

Objectives

- Overview of glucometer use and troubleshooting equipment
- Understanding signs, symptoms and treatment for diabetic keto-acidosis
- Understanding signs, symptoms and treatment for hyperglycemic hyperosmolar state
- Understanding signs, symptoms and treatment for graves disease
- Understanding signs, symptoms and treatment for thyroid storm
- Understanding signs, symptoms and treatment for addison crisis

Glucometer

- The meter displays 20-600 mg/dl
- Operating Temperature 50-104F (10-40C)



Glucometer

- Proper usage is important!
 - Make sure it is not too cold
 - Make sure you let the alcohol swab dry

Error Messages

Er1: A used test strip was inserted.
Repeat the test with a new test strip.

Er2: The blood or control solution sample was applied before the ▲ symbol appeared.
Repeat the test with a new test strip and wait until the ▲ symbol appears before applying the blood or control solution sample.

Er4: The blood sample has abnormally high viscosity or insufficient volume. Repeat the test with a new test strip.

Er5: This error message may appear when the wrong blood glucose test strip is used instead of an Assure Prism multi Blood Glucose Test Strip. Repeat the test with an Assure Prism multi Blood Glucose Test Strip.

Er6: There is a problem with the meter.
Do not use the meter. Contact Customer Service at 800.818.8877, 24 hours a day, 7 days a week, USA and Canada.

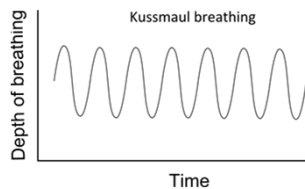


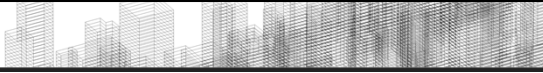
Diabetic Ketoacidosis (DKA)

- Usually occurs with type I diabetes
- DKA will have levels of 300 mg/dl or higher
- "Poly-s"
 - Polyuria - urinate a lot
 - Polydipsia - drink a lot
 - Polyphagia - eat a lot

Diabetic Ketoacidosis (DKA)

- Kussmaul breathing - trying to offset the acidosis by removing CO₂
 - Deep and rapid breathing
- Alcohol or Ketone smell
- Potential Potassium issues
 - Cardiac monitoring





Diabetic Ketoacidosis (DKA)

- Causes
 - Stress
 - Missing Insulin doses
 - Illness

Hyperglycemic Hyperosmolar State (HHS/HHNS)

What is the difference between this and DKA?

- Usually with type 2 diabetics
- Still processing some glucose -> so no breakdown of fats
- No Kussmaul breathing; no ketone breath
- Slow onset
- Often with altered mental status
- Often caused by infection or illness

Hyperglycemia treatment

- Fluid resuscitation with normal saline. Repeat as needed to effect age appropriate systolic blood pressure
- Contraindication: evidence of CHF



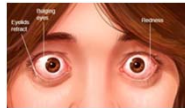
Hyperglycemic patient scenario

- Patient asks, "I have insulin. If my blood sugar is high, then can I just take that and stay home?"



Graves Disease

- Form of Hyperthyroidism
 - Occurs when the thyroid gland becomes hyperactive and secretes too much thyroxine
- Most common in women under the age of 40
- Signs and symptoms
 - Anxiety and irritability
 - Heat intolerance
 - Malaise, tiredness, weakness
 - Weight loss
 - Frequent bowel movements
 - Rapid or irregular heart rhythms
 - Goiter of the neck
 - Bulging eyes
 - pretibial myxedema



Graves Disease

- Can lead to
 - Atrial Fibrillation, vision loss, heart failure, stroke
- Do a stroke scale!

Thyroid Storm

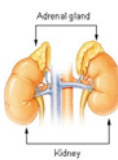
- When there is an overwhelming amount of thyroxine circulating the body thyroid storm occurs
- Common Causes
 - Undiagnosed or untreated hyperthyroidism (such as Grave's disease)
 - Illness, trauma, or stress
 - Taking other medications that increase thyroid activity level (ASA, radioactive iodine)

Thyroid Storm

- Signs and Symptoms
 - Altered mental status
 - Hypertension
 - Tachycardia
 - Tachypnea
 - Hyperthermia
- Treatment
 - IV bolus
 - Dextrose as needed
 - Cooling

Addison's disease/Hypocortisolism (Adrenal Crisis)

- Addisonian Crisis accounts for 15% of deaths in patients with Addison's disease
- Signs and Symptoms
 - Sudden penetrating pain in large muscle groups
 - Nausea
 - Vomiting
 - Diarrhea
 - Hypotension
 - Syncope
 - Hypoglycemia
 - Seizure
 - Fever
 - Cardiac dysrhythmias
 - hyperkalemia

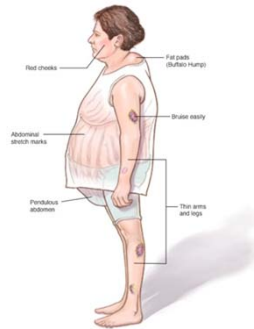


Addison's disease/Hypocortisolism (Adrenal Crisis)

- Treatment
 - Good BLS airway management
 - Aggressive IV bolus therapy
 - Multiple doses of dextrose* (medical control order)
 - **Maximum Dextrose administration is 50mL of age-appropriate concentration. Additional amounts must be authorized by On-Line Medical Control.**
 - Prednisone*/Solumedrol* (medical control order)

Cushing's Syndrome

- Excess cortisol
- Often related to steroid medication abuse or iatrogenic overuse
- Common symptoms
 - Central obesity
 - Thin frail skin
 - Purple or red striae on trunk, buttocks, arms, legs or breasts



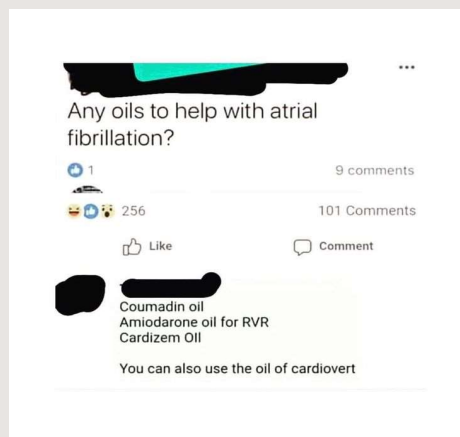


Thank you

ayoon@co.lucas.oh.us



It's All Natural....



Objectives



Identify who uses alternative therapies



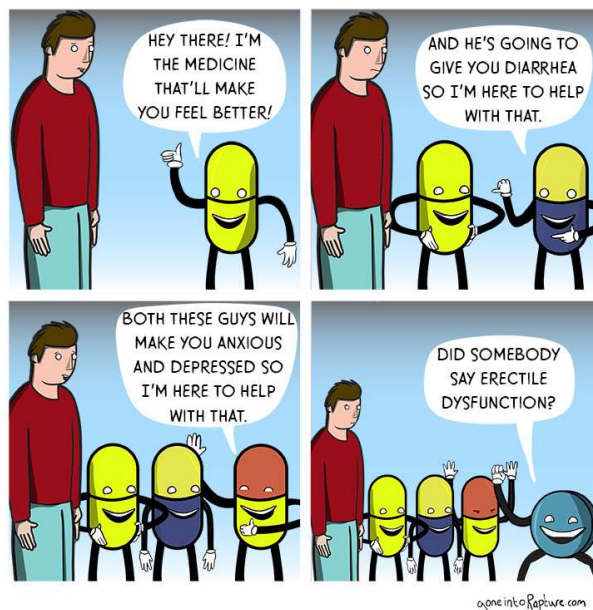
List reasons alternative therapies benefit the immune response



Identify types of alternative therapies



List adverse effects of herbal medications





SIDE EFFECTS

Dry mouth, dizziness, cramps, rashes, impotence, stroke, V.D., bad credit, fever, memory loss, anal leakage, joint pain, ill fitting shoes, heart attack...

motifake.com

Maybe I'll just live with my itchy eyes

I'd recommend regular exercise and healthful nutrition, but I know you won't do that...

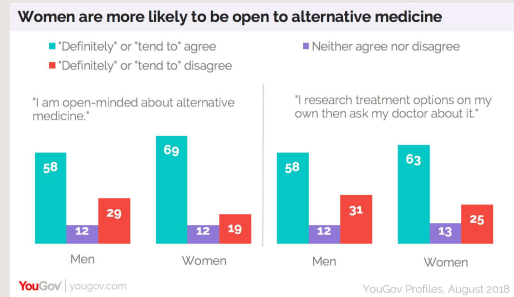
So here's a prescription for a bunch of pills.

yourrecards.com



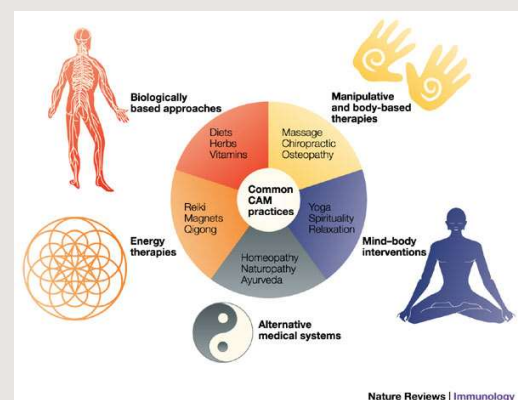
Characteristic Users

- Female
- Middle aged
- Well educated
- Middle class
- White



Alternative Medicine

- Acupuncture
- Chiropractic medicine
- Massage therapy
- Cupping
- Mind-Body Medicine
- Energy Therapy
- Herbal medicine
- Homeopathic medicine



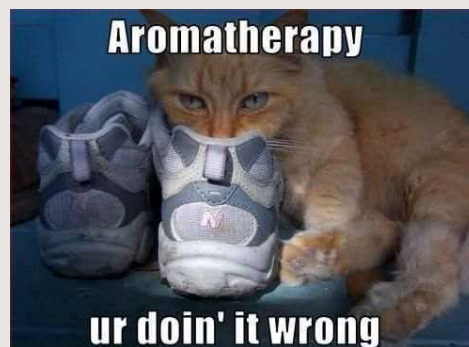
History

- 200-year-old therapeutic system
- Goal: stimulate self-healing
- Provided alternatives to "abusive treatments"
- Current day homeopathic medicine
 - Individualized care plans
 - Time
 - Inexpensive
- Individual research



Herbal Medications

- Not regulated by the FDA
- Cranberry and UTI's!!!!
- Family traditions
- Adverse effects - What???
 - Toxicity
 - OD
 - Herb contamination
 - Interactions



Interactions

PHARMACOKINETIC

- Interactions between herbal supplement and a drug
- Affect the drug concentration

PHARMACODYNAMIC

- Direct actions between the drug and the supplement
- Does not affect drug concentration
- Antagonizes or exacerbates the effect of the drug



What might people be taking???



Saffron

- Stem-less herb
- Cardioprotective effect
- Reduces cholesterol
- Effects comparable to amiodarone
- Inhibits some cancer cell proliferation
- Side Effects: Anxiety, anorexia, H/A, N/V, constipation, tachycardia, tremors, sexual dysfunction
- **Provider Warning:**
Causes renal/liver injury
Spontaneous abortion



Ginger

- Cardioprotective
- N/V
- Mechanism of action?
- **Provider Warning**
Significant increase in Fibrinolytic activity
Mild GI side effects



Garlic

- Antineoplastic effects –
Stomach/colon/lung
- Cardiovascular benefits
- **Provider Warning**
 - Digitalis toxicity
 - Anticoagulant issues
 - CNS bleeding
 - Burns
 - GI



Hawthorn

- Cardioprotective
- **Provider Warning:**
 - Enhances Digitalis activity



Ginkgo Biloba

- Antioxidant
- Inhibits platelet aggregation
- Improves cognitive function
- **Provider Warning:**
Spontaneous bleeding
- Monitor for bruising, bleeding, new-onset h/a, vision changes



St. John's Wort

- Natural antidepressant
- **Provider Warning:**
Half-life 24-48 hours
Effects in vitro
- Drug/Drug interactions
- Side effects: Dry mouth, dizziness, anxiety, confusion, diarrhea, constipation, GI discomfort, fatigue, itching, erythematous lesions



Ginseng

- Advertised to:
 - Strengthen normal functions
 - Improve sexual function
 - Increase resistance to stress
 - Increase energy
- **Provider Warning:**
 - Herb to anticoagulant interaction
 - Decrease blood sugar



Milk Thistle

- Utilized as:
 - Cytoprotectant
 - Anticarcinogen
 - Supportive care for liver disease (cirrhosis)
- **Provider Warning:**
 - Side effects: GI disturbances, rashes, allergic reactions.
 - Decreases the concentration of: Dilantin, Valium, Warfarin*



Black Cohosh

- Used for menopause symptoms
- **Provider Warning:**
Side effects: GI distress, rashes, breast pain, vaginal bleeding, musculoskeletal aches, dark urine, jaundice
Reduces the effectiveness of amiodarone



Goldenseal

- Most popular
- Uses: cold symptoms, pink eye, diarrhea, UTI's, canker sores, and vaginitis
- Positive drug test????
- **Provider Warning:**
Increases effects of digoxin and blood thinners
Decreased metformin
Toxic to newborns



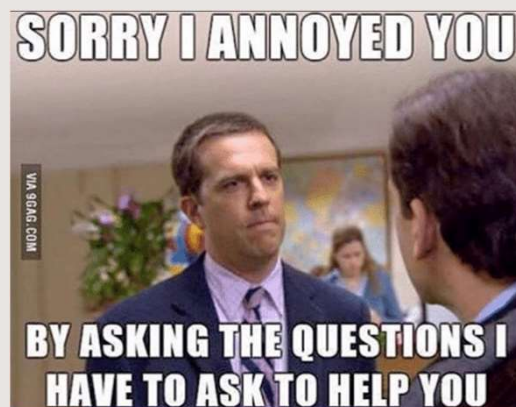
Kava Kava

- Herbal sedative
- Provider Warning:
 - Extrapyramidal effects –dyskinesia and torticollis
 - Increased bleeding with Coumadin
 - Inhibits Dilantin and Depakote
 - Enhanced effects with Xanax and Tagamet
 - Skin effects with sun exposure



When it comes to herbal meds, questions to ask.....

- Are you taking an herbal product, supplement, or other natural remedy?
- Are you taking any prescription or nonprescription medications for the same purpose as the herbal product?
- Have you used this herbal product before?
- Are you allergic to any plant products?
- Are you pregnant or breast-feeding?





HOMEOPATHIC FIREFIGHTER



HOW WOULD YOU DEFINE SEPSIS?

- SEPSIS IS...
 - THE BODY'S EXTREME RESPONSE TO AN INFECTION
 - A LIFE-THREATENING MEDICAL EMERGENCY
 - SEPSIS HAPPENS WHEN AN INFECTION YOU ALREADY HAVE TRIGGERS A CHAIN REACTION THROUGHOUT YOUR BODY
 - INFECTIONS THAT LEAD TO SEPSIS MOST OFTEN START IN THE LUNG, URINARY TRACT, SKIN, OR GASTROINTESTINAL TRACT (INFECTIOUS SOURCE)
 - WITHOUT TIMELY TREATMENT, SEPSIS CAN RAPIDLY LEAD TO TISSUE DAMAGE, ORGAN FAILURE, AND DEATH.

WHAT IS SEPSIS?

Sepsis is the body's overwhelming and life-threatening response to infection which can lead to tissue damage, organ failure, and death.

270,000 **8,000,000**

DEATHS IN UNITED STATES

DEATHS ACROSS THE GLOBE

EACH YEAR, MORE THAN 270,000 PEOPLE IN THE U.S. DIE FROM SEPSIS. WORLDWIDE, THAT FIGURE IS 8 MILLION.

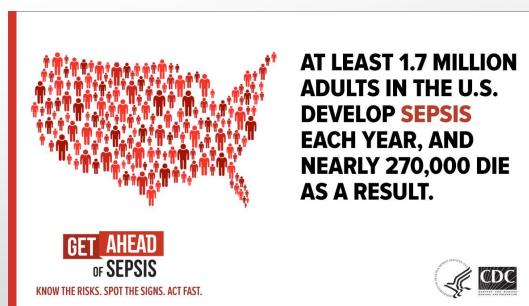


65%

OF AMERICANS SAY THEY KNOW THE WORD

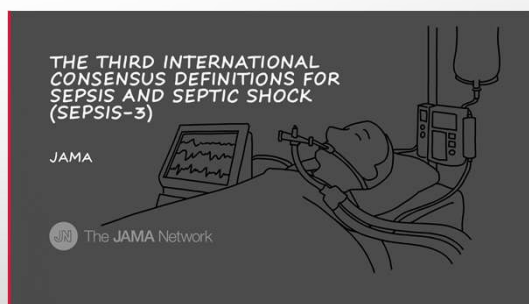
SEPSIS EPIDEMIOLOGY

- SEPSIS
 - 1.7 MILLION CASES PER YEAR IN THE US
 - 270,000 DEATHS PER YEAR
 - PUBLIC HEALTH ISSUE
 - COMPARED TO THE TOP 3 DISEASE DEATHS IN THE US IN 2020
 - CARDIAC - 696,962
 - CANCER - 602,350
 - COVID 19 - 350,831

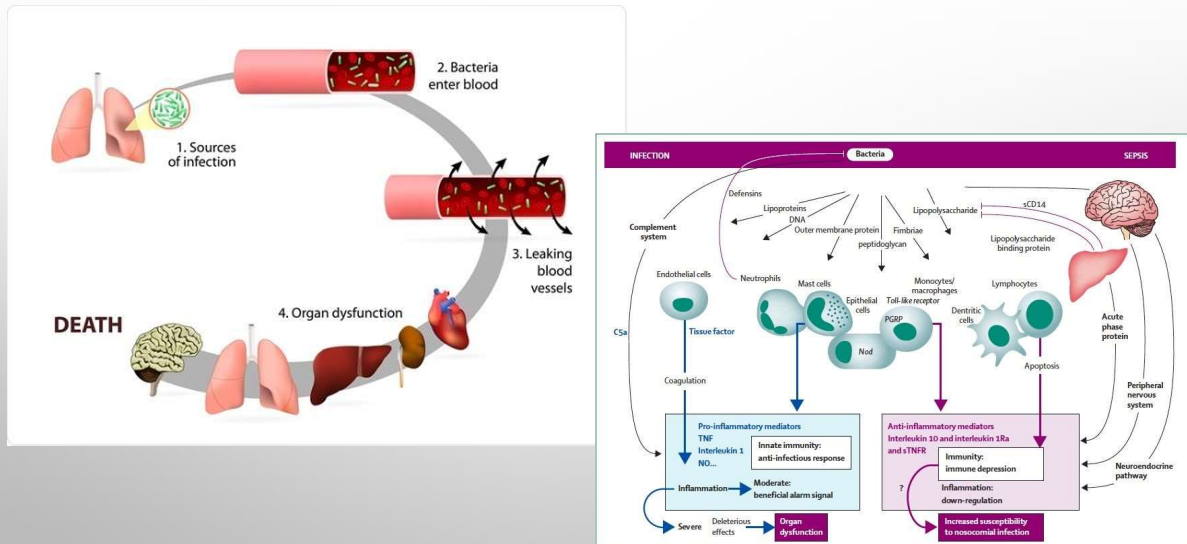


HISTORY OF THIS TERM CALLED SEPSIS

- 1991 – SEPSIS-1
 - A PATIENT'S SYSTEMIC INFLAMMATORY RESPONSE SYNDROME (SIRS CRITERIA)
- 2001 - SEPSIS-2
 - SEPSIS (DEFINED AS A PROVEN OR SUSPECTED INFECTION IN COMBINATION WITH AT LEAST 2 SYSTEMIC INFLAMMATORY RESPONSE SYNDROME (SIRS) CRITERIA) AND PERSISTENT HYPOTENSION (DEFINED AS A MEAN ARTERIAL PRESSURE BELOW 60 MM HG, A SYSTOLIC BLOOD PRESSURE BELOW 90 MM HG OR A DECREASE IN SYSTOLIC BLOOD PRESSURE OF AT LEAST 40 MM HG) DESPITE ADEQUATE FLUID RESUSCITATION
- 2016 – SEPSIS-3
 - SEPSIS IS DEFINED AS LIFE-THREATENING ORGAN DYSFUNCTION CAUSED BY A DYSREGULATED HOST RESPONSE TO INFECTION. SOFA AND QSOFA



SEPSIS IN THE BODY



OUR APPROACH



CC Sepsis / Septic Shock



History:

- Age (common in elderly and very young)
- Presence and duration of fever
- Previously documented infection or illness (UTI, pneumonia, meningitis, encephalitis, cellulitis, abscess, etc.)
- Recent surgery or invasive procedure
- Immunocompromised (transplant, HIV, diabetes, cancer)
- Bedridden or immobile patients
- Prosthetic or indwelling devices
- Immunization Status

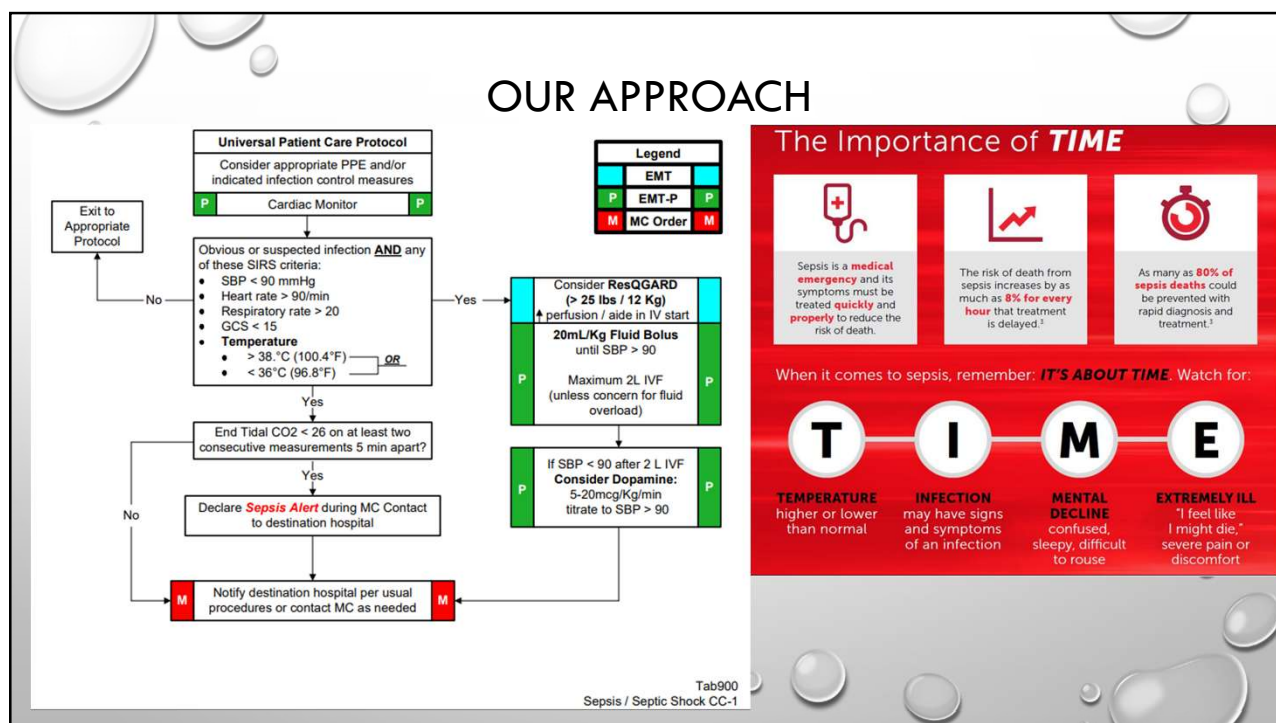
Signs / Symptoms:

- Hyper- or hypothermia
- Rash and/or excessive bruising
- Chills
- Myalgia (muscle aches)
- Markedly decreased urine output
- Altered mentation
- Delayed capillary refill
- Elevated blood glucose (unless diabetic)

Differential:

- Cardiogenic shock
- Hypovolemic shock
- Dehydration
- Hyperthyroidism
- Medication / drug interaction
- Non-septic infection
- Allergic reaction / anaphylaxis
- Toxicological emergency

OUR APPROACH



SPECIAL CONSIDERATIONS

- **EARLY RECOGNITION OF SEPSIS ALLOWS FOR THE ATTENTIVE CARE**
 - IV FLUIDS – ADULTS – MAX 2 LITERS UNLESS SIGNS OF CHF OR ESRD DEVELOP
- **ETCO2**
 - LOW LEVELS OF <26 "TRENDED" CORRESPOND WITH ELEVATED SERUM LACTATE LEVELS
 - MAY HELP CONFIRM INADEQUATE ORGAN AND TISSUE PERFUSION LEADING TO HYPOXIA AND METABOLIC ACIDOSIS
- **DIC (DISSEMINATED INTRAVASCULAR COAGULATION) – LATE SIGN**
 - SEVERE DYSPNEA ASSOCIATED WITH EXTENSIVE BRUISING

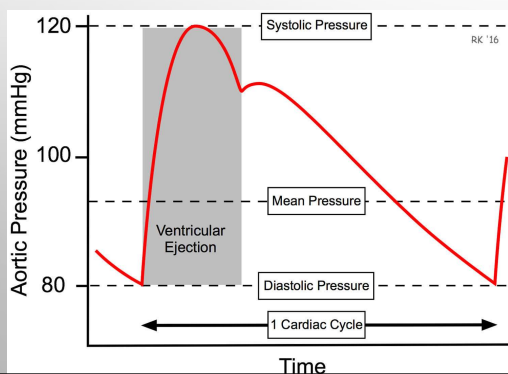
“ITS SO EASY, EVEN A LIFE PACK COULD DO IT”

- TRENDING VITAL SIGNS
 - THE USE OF MORE THAN ONE SET OF VITAL SIGNS TO DETECT CHANGES OR “TRENDS” IN PATIENT CONDITIONS



THE MAP THE MAP THE MAP...

- MEAN ARTERIAL PRESSURE
 - THE MEASUREMENT THAT EXPLAINS THE AVERAGE BLOOD PRESSURE IN A PERSON'S BLOOD VESSELS DURING A SINGLE CARDIAC CYCLE
- VITAL TO HAVE A MAP OF AT LEAST 65 MMHG TO PROVIDE ENOUGH BLOOD TO THE CORONARY ARTERIES, KIDNEYS, AND BRAIN
- THE NORMAL MAP RANGE IS BETWEEN 70 AND 100 MMHG
- MEAN ARTERIAL PRESSURES THAT DEVIATE FROM THIS RANGE FOR PROLONGED PERIODS OF TIME CAN HAVE DRASTIC NEGATIVE EFFECTS ON THE BODY
 - SEPSIS???



$$MAP = \frac{2 * DBP + SBP}{3}$$

DECLARE THE SEPSIS ALERT



CC
Sepsis / Septic Shock



Special Considerations for Sepsis (cont.):

Sepsis Alert

The purpose of a Sepsis Alert is to provide pre-arrival Emergency Department notification in order to facilitate rapid assessment and treatment of a suspected severe sepsis patient. Sepsis Alert patients should be transported to a hospital with on-site intensive care service (NOT a free standing Emergency Department).

A **Sepsis Alert** will be declared for patients meeting the following 3 criteria:

1. Suspected infection
2. Two or more of the following:
 - Temperature $> 38^{\circ}\text{C}$ (100.4°F) OR $< 36^{\circ}\text{C}$ (96.8°F)
 - Respiratory rate > 20 breaths/min
 - Heart rate > 90 beats/min
3. $\text{ETCO}_2 < 26$ mm Hg OR Lactate > 4 mMol

Advanced Life Support:

- Full ALS assessment and treatment
- Notify hospital of incoming **Sepsis Alert** prior to arrival
- Consider ResQCARD (ITD) to increase perfusion / aide in IV start
- Administer 20mL/kg fluid bolus until SBP > 90 mmHg
- Total amount of IVF should not exceed 2 Liters
- If SBP remains < 90 mm Hg following fluid administration: Dopamine infusion at 5-20 mcg/kg/min titrated to maintain SBP > 90 mmHg

ESO FORMS TAB SEPSIS ALERT

PREREQUISITES

Sepsis Screening UTO OK

Do NOT screen patients that are pregnant or under the age of 18.

Time Performed: 15:41:32 Date: 02/14/2022

Prerequisites

Infection Suspected or Documented Yes No

$\text{EtCO}_2 \neq 20$ mmHg Yes No

Lactate Level $\neq 4$ mmol/L Yes No

Prerequisites Met Yes

Quick Sepsis Organ Failure Assessment (qSOFA)

Systolic Blood Pressure $\neq 100$ mmHg Yes No

Respiratory Rate $\neq 22$ breaths/min Yes No

Glasgow Coma Scale ≤ 13 Yes No

Criteria Met Yes

PREREQUISITES

Sepsis Screening UTO OK

SIRS

Systemic Inflammatory Response Syndrome (SIRS)

Temperature $\leq 96.8^{\circ}\text{F}$ (38°C) or $\geq 100.4^{\circ}\text{F}$ (38°C) Yes No

Heart Rate ≥ 90 bpm Yes No

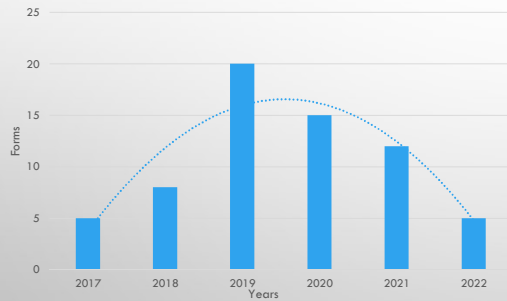
Respiratory Rate ≥ 20 breaths/min Yes No

White Blood Cell Count $\leq 4,000$ or $\geq 12,000$ cells/mm³ Yes No

Criteria Met Yes

ESO DATA TRENDS

Sepsis Reporting



- SEPSIS FORMS
- QSOFA
- SIRS

CASE STUDY

Lucas County Emergency Medical Service
Patient Care Record

Patient 1 of 2

Patient Information		Clinical Impression	
Last	Address	Primary Impression	Sepsis, Septicemia
First	Address 2	Secondary Impression	
Middle	City	Protocol Used	Hyperglycemia
Gender	State	Anatomic Position	General, Global
DOB	Zip	Onset Time	
Age	Country	Last Known Well	
Weight	Tal	Chief Complaint	altered level of consciousness
Ped Color	Physician	Duration	2
SSN	Ethnicity	Secondary Complaint	
Race		Duration	
Advance Directives		Patient's Level of Distress	
Resident Status	RESIDENT WITHIN EMS SERVICE AREA	Signs & Symptoms	Metabolic, Hyperglycemia Behavior/Emotional State - Slowness and poor responsiveness Metabolic - Sepsis
Patient Resides in Service Area		Injury	
Temporary Residence Type		Additional Injury	
		Mechanism of Injury	Medical
		Barriers of Care	Psychologically Impaired
		Alcohol/Drugs	Unknown
		Pregnancy	No
		Initial Patient Acuity	Emergent (Yellow)
		Final Patient Acuity	Emergent (Yellow)
		Patient Activity	

Medications: Amiodarone, Aspirin, Cymbalta, Fluoxetine, Hydrocodone, Levorphanol, Metoprolol, Miralax, Vitamin B12

Allergies: No known allergies

History: Anemia, Atrial Fibrillation, Bipolar II Disorder, Cardiac Arrhythmia, Gastro-Esophageal Reflux Disease (GERD), Hyperlipidemia, Hypertension (HTN), Hypotension, Kidney/renal Failure, Urinary Tract Infection (UTI)

Immunizations: Last Oral Intake

Time	AP/PU	Side	POS	BP	Pulse	RR	SPO2	ETCO2	CO	BG	Temp	Pain	GCS(E+V+M)	Qualifiers	RTS	PTS
PTA	Voice			93/55 A	100 II		100			600	102.7 F/101E			8/12-5		
09:23					115	28	97	15								
09:24					92	24	97	17								
09:25				107/57 A	92	24	98	15								
09:31				109	29											
09:31	Voice															

Time	Treatment	Description	Provider
PTA	IV Bolus	10 giv. Anterior/Posterior Left Normal Saline (0.9% NaCl); Total Fluid: 300 mL; Patient Response: Improved; Successful; Complication: None; Medical Control: Protocol (Standing Order); Treatment By: First Responder; Agency: Springfield Twp FD.	
PTA	Oxygen	Device: CO2 Nasal Cannula; Flow Rate: 4 lpm; Patient Response: Unchanged; Successful; Complication: None; Medical Control: Protocol (Standing Order); Treatment By: First Responder; Agency: Springfield Twp FD.	
09:35	Contact Report Only	Comments: Radio report to UTMIC; Patient Response: Unchanged; Complication: None; Medical Control: Protocol (Standing Order);	
09:39	12-Lead ECG	Patient Response: Unchanged; Successful; Complication: None; Medical Control: Protocol (Standing Order);	
09:31	12-Lead ECG	Patient Response: Unchanged; Successful; Complication: None; Medical Control: Protocol (Standing Order);	

Assessment Time: 09:31

Category	Comments	Subcategory
Mental Status		Mental Status

Lucas County Emergency Medical Service
Patient Care Record

Patient 1 of 1

Assessment		Subcategory	
Category	Comments	Subcategory	
SKIN		Skin	✓ Dry - Hot
		✓ Clammy - Cold	
HEENT		Head	Not Assessed
		Face	Not Assessed
		Eyes	✓ Left 3-mm - Reactive Right 3-mm - Reactive
		✓ Left Clouded - Deformity - Non-Reactive Right Deformity - Non-Reactive	
Chest		Neck	Not Assessed
		Chest	Not Assessed
		Heart Sounds	Not Assessed
		Lung Sounds	Not Assessed
Abdomen		General	Not Assessed
Back		Back	Not Assessed
Pelvis/GU/GI		Pelvis/GU/GI	Not Assessed
Extremities		Left Arm	Not Assessed
		Right Arm	Not Assessed
		Left Leg	Not Assessed
		Right Leg	Not Assessed
Neurological		Neurological	✓ Aphasia - Weakness - Left Sided - Weakness - Right Sided

Narrative

was dispatched to nursing home at above address for an unconscious patient. Upon arrival, as already on scene assessing and treating the patient. Due to patient's room being in the second floor, there was a delay in patient contact from on scene time. Nursing home staff stated patient was in and out of the hospital due to similar issues last couple months. Per nursing home staff, patient normal mentation is grunting without any comprehensible words verbally but more active than current status. Patient was not responsive to IV access attempt by first responders. Patient was responsive to loud-verbal stimuli with grunts. Patient eyes were at 3mm, equal, and reactive to light. Patient was warm to the touch with temp of 102.7F with IR. Nursing home stated they checked the patient's blood glucose 2 hours prior to EMS arrival and noted as "high". First responders noted the blood glucose to be 600. Patient was on Oxygen by nursing home normally and was maintained with ETCO2 nasal cannula. Nursing home suggested patient might have started declining status since last night. No actual unconsciousness was noted by first responders. Patient's paperwork started full code status. Radio report was given to UTMIC with a sepsis notification. UTMIC did not give any further orders nor questions. Patient was moved to the cot and secured with three point straps and moved to the ambulance without incident. No significant changes were noted during transport. Patient was atrial fibrillation on the 12 lead and non-diagnostic for STEMI. Upon arrival to UTMIC, patient was moved to the hospital bed by EMS staff and hospital staff. Verbal report was given to physician and nursing staff. Patient care transferred.

Time Performed	Specifically Patient - Sepsis Screening	SIRS Criteria Met
	qSOFA Criteria Met	Yes
Infection Suspected or Documented	Yes	Glasgow Coma Scale < 15
ECG/CO2 > 25 mmHg	Yes	Temperature < 96.8 F (36 C) or > 100.4F (38 C)
Lactate Level > 4 mmol/L	Yes	Heart Rate > 90 bpm
Systolic Blood Pressure < 100 mmHg	Yes	Respiratory Rate > 20 breaths/min
Respiratory Rate > 22 breaths/min	Yes	White Blood Cell Count < 4,000 or > 12,000 cells/mm3

PEDIATRICS

- FREQUENT REASONS FOR INFECTION

- EARS
- INFECTED WOUND
- STREP
- CONJUNCTIVITIS
- RSV
- ETC

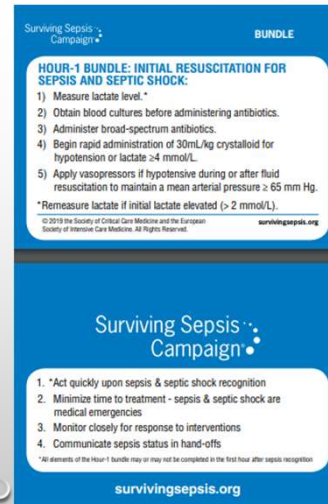
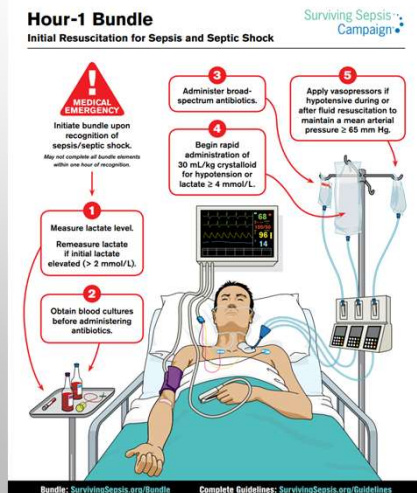
- IV FLUIDS

- 20ML / KG BOLUS
- SBP $>70 + 2 \times \text{AGE}$
 - MAX OF 2 LITERS
 - HANDTEVY

EMS MOVEMENT

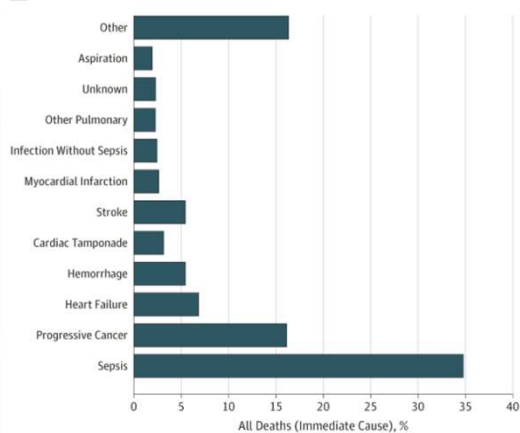


REMEMBER THE CONVERSATION ABOUT TIME?

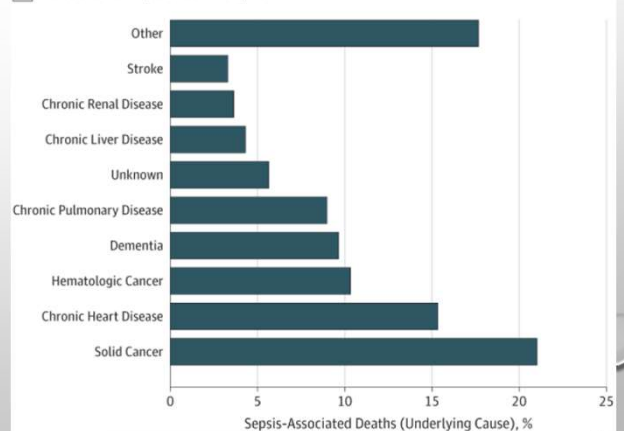


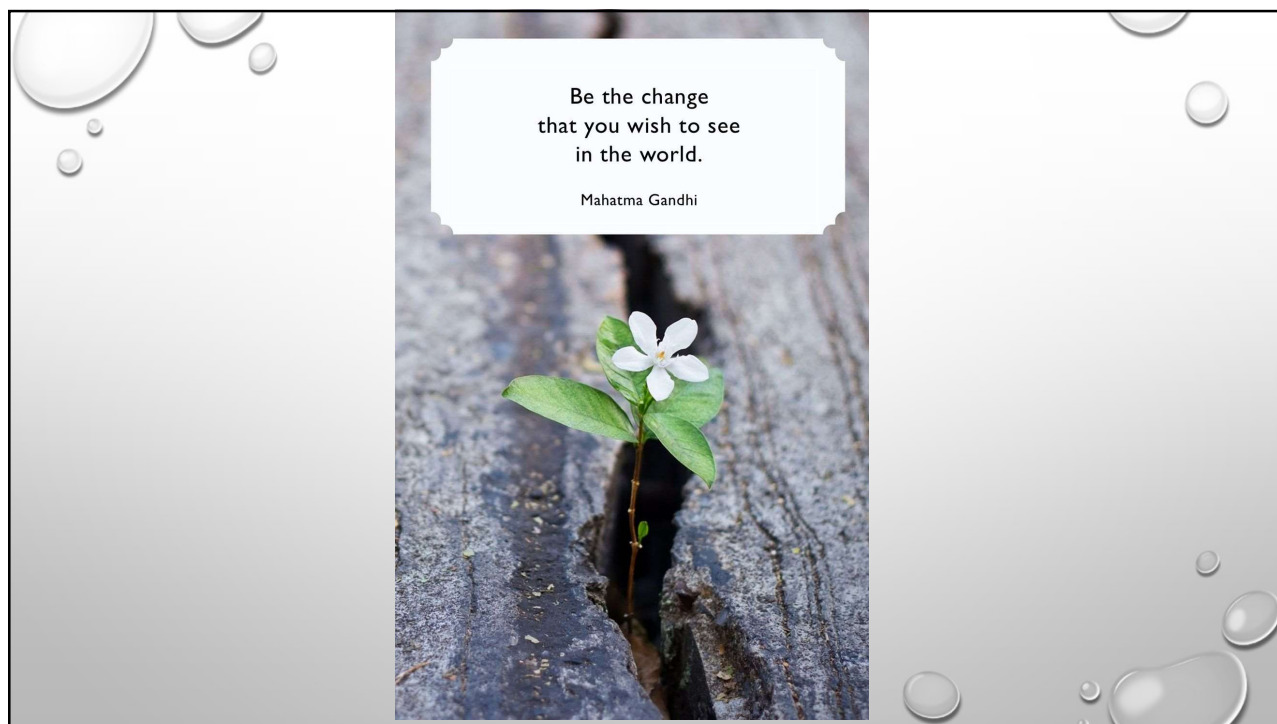
MUCH WORK TO DO!

A Immediate cause of death in all patients



B Cause of death in patients with sepsis





REFERENCES

- SOCIETY FOR CRITICAL CARE MEDICINE
 - SURVIVING SEPSIS CAMPAIGN
- SEPSIS ALLIANCE

