



Maryland Chapter

AMERICAN COLLEGE OF EMERGENCY PHYSICIANS

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FACULTY: [Maria 'Marysia' Lawrynowicz, M.S., MD](#)

PRESENTATION

Alcoholics Anonymous

DESCRIPTION

Recognizing alcoholic ketoacidosis as the etiology of your patient's symptoms is difficult as the presentation is varied and lab interpretation is nuanced. This presentation will provide several salient points to help you understand the relevant pathophysiology as it relates to diagnosis and treatment of the disease.

OBJECTIVES

- Describe the pathophysiology of alcoholic ketoacidosis as it relates to diagnosis and treatment.
- Identify the constellation of lab values that may be seen in alcoholic ketoacidosis.
- Brief case presentation.
- Pathophysiology of AKA.
- Diagnostic results.
- Treatment.

DISCLOSURE

No significant financial relationships to disclose.

Alcoholics Anonymous

MARYSIA (MARIA)
LAWRYNOWICZ, PGY2

MGUH/MWHC

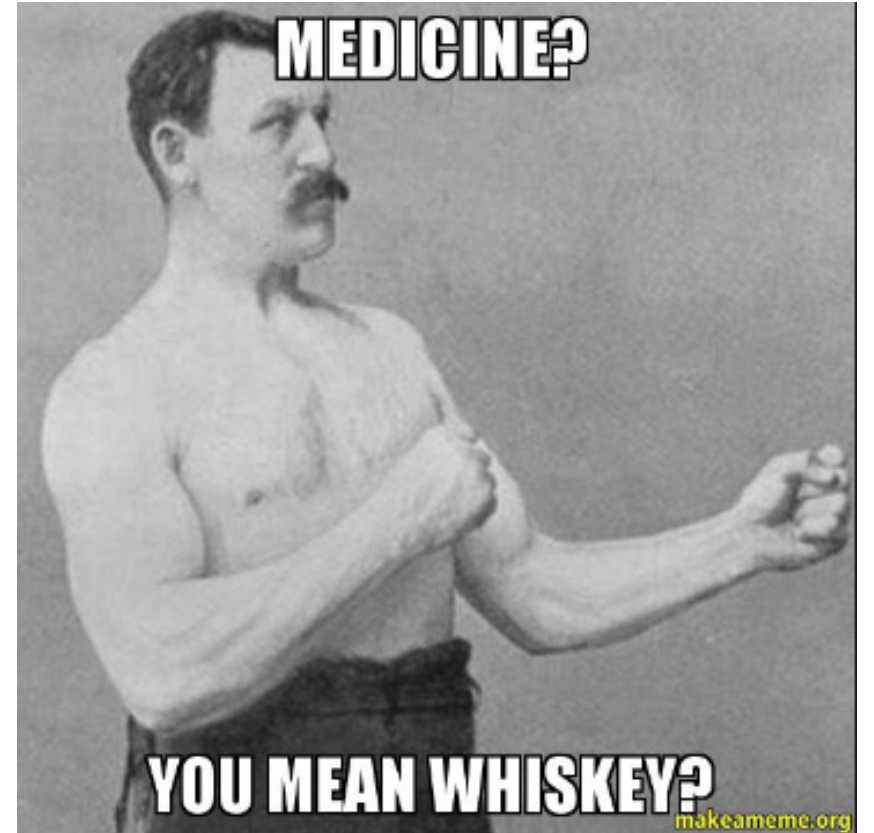


HPI

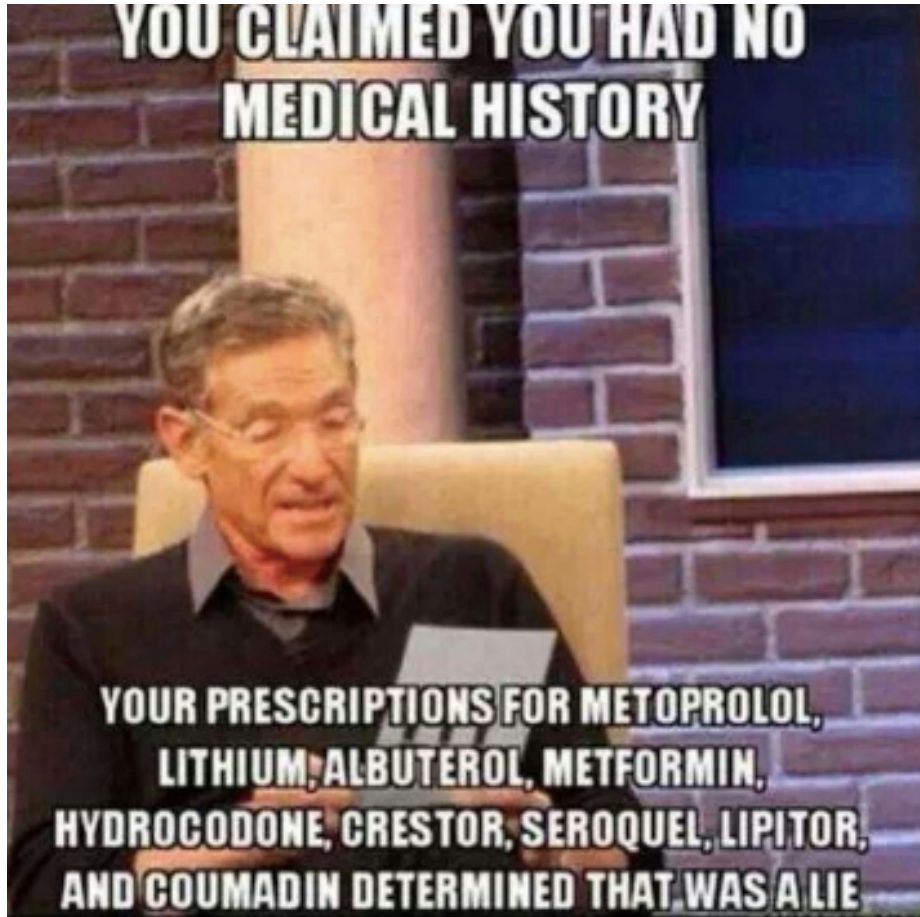
53yoF p/w CP and LBP.

She has not been taking her meds or eating due to the pain, but has been drinking alcohol.

She was found down **hypoxic** and **tachycardic** with AMS.



HPI cont.



PMHx: NONE per patient

BUT, per paperwork....

COPD, atrial fibrillation, atrial flutter, GERD, obesity s/p gastric bypass with revision, spinal stenosis s/p L4 laminectomy and L4-5 discectomy, anxiety, depression

PE

VS T: 36C (Oral) HR: 109 RR: 18 BP: 149/69 SpO2: 90%

General: Chronically ill appearing. **Shifting in bed.**

HEENT: **Edentulous.** Dry MM.

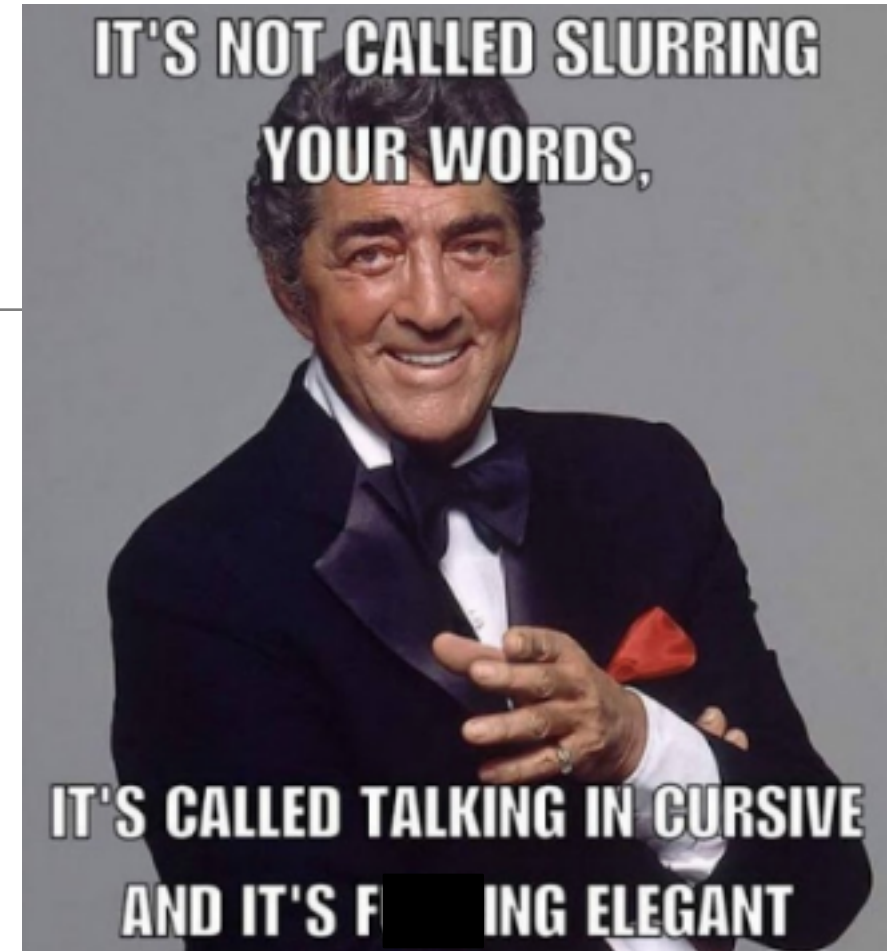
Resp: **Tachypneic.** CTA.

CV: **Tachycardic.**

Abdomen: Soft, **+diffuse TTP.** BS+

Neuro: Difficult to understand speech. **No FND.**

Skin: **Cool and clammy.**



Lab called... 'no no it's L-A-W-R-Y...'

pH 7.14



pCO2 18



HCO2 8



Expected feedback on presentation after bringing up acid-base disorders

Anion gap metabolic acidosis

Lab View	07/04/2018 13:18 EDT
<input type="checkbox"/> pH Art	7.14 * CRITICAL \\\
<input type="checkbox"/> pCO2 Art	18.0 * CRITICAL \\\
<input type="checkbox"/> pO2 Art	53.0 L
<input type="checkbox"/> HCO3 Art	6.1 L
<input type="checkbox"/> Base Ex/Def Art	-20.9 L


$$\text{ANION GAP: Na} - (\text{Cl} + \text{CO}_2) = 133 - (94 + 8)$$

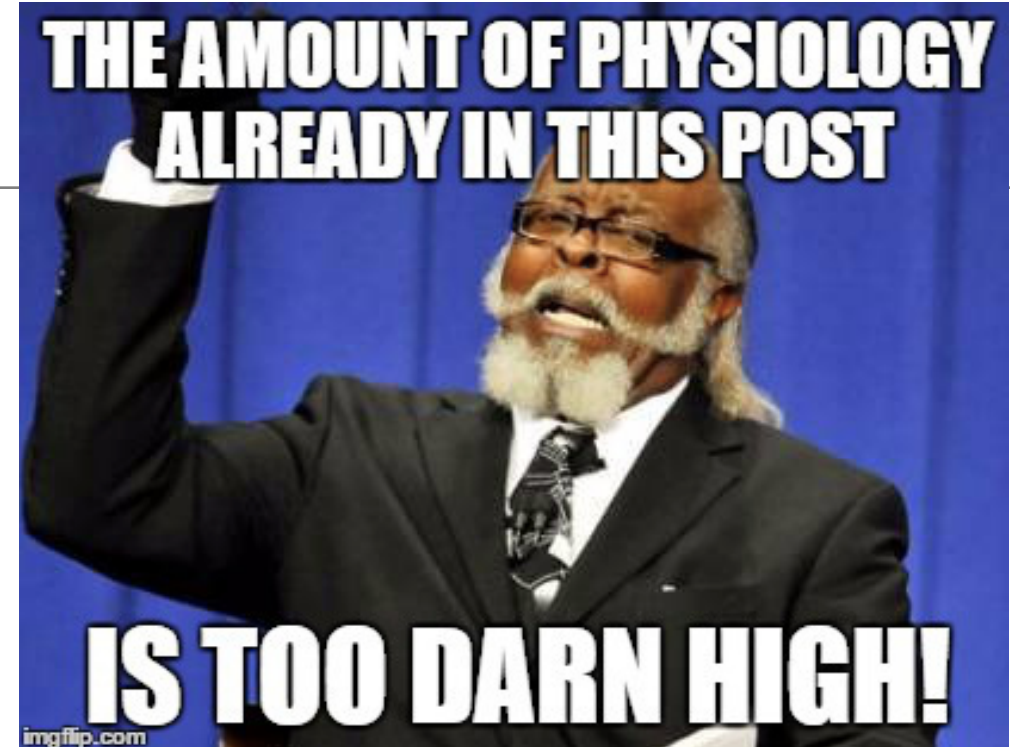


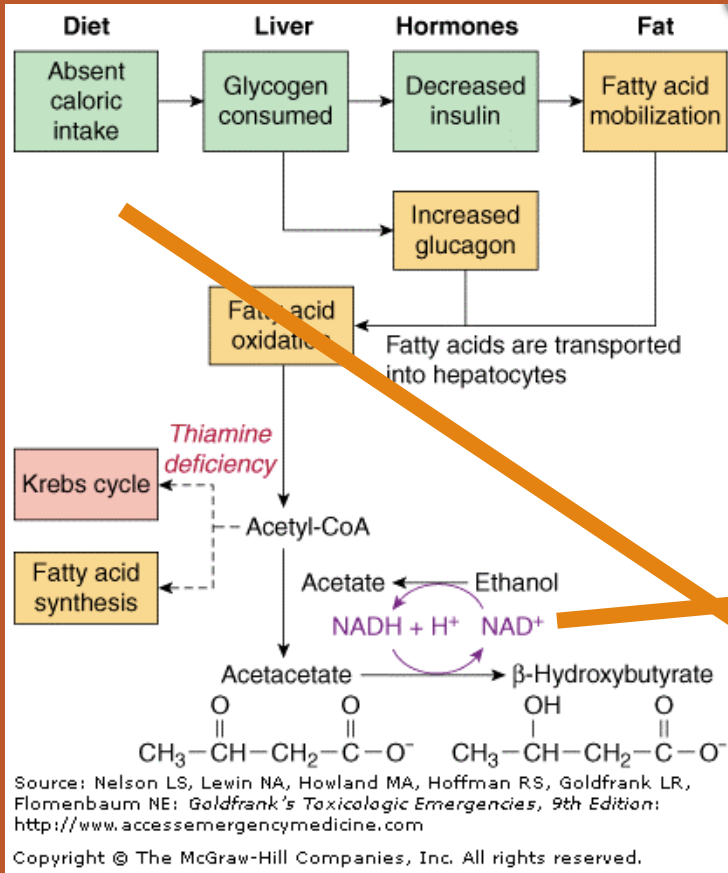
Alcoholic ketoacidosis

AKA THE OTHER KETOACIDOSIS

Roadmap

- Case presentation 
- **Pathophysiology**
- Presentation
- Diagnostic results
- Treatment
- Conclusion





1. Ketotic state

2. Increased NADH

3. Adrenergic state

Pathophysiology
of AKA

1. Ketotic state \longleftrightarrow 3. Adrenergic state

STARVATION



LIPOLYSIS

--- Acetyl-CoA



KETONES



2. Increased NADH

Roadmap

- Case presentation ✓
- Pathophysiology ✓
- **Presentation**
- Diagnostic results
- Treatment
- Conclusion

When you and your bff are recovering after a night of drinking..



Presentation

HPI:

- PMHx of ETOH use
- Recent cessation of binge drinking
- +/- Gastritis
- +/- Pancreatitis
- +/- Aspiration pneumonia

Symptoms:

- Nausea/ vomiting
- Abdominal pain
- Dehydration

DDx

- Toxic alcohol ingestion
 - *Altered sensorium*
 - *Initial osmolar gap → anion gap*
- Diabetic ketoacidosis
 - *Altered sensorium*
 - *BG > 250 usually*
- Starvation ketosis
 - *Bicarbonate usually not as low*
- Lactic acidosis > 4

	DKA	AKA	Fasting
Bicarb	<10 possible	<10 possible	>18
Glucose	High	Low – mild high	Low – normal
Ketonuria	+	+/-	+

<https://www.emra.org/emresident/article/understanding-alcoholic-ketoacidosis/>

Roadmap

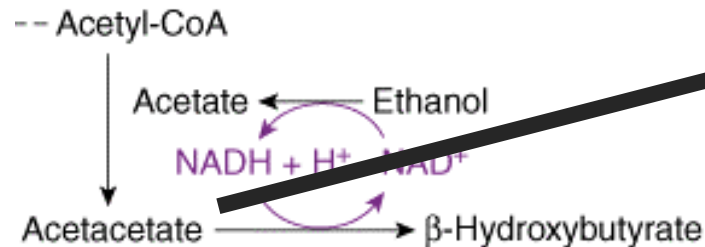
- Case presentation ✓
- Pathophysiology ✓
- Presentation ✓
- **Diagnostic results**
- Treatment
- Conclusion



Lab values

HYPER – glycemia, osmolarity

HYPO – ETOH, kalemia,
phosphatemia, magnesemia



Delta delta delta

AKA w/ ABG (n = 40)

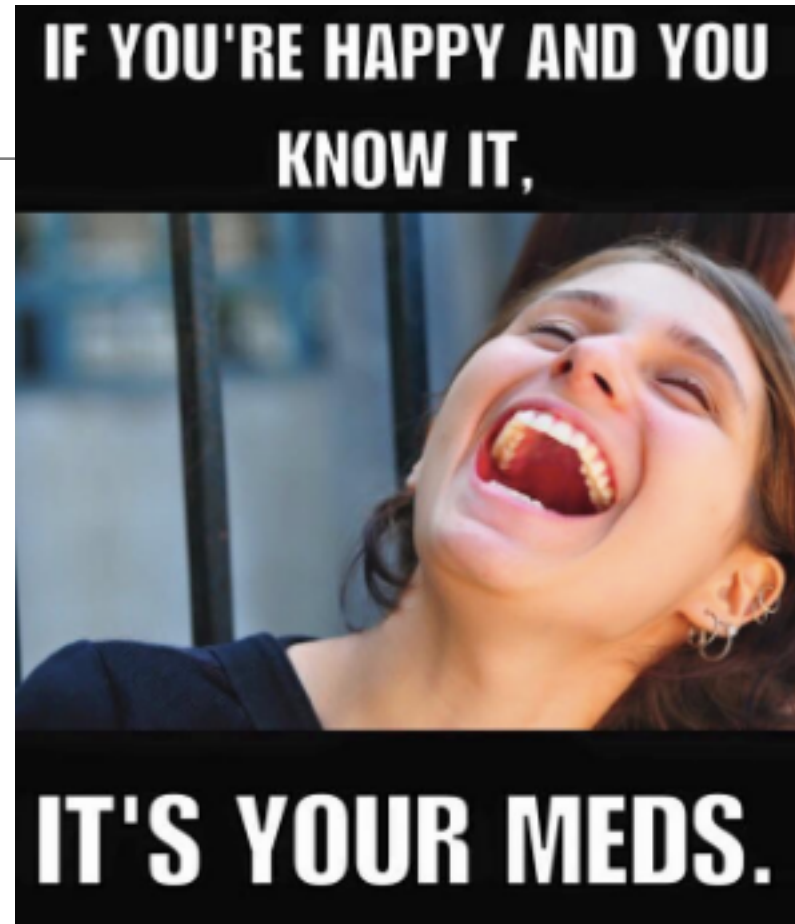
23% anion gap metabolic acidosis

... the rest was mixed



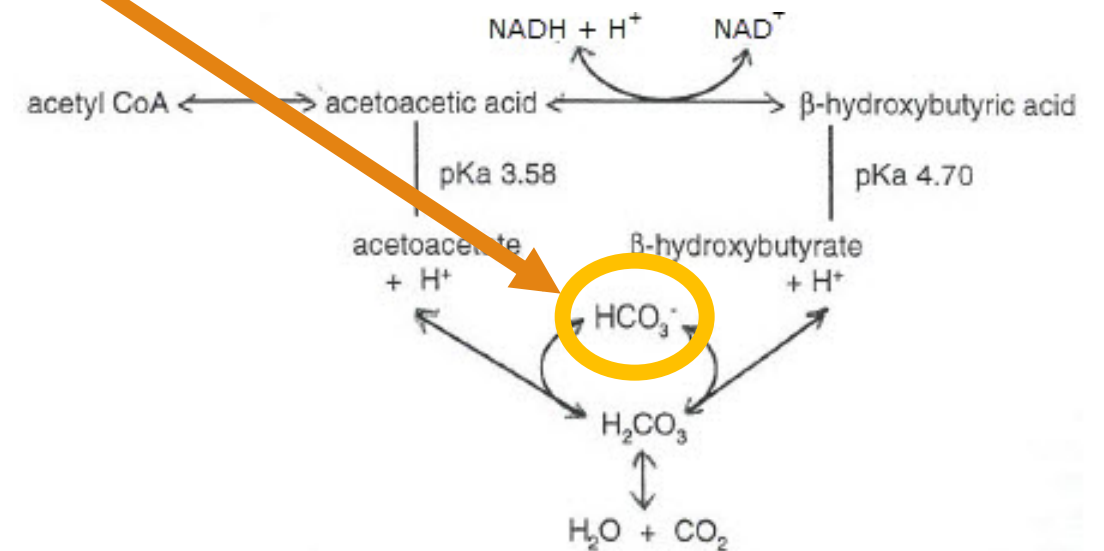
Roadmap

- Case presentation ✓
- Pathophysiology ✓
- Presentation ✓
- Diagnostic results ✓
- **Treatment**
- Conclusion



Treatment

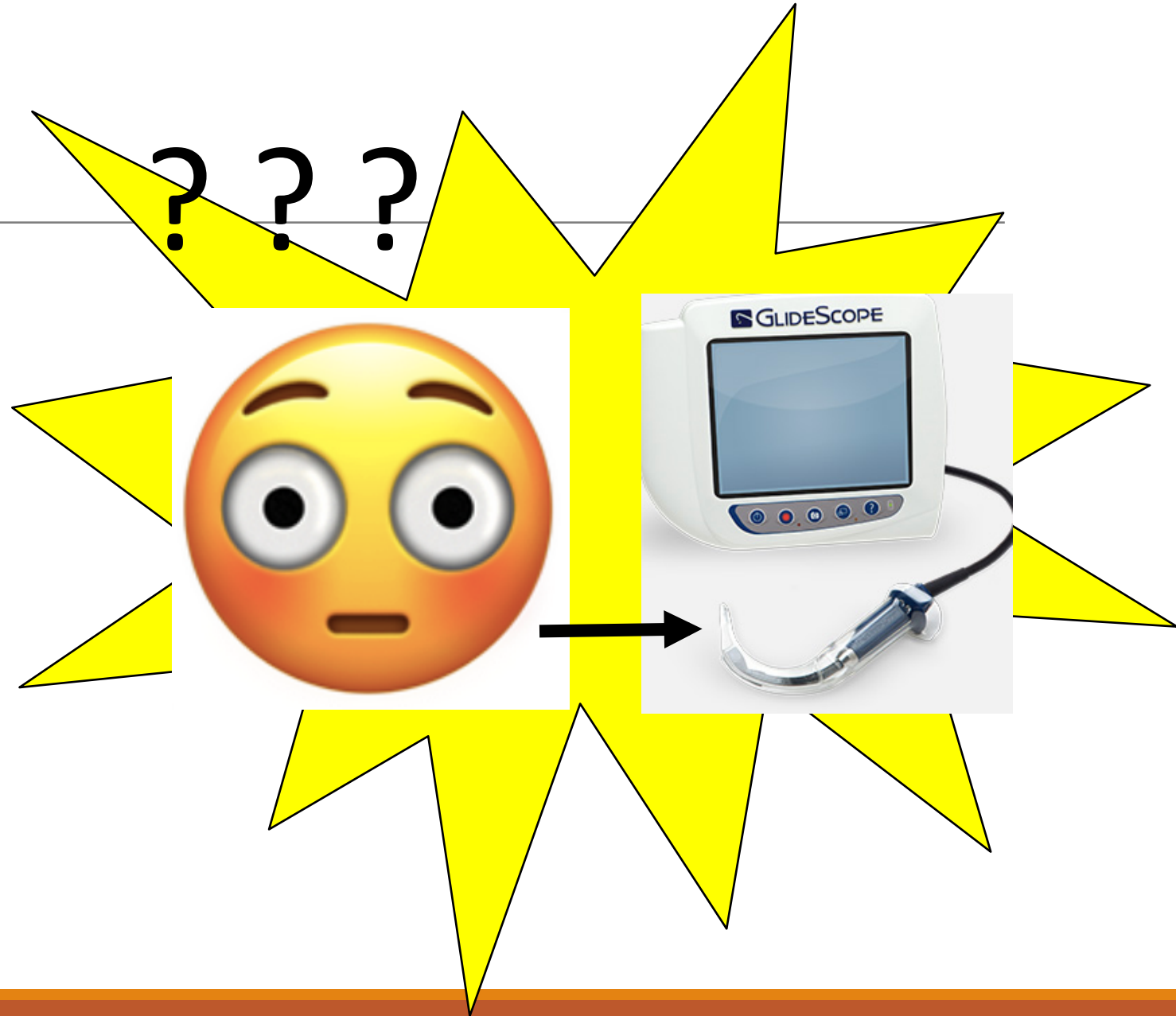
- 1. Isotonic AND dextrose containing fluids
- 2. Thiamine 100mg IV or IM
- 3. Replete all electrolytes
- 4. Treat alcohol withdrawal
- 5. Treat cause



Miller et al. Treatment of alcoholic acidosis: the role of dextrose and phosphorus. *Arch Int Med* 1978; 138:67-72.

Roadmap

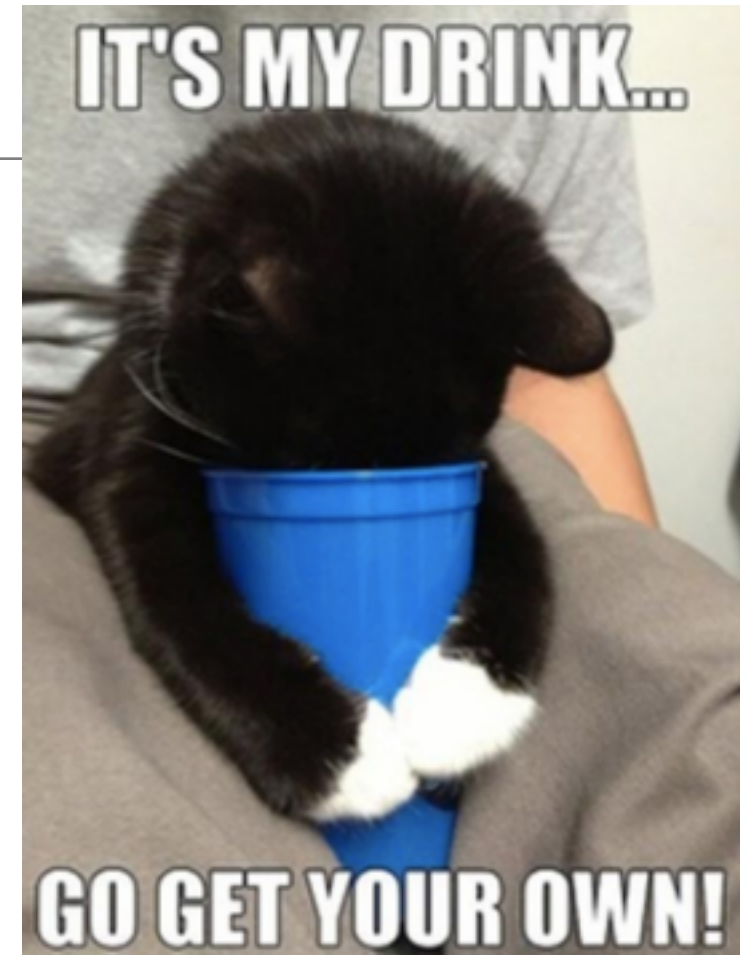
- Case presentation ✓
- Pathophysiology ✓
- Presentation ✓
- Differential Dx ✓
- Diagnostic results ✓
- Treatment ✓
- **Conclusion**



Pearls and pitfalls

- Recognizing this is half the battle
- Listen to the story
- Know the limitations of your lab studies
- Give volume with dextrose (and thiamine)!
- Be an internist... *replete the lytes*
- Treat precipitating factor

- Case reports do not have to be that interesting



References

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