

Summer Injuries or Summer Bumpers



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Minneapolis, MN**

Summer BUMMER





Summer
Major
Bummer



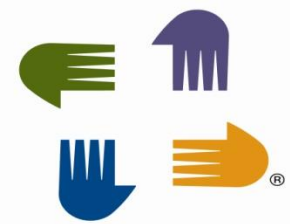


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Objectives

1. Describe common mechanisms of injury during the summer months.
2. Identify a hidden danger that may cause injury while boating.
3. Discuss key interventions for a variety of summer injuries.





Sample HCMC Summer Injuries

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Medical Center

- MVC – Fell asleep Near drowning in pool
- Hit on L side of face with baseball Hit in face walking out of bar
- Horse spooked thrown off, pelvic fx
- Ladder fall and many other home falls
- Unhelmeted MCC, another MCC crash at high speed
- Motocross and went over handle bars, TBI
- Jumped through egress window – lacerations
- Sewer ball exploded – eye injury
- Bucked off bull at rodeo
- Unhelmeted bicyclist lost control – TBI, C-spine injury
- Struck by line drive softball to jaw
- Wakeboarding and collided with another wakeboarder
- Doing wheelie on motor dirt bike when it flipped over -

Summer Injuries

- ATVs
- Bikes
- Scooters
- **Pedestrian struck**
- **Lawn Mower Injuries**
- **Sport – related**
- Water related
 - **Near Drowning**
 - **Diving**
 - **Skiing**
 - **PWC injuries**
 - **Boating Injuries**
- Hyperthermia/Hypothermia
- **Burns**
 - **Campfire**
 - **Fireworks**
 - **Lightning strikes**
 - **Tar Burns**
- Falls
 - **Out Windows**
 - Playground equipment
 - Trees
 - Flips flops

A Leading cause of
summer injury



BITES and STINGS

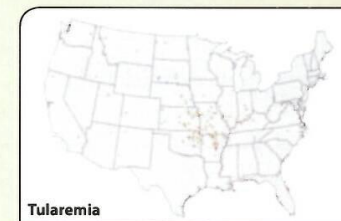
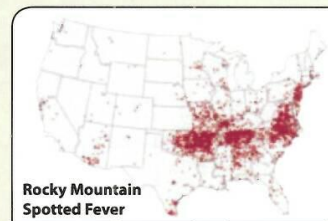
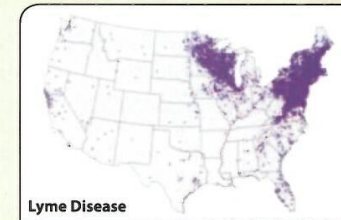
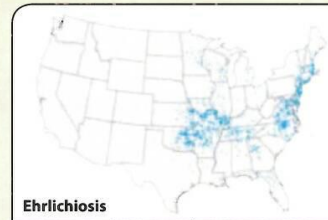
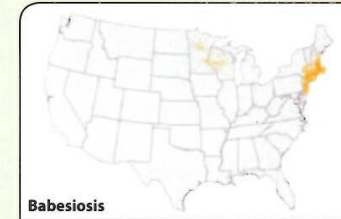
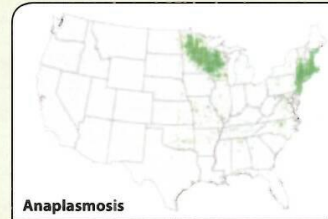
**Over 13,742 in 2014 in MN
(MIDAS)**

Tick Transmitted Diseases

- Lyme disease
- Human Anaplasmosis (HA)
- Babesiosis
- Rocky Mountain Spotted
Fever
- Ehrlichiosis
- Bartonella
- POW Virus
- Southern Tick-Associated
Rash Illness
- Tularemia

Overview of Tickborne Diseases

Selected Tickborne Diseases Reported to CDC, U.S., 2012



NOTE: Each dot represents one case. Cases are reported from the infected person's county of residence, not necessarily the place where they were infected.

NOTE: During 2012, babesiosis was reportable in Alabama, California, Connecticut, Delaware, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Oregon, Rhode Island, Tennessee, Vermont, Washington, Wisconsin, and Wyoming. CDC was not notified through the national surveillance system of cases in other states.

NOTE: In 2012, no cases of tickborne illness were reported from Hawaii. In 2012, Alaska reported ten travel-related cases of Lyme disease.

TICKBORNE DISEASES OF THE UNITED STATES

A Reference Manual for Health Care Providers

Second Edition, 2014

CDC – US Department of Health & Human Services, Centers for Disease Control & Prevention

Maps

Anaplasmosis

Babesiosis

Ehrlichiosis

Lyme Disease

Rocky Mountain Spotted Fever

Tularemia

Other Tickborne Diseases

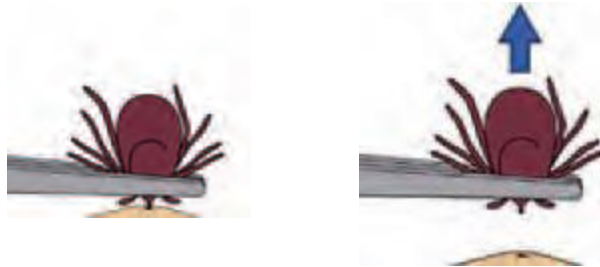
Tick Bites/Prevention

Tick Borne Illness Symptoms

- Joint pain
- Fatigue
- Malaise
- Fever & Chills
- Sweats
- Myalgias
- Arthralgias
- Headache
- Rash
- Lymphadenopathy
- Stiff Neck
- Confusion
- Cough, sore throat
- Emotional lability
- Depression
- Photophobia
- Conjunctival injection
- Mild splenomegaly or hepatomegaly
- Jaundice
- GI symptoms

Tick Treatment

**Remove tick & treat –
Doxycycline**



**Wash your hands and bite area with
Alcohol
Iodine scrub
Soap & water**

**Rash – Antibiotic
Treatment for 2 weeks**

Antibiotics for Lyme Disease

Generic Name

amoxicillin

cefotaxime

ceftriaxone

cefuroxime

doxycycline

erythromycin

penicillin

tetracycline

Brand Name

Claforan

Rocephin

Ceftin

Doryx, Vibramycin

Erythrocin, Ery-Tab

Alternative Lyme Treatments

- Saunas
- Lemon Water
- Rife machine
- Acupuncture
- Exercise

<http://www.hymbas.com/rifebcxultra.html>

Lori's Summer Bummer Story

- Body Aches all over
- Headache that was worsening
- Scratching a mosquito bite
- Day 2 – Headache intensifies & fever– goes to ED
- Day 3 – Nauseous, vomiting, can't keep anything down – goes back to ED, fluids and sent home
- Day 4 – Wakes up, headache severe and can't move the left side of her body
- Goes to ED and admitted, in coma for 2 weeks and then rehab for a month....

West Nile Virus

Mild Infection Symptoms

Most have no symptoms

- Back pain
- Body Aches
- Fatigue
- Fever
- Headache
- Occasionally:
 - Skin rash
 - Swollen lymph glands
 - Eye pain

West Nile Virus

Serious Signs & Symptoms

- High fever
- Severe headache
- Stiff neck
- Disorientation or confusion
- Stupor or coma
- Tremors or muscle jerking
- Lack of coordination
- Convulsions
- Pain
- Partial Paralysis or sudden muscle weakness

www.Mayo Clinic.com



West Nile Virus Testing

○ Lab Test

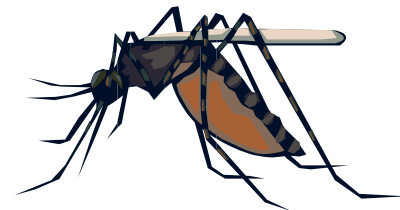
- RNA (Positive Ribonucleic acid) is indicator of the virus

○ Lumbar Puncture

- Elevated white cell count shows fighting the infection and may find West Nile antibodies

EEG – assesses brain activity

MRI – detect brain swelling



www.mayoclinic.com

West Nile Virus

Treatment Supportive Therapy

Mild

- Over the counter pain relievers to ease headaches and muscle aches

Serious

- No direct cure for encephalitis or meningitis
- IV fluid
- Prevent other infections
- Interferon therapy research – immune cell therapy for encephalitis caused by West Nile Virus

WNV Treatment Trial #1: Interferon Background

- Interferon alpha-2b
 - Used to treat Hepatitis C (related virus)
- In vitro:
 - Interferon alpha-2b inhibited replication at relatively low concentrations
- Animal studies*:
 - Increased mean survival time of SCID-treated mice infected with related flavivirus
 - Reduced viral RNA in serum, brain and spleen
- Proposed Mechanism
 - Stimulates cellular antiviral activity, enhances body's host defenses (anti-viral replication has also been proposed as mechanism of action)

Mosquito Transmitted Diseases

Region:

- West Nile Virus
- LaCrosse Encephalitis – 4-5 cases/year
- Jamestown Canyon Virus -
- Western Equine Encephalitis – no human identified
- St. Louis Encephalitis – last seen in the 1970's

From other countries and regions:

Zika

Malaria

Yellow Fever

Dengue

Chikungunya

www.health.state.mn.us/divs

Other Pests

○ Head Lice

○ Pubic Lice

○ Bed Bugs

○ Asian Lady Beetles

○ Fleas

○ Cockroaches

○ Black Flies

○ Deer/Horse Flies

○ Spiders

○ Scabies

○ Bird Mites

○ Delusional Parasitosis

○ Swimmer's Itch

Sunburn Treatment

- Stop the Burning process
- Get out of sun
- Apply moisture
 - Humectants
 - Help retain moisture
 - Avoid Emollients
 - Oils & greases
 - Vit A & E oils are good in moisturizers
 - Noxema is still good to use!
- Bacitracin if blisters open

Tar Burns

- Boiling point is 140-232 degrees C
- Cools quickly to 93-104 degrees C
- Cool with NS or water at room temperature
- Picked, Peeled and debrided from tissue
- Petroleum or ointments to aid removal
- Mayo, butter , sunflower seed oil, baby oil can help



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Campfire Injuries



STOP...DROP....& ROLL



Mtlfd.org

Firework Injuries

Most Injured body parts

46% Hands & Fingers

17% Heads, faces, ears

17% Eyes

11% Legs

4% Arms

Type of Firework

17% Sparklers

14% Reloadable shells

13% Firecrackers

7% Roman Candles

6% Bottle Rockets

6% Novelties

2 % Multiple Tubes

1% Fountains

3% Public Display

29 % Unspecified



Firework Injuries by Age

Percent by years of age

○7% -	0-4
○9% -	5-9
○10% -	10-14
○10 % -	15-19
○9% -	20-24
○40% -	25-44
○14% -	45-64
○1% -	65+



Photo by Jake Stehli

Lightning strikes are the second leading environmental cause of death (behind flash floods) in the United States, with an average of 50-300 deaths per year.



Photo by Greg Miller

Lightning Injuries

Vasomotor spasm

Vasomotor spasm is the local response of the vasculature to electrical current from direct sympathetic stimulation. Vasoconstriction may be so prolonged and intense that it causes early and severe loss of pulses and mottled, cool extremities. This vasoconstriction is usually self-limited and resolves within hours.

- **CPR, EKG**
- **Assist breathing**
- **Circulation – Aggressive IV fluids**
- **Foley to Monitor Urine Output**
- **Watch for dark urine**
- **Treat external burns**

6 potential physical ways of Lightning strikes the body

- Direct Strike
- Contact voltage
- Side splash
- Step voltage
- Upward Streamer
- Blast injury



Photo by Mick McGuire

Lightning Strike Treatment

- Call 911
- Help person when safe
- CPR if needed
- Treat burns and shock
- Stop Burning process
- Transport for medical evaluation - internal and neurological injuries and burns
 - IV fluids to flush tissue breakdown
 - Cardiac monitor
 - Monitor Urine <http://www.webmd.com/first-aid/lightning-strike-treatment>

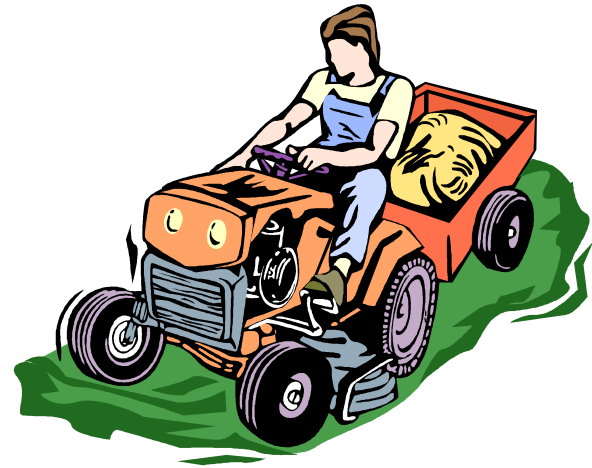
Lawnmower Injuries



- All types of injuries occurred and all body parts are injured
- 7% of the injuries are amputations and avulsions.

- 31% HANDS & FINGERS
- 19 % LEGS
- 18% FEET/TOES

Mean age – 9 years



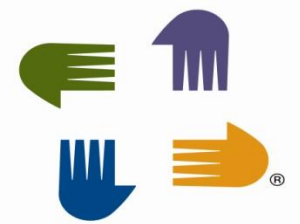
Lawnmower precautions

- Long hair should be tied up
- Use proper eye protection
- Use proper hearing protection
- Wear non-skid closed toed shoes
- Operate the lawn mower
 - Only during daylight hours
 - Not in bad weather
 - In a location with no hazards such as slopes, ditches, stumps, gravel, downed tree limbs, etc.



Lawnmower Age Recommendations

- Most children and adolescents will not be able to operate:
 - A hand mower until at least 12 years of age
 - A walk-behind power mower until at least 12 years of age
 - A ride-on power mower until at least 16 years of age

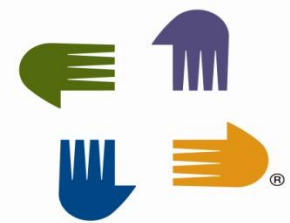


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Pedestrian Struck

5 year old walking and run over by vehicle

○ No pulse and chest compressions started enroute



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Discharge Diagnosis

- Splenic laceration
- Liver laceration
- Bilateral pulmonary contusion
- Traumatic pneumothorax
- Aspiration pneumonia
- Altered level of consciousness
- Traumatic brain injury
- Cardiopulmonary arrest
- Motor vehicle collision with pedestrian
- Contusion of chest wall
- Contusion of pelvis
- Abrasions of multiple sites
- Acute hypokalemia
- Fracture of pubic ramus
- Cardiac contusion
- Elevated troponin level
- Fracture of elbow, condyle, right, closed
- Traumatic pneumothorax on right
- Traumatic pneumothorax on left
- Liver laceration, grade III, without open wound into cavity
- Laceration extending into parenchyma of spleen without open wound into abdominal cavity - Grade III

Baseball or Golf ball to Eye

Control bleeding

Minimize eye movement

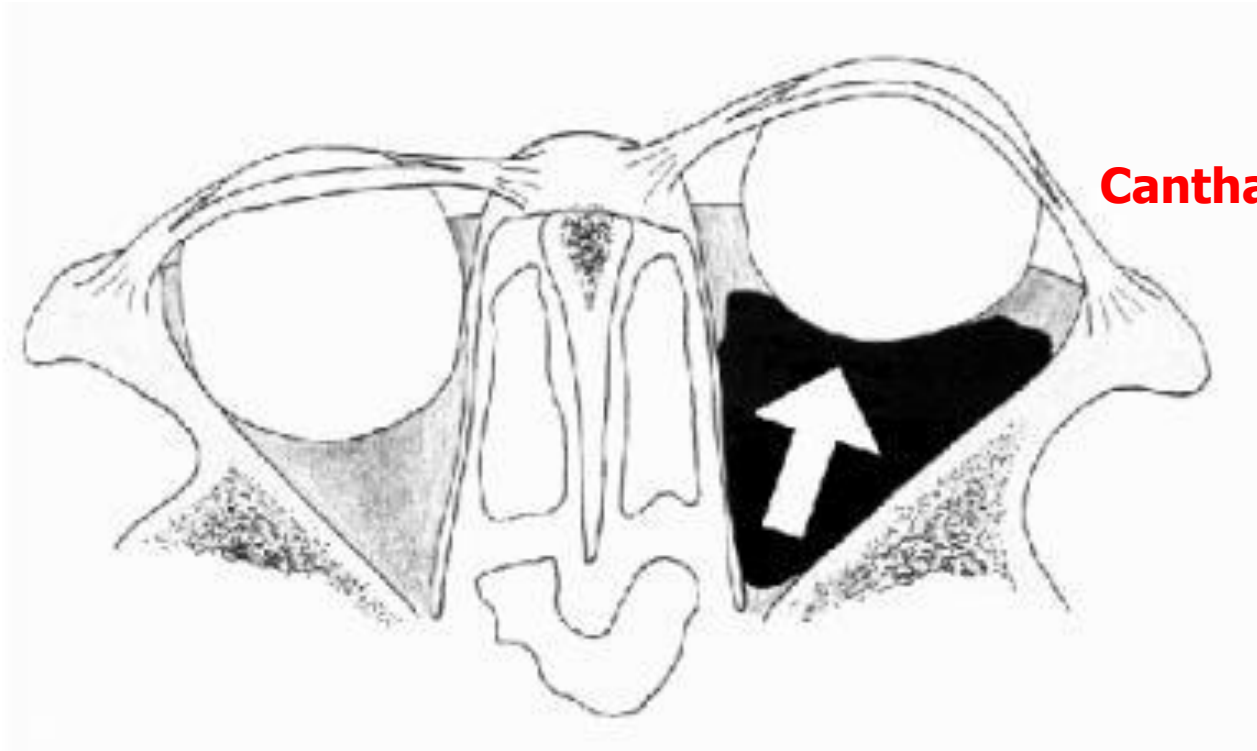
Patch other eye

Don't ultrasound a ruptured globe

Leave eye contents intact - if have
fluid coming out of eyeball, don't
remove

Ice for swelling to eye brow area.

Cantholysis/Canthotomy

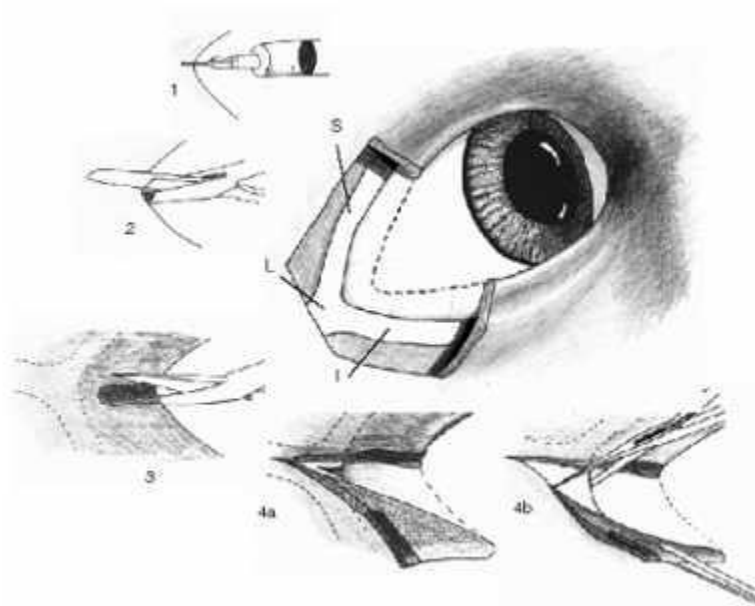


Canthal tendons

<http://www.cjem-online.ca/v4/n1/p49>,

Illustration by Dr. Daniel Howes

Canthotomy



<http://www.cjem-online.ca/v4/n1/p49>

Illustration by Dr. Daniel Howe

Types of Accidents on Water

Accident Type	# of Accidents	# of Deaths	# of Injuries
Collision with recreational vessel	937	40	652
Flooding/Swamping	463	70	139
Collision with fixed object	452	51	355
Grounding	359	13	235
Skier Mishap	292	8	305

Factors Contributing to Accidents*

ENA/US Coast Guard

Recreational Boating Injury Report 2014

Contributing Factor	# of Accidents	# of Deaths	# of Injuries
Operator Inattention	563	38	370
Improper Lookout	431	26	321
Operator Inexperience	391	44	256
Excessive Speed	292	23	267
Alcohol use	277	108	248

Boating accident claims life

By Kerri Rempp

Record Editor

Aug 18, 2015

Pennington County Sheriff's Office water rescue team searches Pactola Lake for woman thrown overboard when her PWC collided with a boat

Boating Rescue

- Wear your Life Jackets
- Use Buoyancy to help get into the boat
- Self, Reach, Throw, Row, Go
- Consider having a protocol on when to stop looking for a victim of a potential drowning



Sample Cases of Drowning HCMC Trauma Registry

- Swimming Laps in Apartment Pool, found at bottom
- Found at bottom of swimming pool
- Swept into Mississippi storm sewer tunnels
- Found unresponsive in bathtub x3,
 - one held under by father
- Swimming in hotel pool and found unresponsive
- Jumped into 8 foot of water, came to surface and sank- non-swimmer
- In car that rolled and was submerged in water

Drowning

Process resulting in primary respiratory impairment from submersion in a liquid medium

Liquid-air interface at the opening to a patient's airway

- Time in Water
- Quantity of water aspirated
- Quality of water aspirated- fresh, salt, mud
- Co-morbidities
- Water Temperature
 - Cold drowning <20 C
 - Warm drowning >20 C

Interventions After Drowning

- Airway with C-spine immobilization
- CPR – start chest compressions
- Airway
 - Insertion of oral or nasal airway
- Breathing – augment with Bag Valve mask
 - CPAP
 - BiPap
 - Consider Intubation
 - Peep
 - Consider ECMO

Secondary Drowning

Indications for Intubation

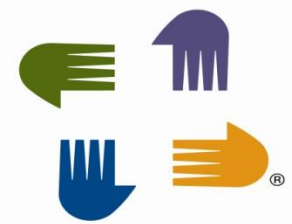
- Altered LOC
- Can't protect airway or handle secretions
- High alveolar needs
- O₂ sats of < 80%
- PaCO₂ > 45
- ABG's are getting worse



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Tubing Injuries

- Radiculopathy shoulder with brachial plexus injury
- AC separation
- Lumbar spine fracture x3
- Foot, knee, and elbow abrasions
- Grade IV liver laceration, pulmonary contusion, pulmonary effusion
- L meniscal tear and knee strain
- Arm & nose contusions
- Degloved posterior gastrocnemius



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Personal Water Craft (PWC) Case

○ Patient on Personal Water Craft talking with friend. Another friend on another PWC tries to join in on the conversation. When loses steering when gliding in without power, patient guns it and goes over top of friend's PWC, striking friend in head.



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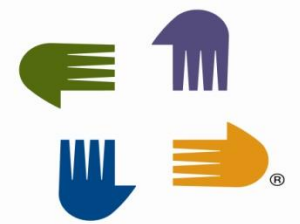
PWC Injuries

- Right rib fractures
- L1-5 transverse process fractures
- Splenic laceration
- Hematuria
- Subarachnoid hemorrhage
- Chest wall contusion
- Fractured facial bones, right tripod fractures of zygoma, facial lacerations
- Groin hematoma
- Rectal perforation

Authorities: CO poisoning that killed 7-year-old girl caused by hole in boat's exhaust pipe

- Animals probably chewed the hole, investigators say.
- Investigators said Friday that the 7-year-old girl who died from carbon monoxide poisoning on a Lake Minnetonka boat earlier this week had been resting in the boat's cabin where there was a hole in the exhaust pipe.
- The Hennepin County Sheriff's Office said Friday that the hole was underneath the mattress area in the lower cabin area and was likely caused by animals chewing through the pipe. Sophia Baechler, 7, of Edina had gone below deck to rest because she wasn't feeling well, the Sheriff's Office said, and was found "in distress" about 10 minutes later.
- Wayzata police responded to the family's boat as it docked into Wayzata Bay on Sunday and found the boat occupants giving the girl CPR

<http://www.startribune.com/authorities-co-poisoning-that-killed-7-year-old-girl-caused-by-hole-in-boat-s-exhaust-pipe/333236061/>



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Unresponsive Boating Victims

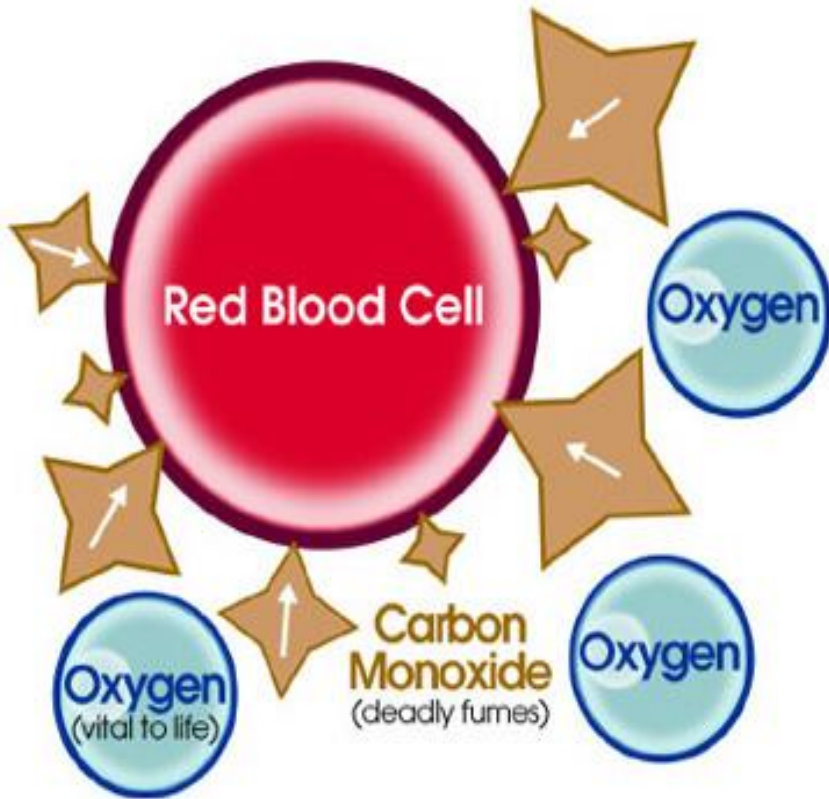
- 5 year old on the back of the boat hanging onto the platform while “Teak Surfing”.
- 16 year old at the back of a boat lying on cushion near motor, listening to the radio and taking a nap before the fireworks.
- 18 year old at the back of the boat lying on cushion partying friends unable to wake her

CO Boating Victims

- Houseboat
- Personal Water Craft
- Cabin Cruiser
- Open Motor Boat – Teak Surfing
- Small Fishing Boat
- Boat Shower
- Walking in Channel
- Swimming in back of boat



Impaired Oxygen Delivery



- Hemoglobin likes CO 220 times better than O₂ and Binds to it readily
- CO prevents hemoglobin from taking up oxygen and removing CO₂, leading to tissue hypoxia
- Organs with high blood flow and oxygen needs are most effected

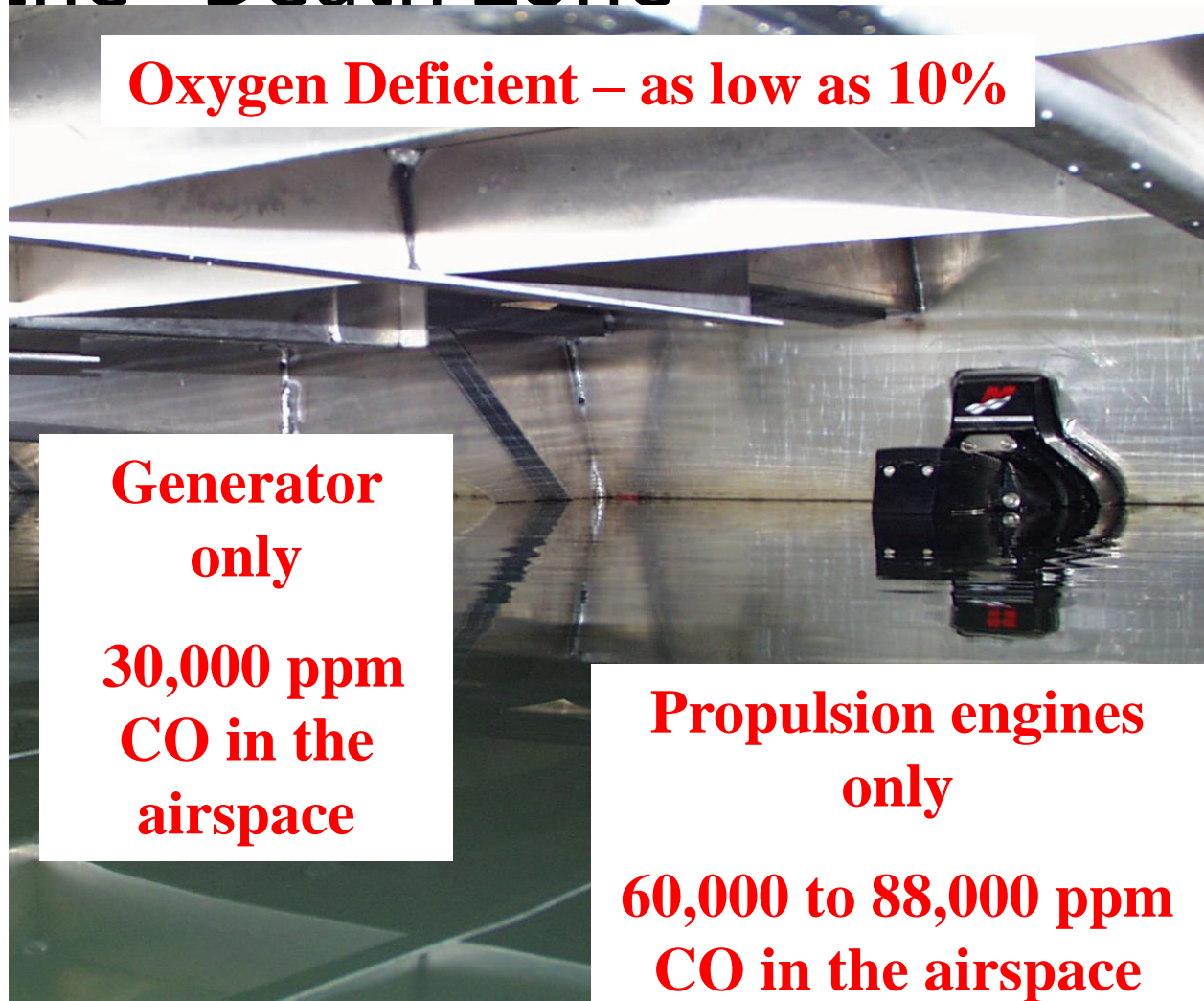
CO in parts per million / Symptoms

200	Mild headache, fatigue, nausea, dizziness and confusion
800	Dizziness, nausea, convulsions- 45 min; Death- 2 hours
1,200	Immediately dangerous to life and health
6,400	Death in 10 to 15 minutes
12,000	Immediate death

In the “Death Zone”

Fatality Examples

**50% to 70% COHb
in
3 to 10 minutes of
exposure**



Oxygen Deficient – as low as 10%

**Generator
only**

**30,000 ppm
CO in the
airspace**

**Propulsion engines
only**

**60,000 to 88,000 ppm
CO in the airspace**

Treatment for CO Poisoning

100% Oxygen

Via non-rebreather mask or other means as appropriate.

Monitoring and Labs

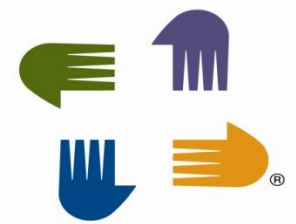
- COHb on arrival
- ABG's
- Labs: glucose, CPK with isoenzymes, SCr, BUN, Etoh, U/A, Urine Tox Screen
- CXR
- CT or MRI if neurologic symptoms develop or persist
- EKG
- Consider HBO

Carbon Monoxide Kinetics

○ On room air the $T_{1/2}$ is 5-6 hours

○ With 100% O_2 by tight-fitting mask: $T_{1/2}$ is 1-2 hours

○ HBO at 2.5 atm – the $T_{1/2}$ is ~20 minutes

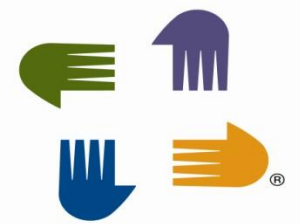


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HBO –

Hyperbaric Oxygen Chamber



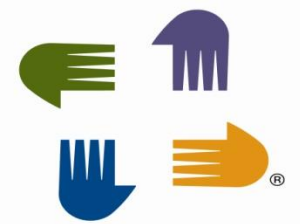


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**CO from Weed
eaters and
trimmers
Small powered
engines**

In honor of Mother & Father's DAY

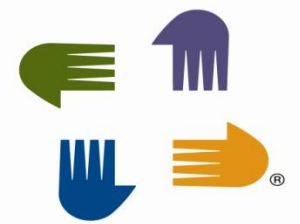
- Grilling
 - Check hoses for cracking
 - Brittleness
 - Holes & Leaks
 - Don't let grease drip on them
 - If smell gas – check for leaks – Open gas supply valve fully –Apply One part water & one part detergent with a brush at connections. If see bubbles, there is a leak.



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Fish hook Removal

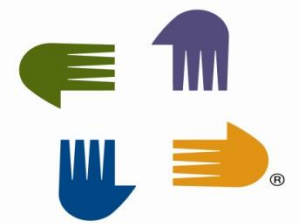
- Rip and Pull method
- String Pull method
- Pinch the Barb method
- Cut off the Barb method



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Summer Safety Tips Summary

- Put sunscreen on
- Wear repellent with DEET
- Check for Ticks
- Go inside strong structure if storming
- Wear your helmet while biking or on a motorcycle or ATV
- Protect your eyes while golfing or playing sports
- Don't use accelerants on fires
- Don't wear flip flops while mowing
- Watch for children running into the street when driving
- Don't swim too close behind your boat
- Wear your life jacket



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Karie Pearce

Trauma & Critical Care Services
Level I Adult & Pediatric Trauma Center
ACS & ABA Verified Burn Center
Hennepin County Medical Center
Minneapolis, MN

Contact: karie.pearce@hcmcd.org

612-873-3449

Hope you have a great summer! Have FUN!!!!



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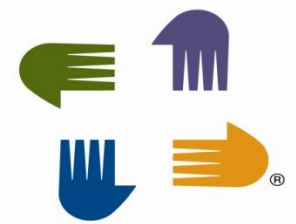
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www.dnr.state.mn.us/boating

www.ena.org

<https://www.uscgboating.org/library/accident-statistics/Recreational-Boating-Statistics-2014.pdf>