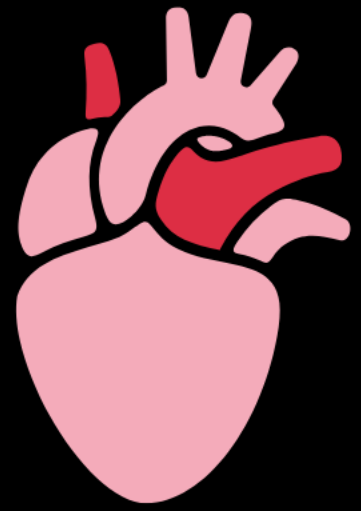
HARDER TO UNLOAD OXYGEN


CARBON MONOXIDE
CYT C
I
II
III
IV
ADP
ATP
ELECTRON TRANSPORT CHAIN

CARBON MONOXIDE POISONING

METABOLIC ACIDOSIS

ALTERED MENTAL STATUS
SEIZURES
COMA



HYPOTENSION
CARDIAC ARREST

CARBON MONOXIDE POISONING

100% OXYGEN

REDUCES HALF LIFE OF COHB FROM 5 HOURS TO

NORMOBARIC — 1 HOUR

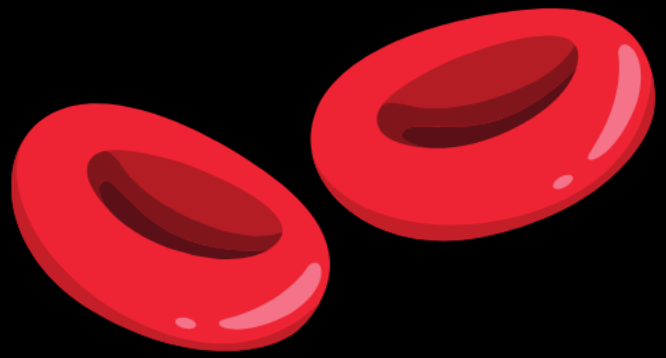
HYPERBARIC — 0.5 HOUR

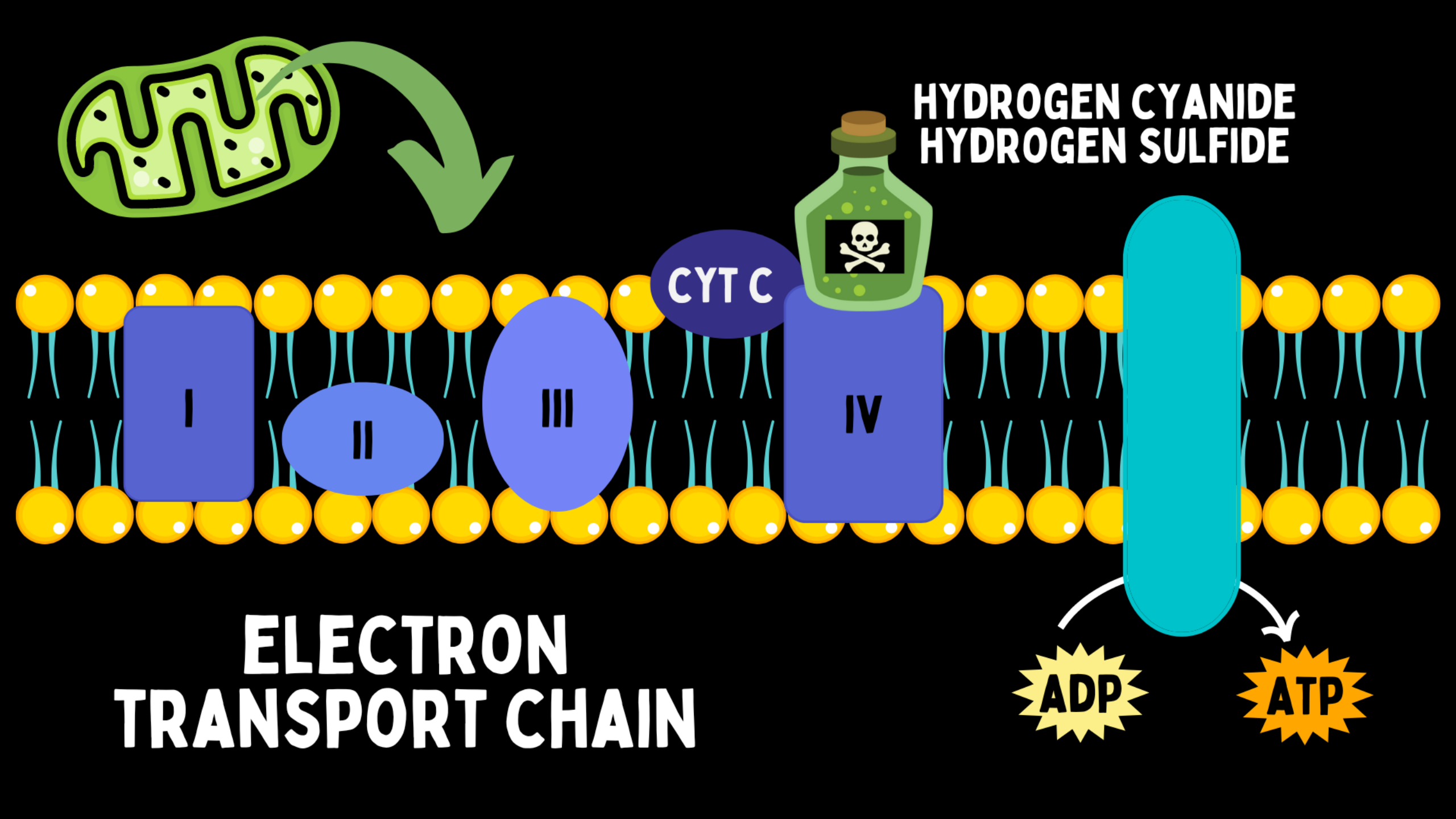
CHEMICAL ASPHYXIANTS

AFFECT DELIVERY AND CONSUMPTION OF OXYGEN

CARBON MONOXIDE

HYDROGEN CYANIDE
HYDROGEN SULFIDE

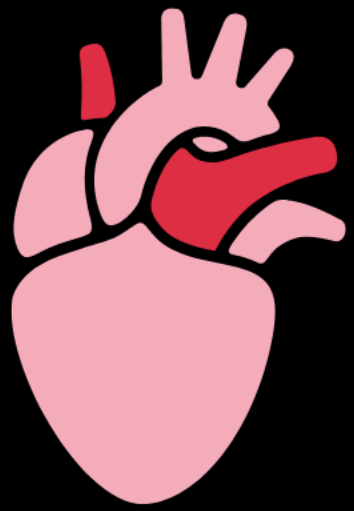



HYDROGEN CYANIDE
HYDROGEN SULFIDE
CYT C
I
II
III
IV
ADP
ATP
ELECTRON
TRANSPORT CHAIN

CYANIDE TOXICITY

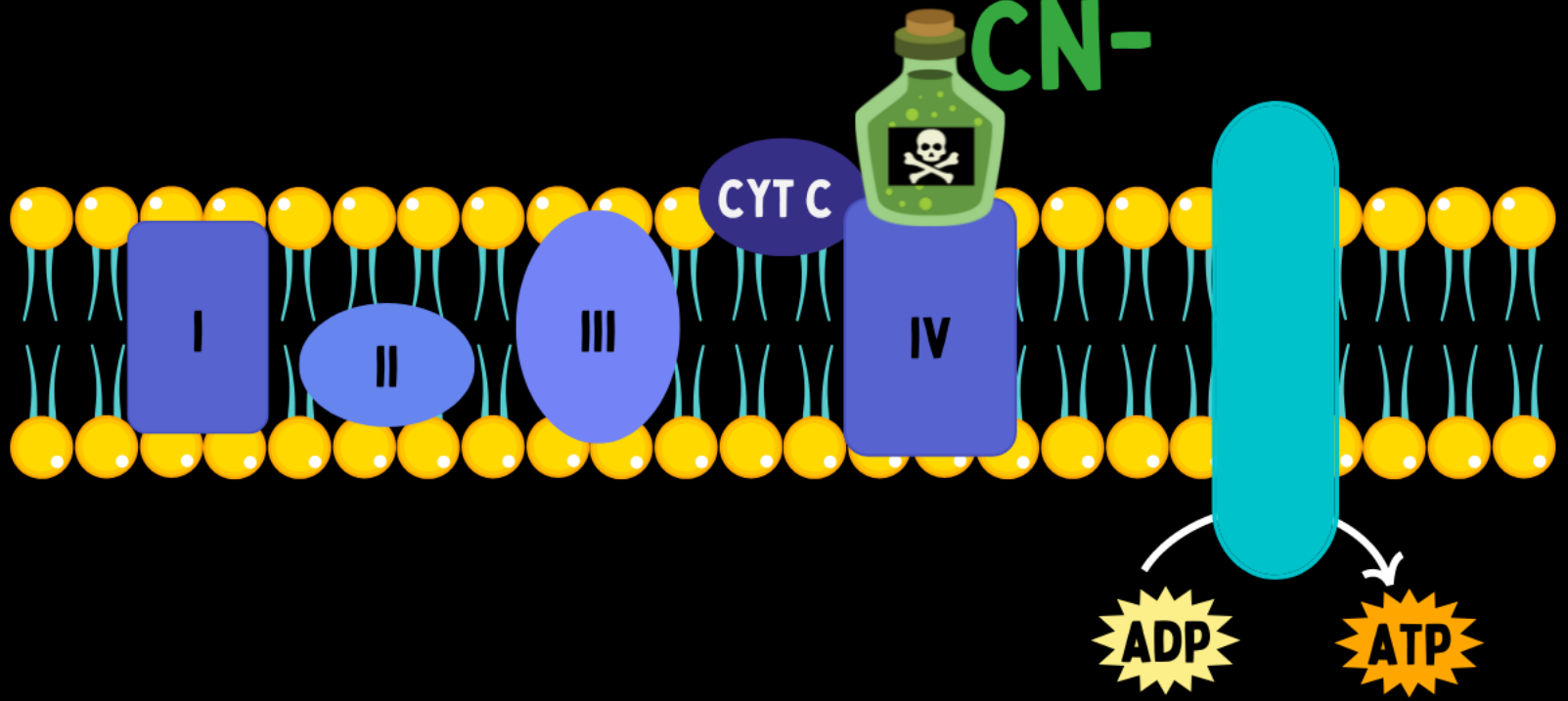
PROFOUND LACTIC ACIDOSIS

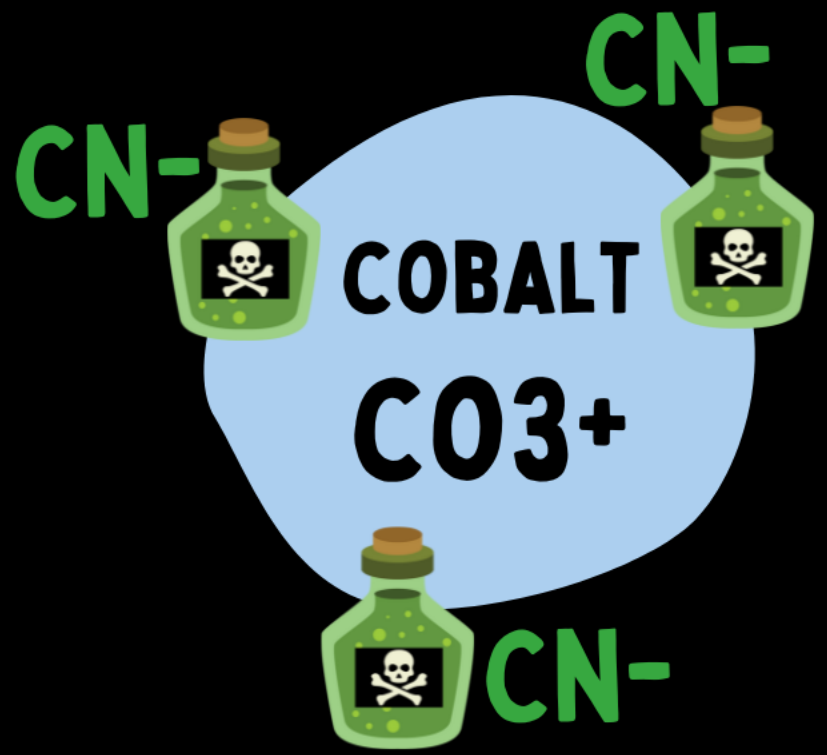
SEIZURES
COMA



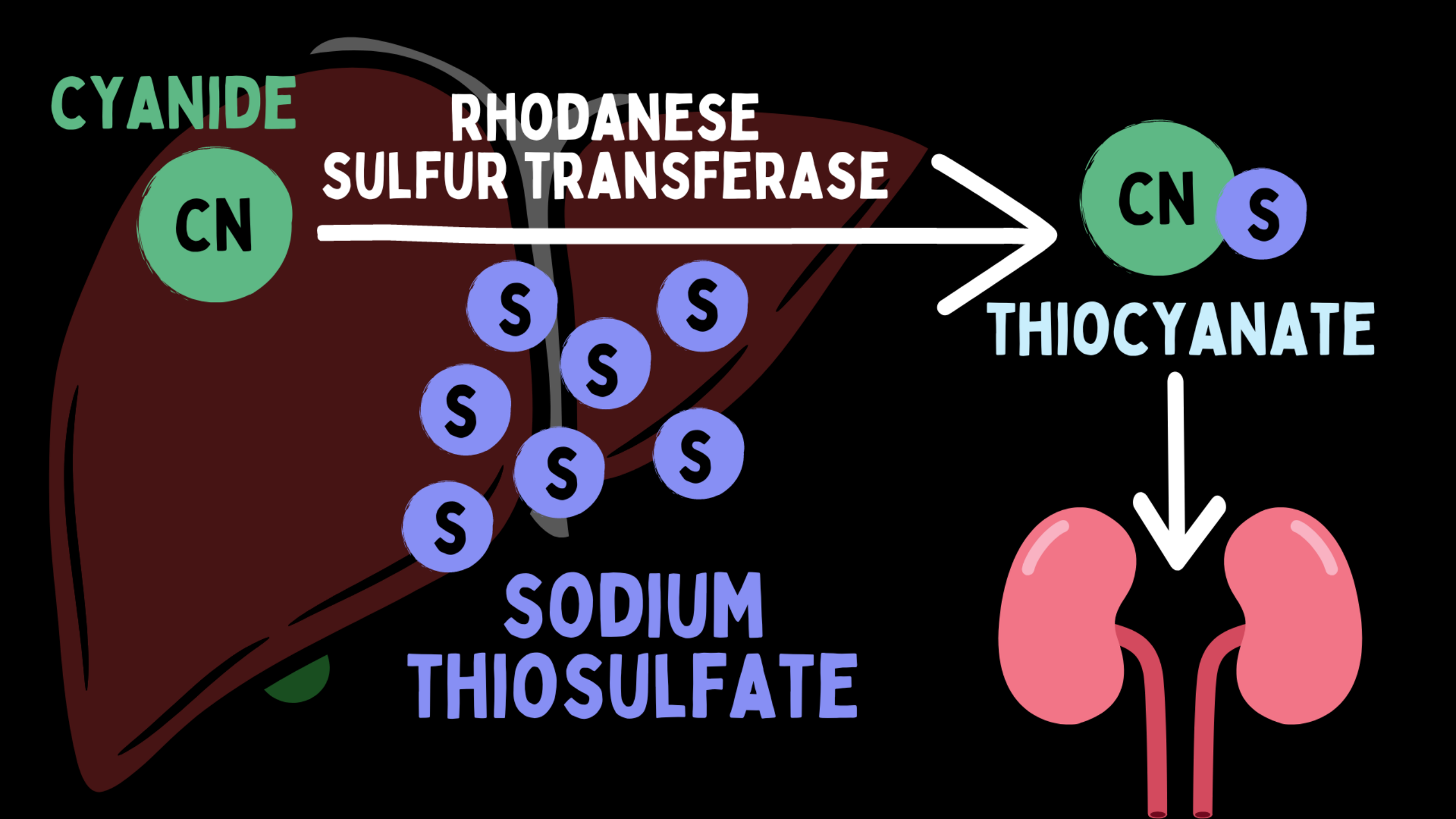
DYSRHYTHMIA
CARDIOVASCULAR COLLAPSE

HYDROXOCOBALAMIN LURES CYANIDE AWAY





CYANOCOBALAMIN IS VITAMIN B12


CYANIDE
CN
RHODANESE
SULFUR TRANSFERASE
S
S
S
S
S
S
S
SODIUM
THIOSULFATE
CN
S
THIOCYANATE

ASPHYXIANTS

PULMONARY IRRITANTS

DISSOLVE IN MUCUS

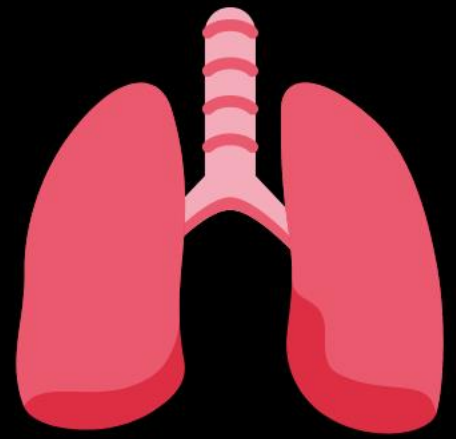
INFLAMMATORY RESPONSE

ACROLEIN	COMBUSTION	HIGHLY SOLUBLE
AMMONIA	FERTILIZER	
CHLORAMINE	CLEANING PRODUCTS	
HYDROGEN CHLORIDE	TANNING INDUSTRY	
HYDROGEN FLUORIDE	HYDROFLUORIC ACID	
HYDROGEN SULFIDE	ASPHALT, MINES	
SULFUR DIOXIDE	FOSSIL FUELS	
CHLORINE	CLEANING PRODUCTS	LESS SOLUBLE
CHLOROACETOPHENONE	TEAR GAS, MACE	
OXIDES OF NITROGEN	ANESTHETICS	
PHOSGENE	COMBUSTION	
OZONE	ELECTROSTATIC ENERGY	FREE RADICAL GENERATORS
OXYGEN	MEDICAL USE	

HIGHLY SOLUBLE GASES

LACRIMATION
NASAL BURNING

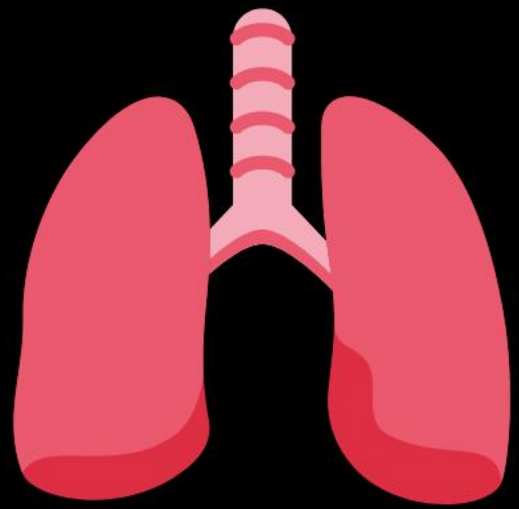
LARYNGEAL EDEMA
LARYNGOSPASM



BRONCHOSPASM
ARDS

LESS SOLUBLE GASES

PROLONGED EXPOSURE
SATURATION OF ALVEOLI
DELAYED ONSET OF SYMPTOMS



RESPIRATORY FAILURE
ARDS

ED MANAGEMENT

NO SYMPTOMS

- NO UPPER AIRWAY COMPLAINTS
- NORMAL VOICE
- NO ERYTHEMA
- NO EDEMA

OBSERVE AND DISCHARGE

MAJOR SYMPTOMS

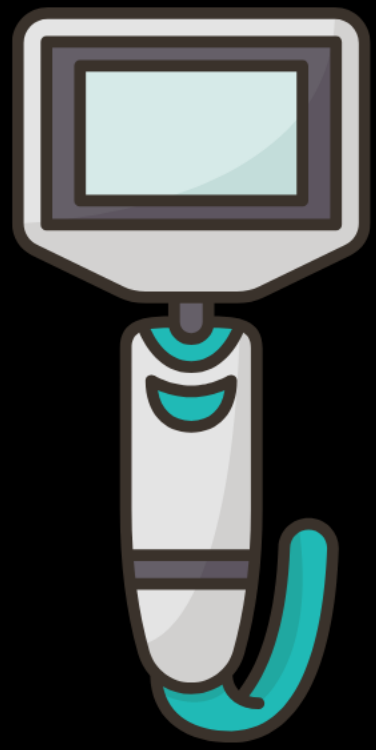
- ORAL/TONGUE EDEMA
- VOICE CHANGES
- ODYNOPHAGIA
- DYSPHAGIA

INTUBATE EARLY

ED MANAGEMENT

INTERMEDIATE SYMPTOMS

- UPPER AIRWAY DISCOMFORT
- ANY ALTERATION OF VOICE
- MILD ODYNOPHAGIA

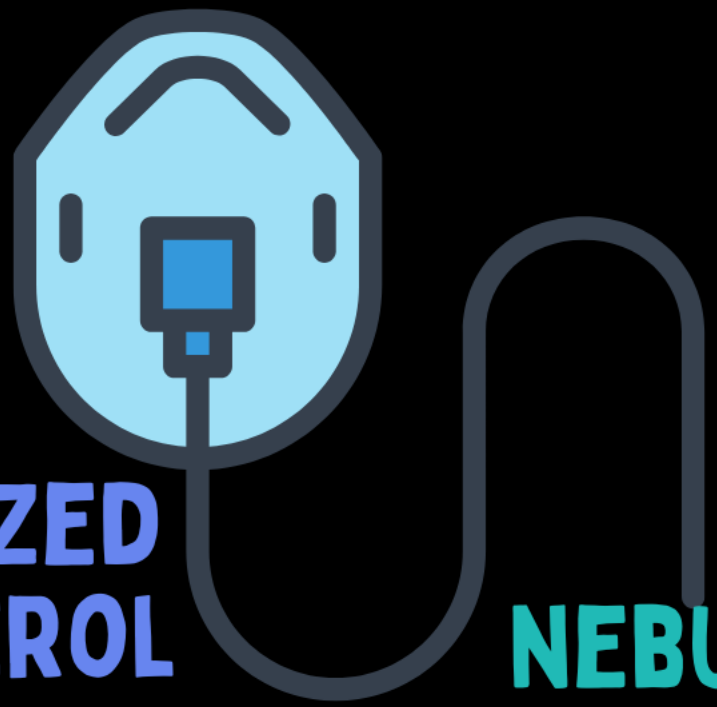


LARYNGOSCOPY

ED MANAGEMENT

BRONCHOSPASM

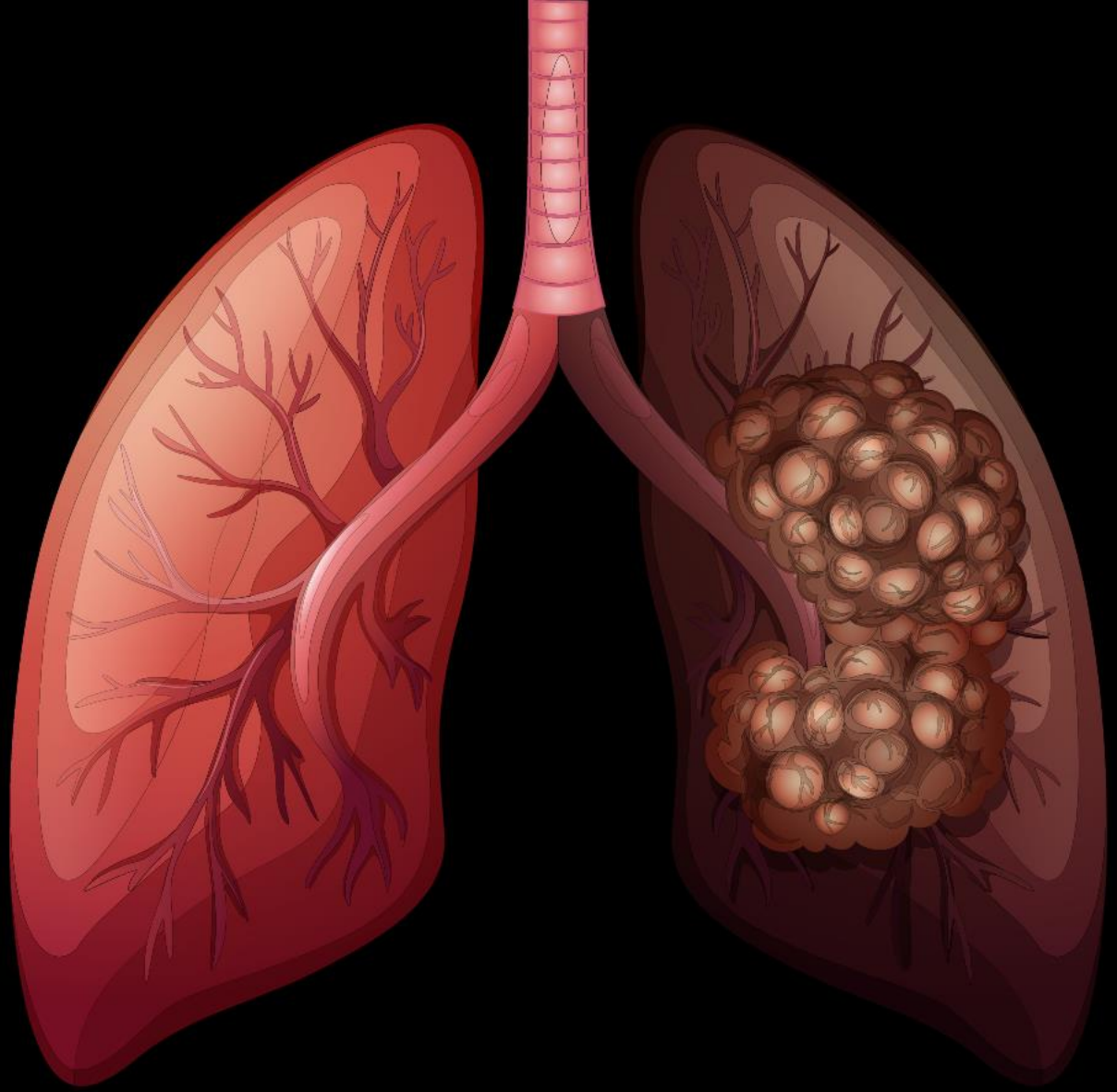
ALL IRRITANT GASES



CHLORINE
HYDROGEN
CHLORIDE

NEBULIZED ALBUTEROL

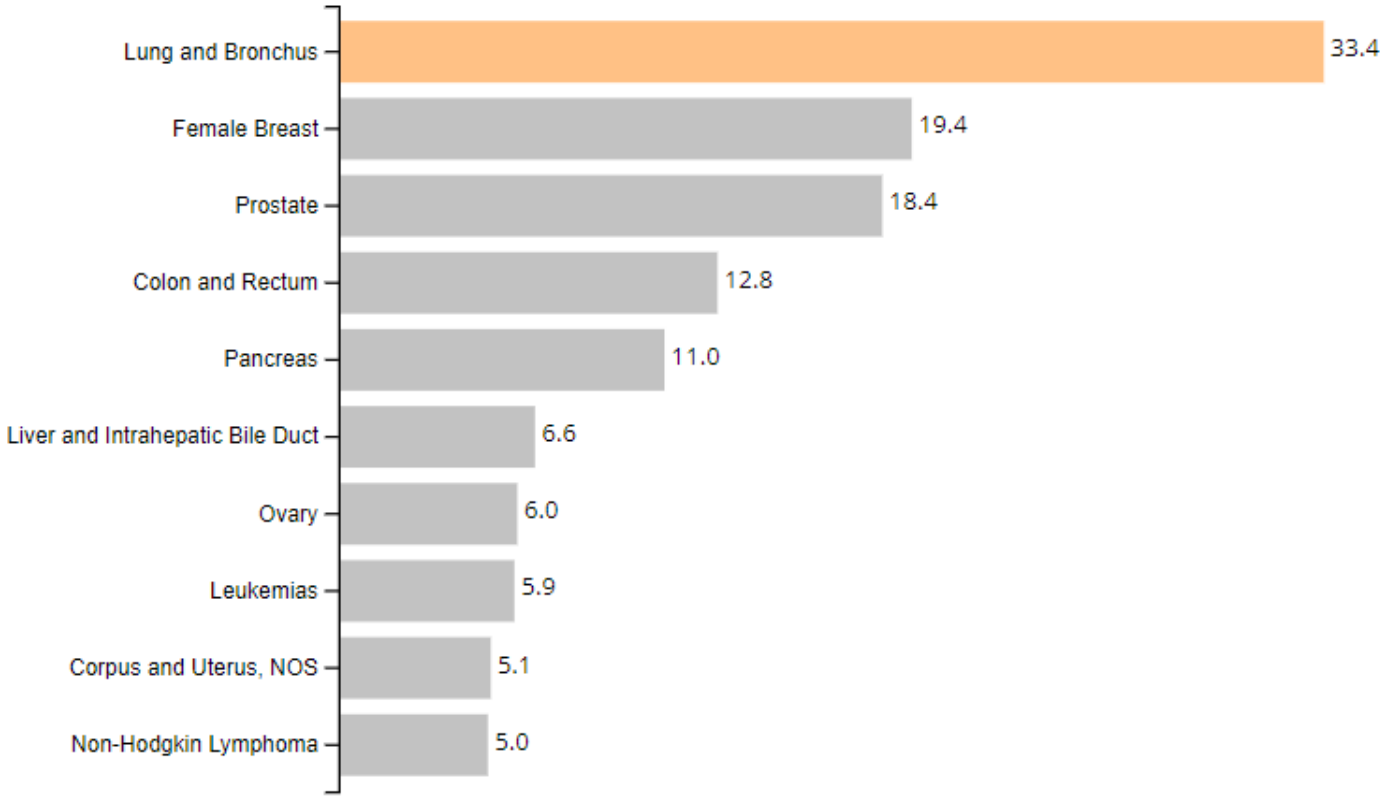
NEBULIZED
2% SODIUM
BICARBONATE



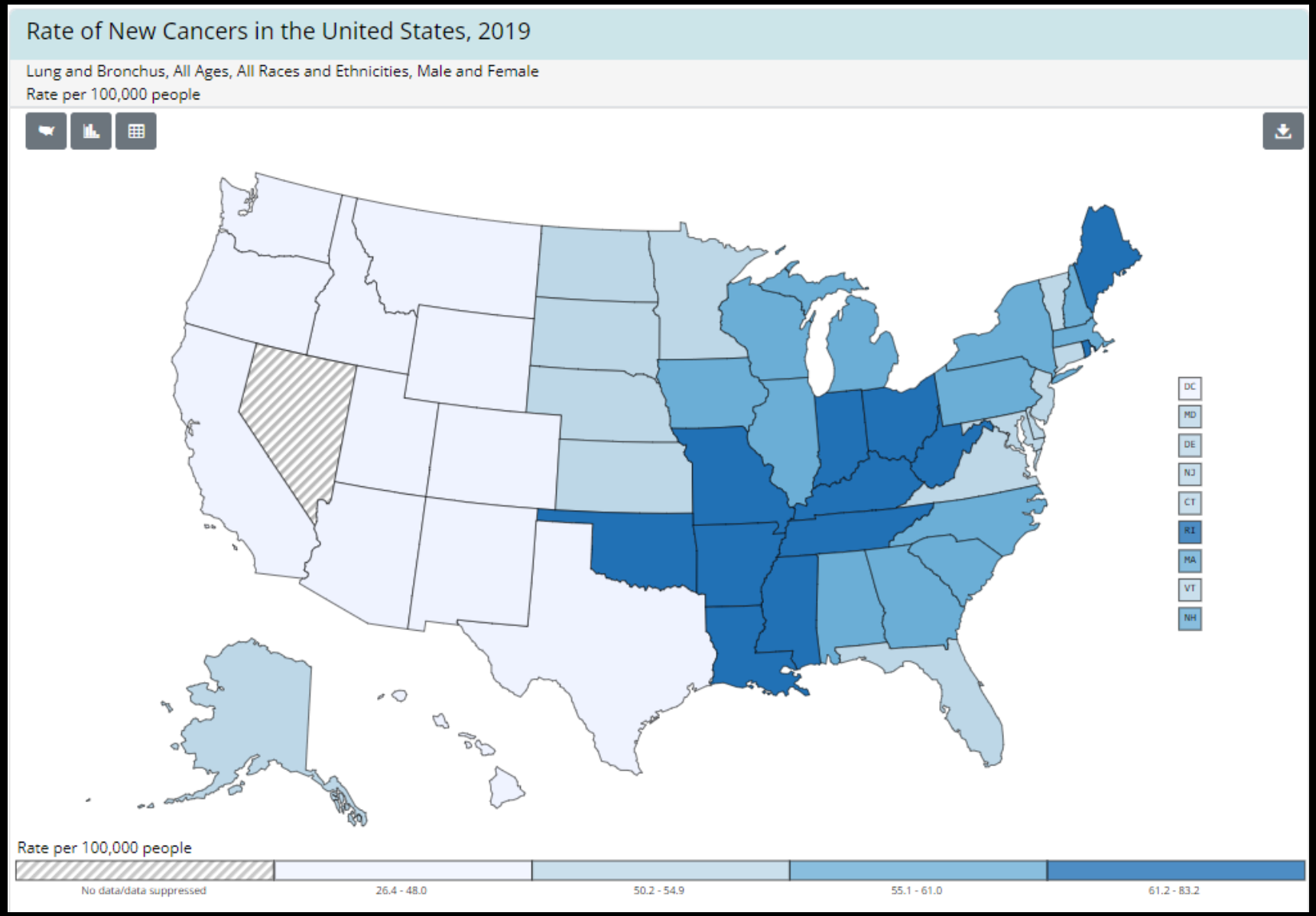
LUNG CANCER

Top 10 Cancers by Rates of Cancer Deaths

United States, 2019, All Races and Ethnicities, Male and Female
Rate per 100,000 people



U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, released in June 2022.



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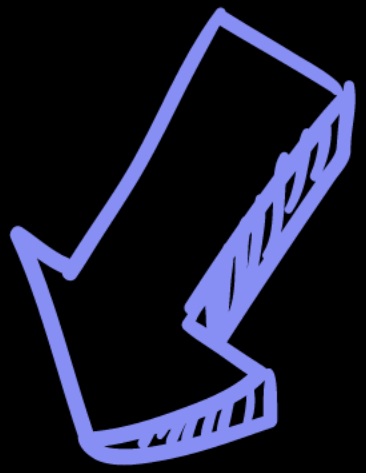
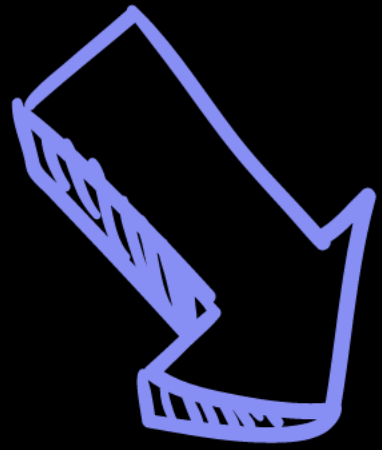
LUNG CANCER

10-15%



SMALL CELL
OAT CELL



80-85%

NON-SMALL CELL

SQUAMOUS CELL
LARGE CELL CANCER
ADENOCARCINOMA

LUNG CANCER PROGNOSIS IS POOR

MORE THAN ONE HALF OF PEOPLE DIE WITHIN ONE YEAR OF DIAGNOSIS

5 YEAR SURVIVAL RATE

18.6% ALL PATIENTS

56% LOCALIZED AT DIAGNOSIS

5% METASTASIZED AT DIAGNOSIS

Pulmonary Potpourri

TIME

Tuesday, Oct 18
11:00 AM to 11:00 AM

ROOM

Medical Staff Auditorium (MSA)