


CIRSx
Leaders in Chronic Inflammatory Response Syndrome

Advancing the science to treat, educate, and serve those suffering from Chronic Inflammatory Response Syndrome (CIRS).

**ADH:
To Pee or Not to Pee,
That is the Question.**

Scott W. McMahon, MD
□Dream of GENIE:
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1

Disclaimer

This course is for educational purposes only. It is not intended to be used in any health, environmental, legal or financial situation to diagnose, treat, interpret, analyze or advise for yourself or others. Please seek out the appropriate professionals, as needed.

2

Disclosures

□am the owner of Whole World Health Care

□am an owner of CIRSx

□provide legal testimony for plaintiffs and defendants in mold-based litigation

3

Scott McMahon, MD

MD – Creighton, Residency – Duke University Medical Center

28+ Years General Pediatrics, 14+ Years CIRS Medicine

1st Shoemaker Certified Physician, ~2000 patients evaluated

Co-authored 12 peer-reviewed publications/Consensus statements

6+ Years medicolegal work

4

Objectives

ADH Introduction

What does ADH do?

Disorders Related to ADH

ADH and CRIS

Takeaways

5

ADH Introduction

ADH, aka arginine vasopressin

Made in the Hypothalamus

Supraoptic nucleus and Paraventricular nucleus

Transport to posterior Pituitary via the portal system

Transport in the axon itself

Stored in the posterior pituitary

6

ADH Introduction

Adjusts fluid balance (tonicity homeostasis)

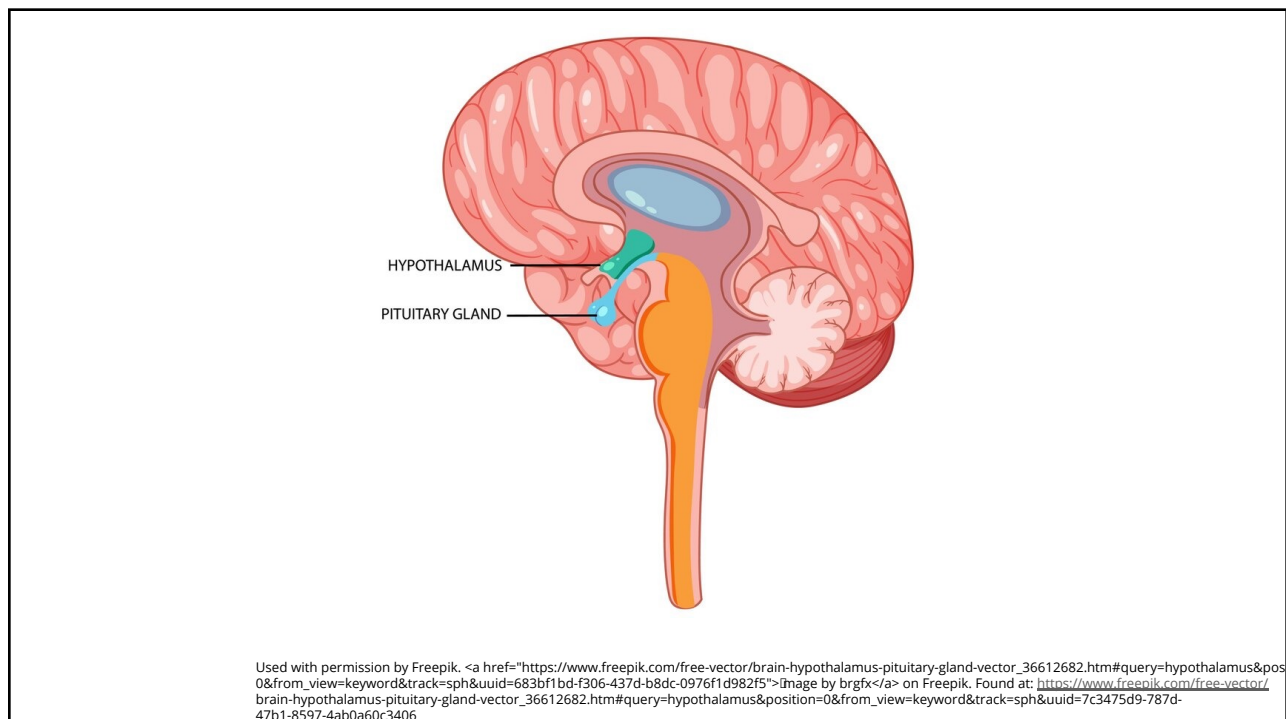
Modulates blood pressure – vasoconstricts arterioles

Sodium homeostasis

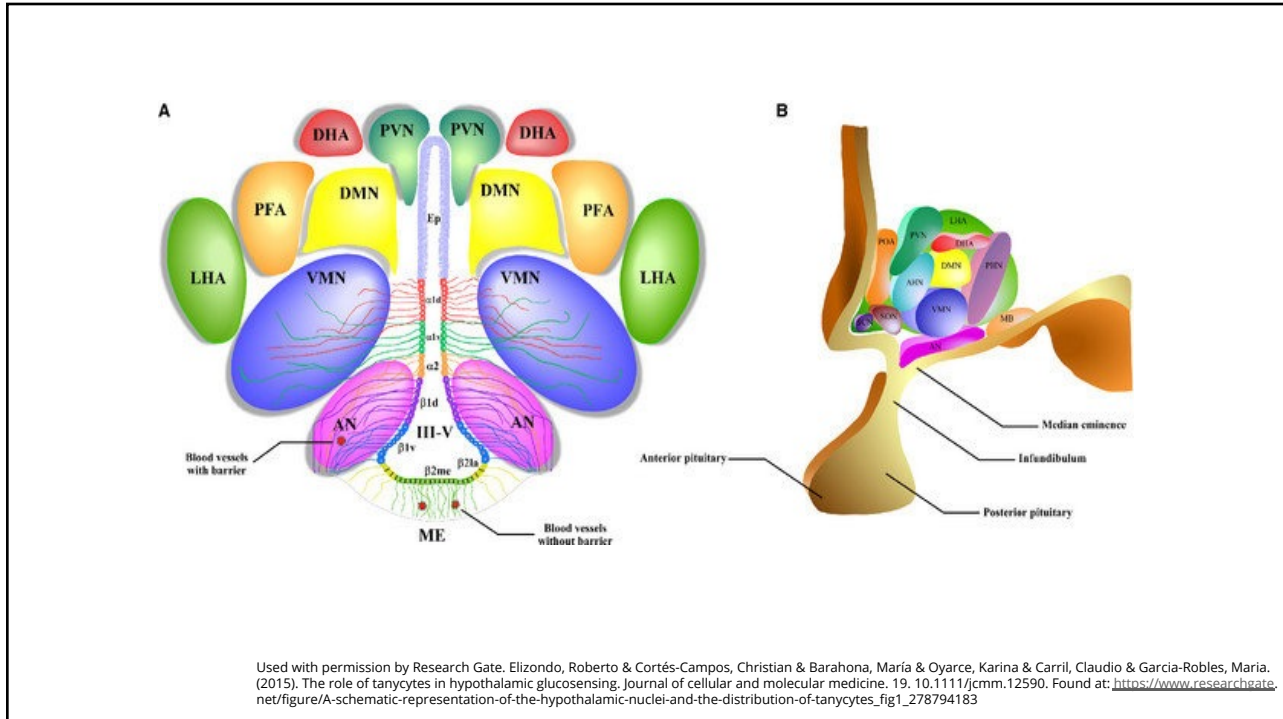
Hemostasis – activates V1a + extra-renal V2 receptors
Leads to release of coagulation factors

Regulates circadian rhythm - timekeeper, (↓ thirst)

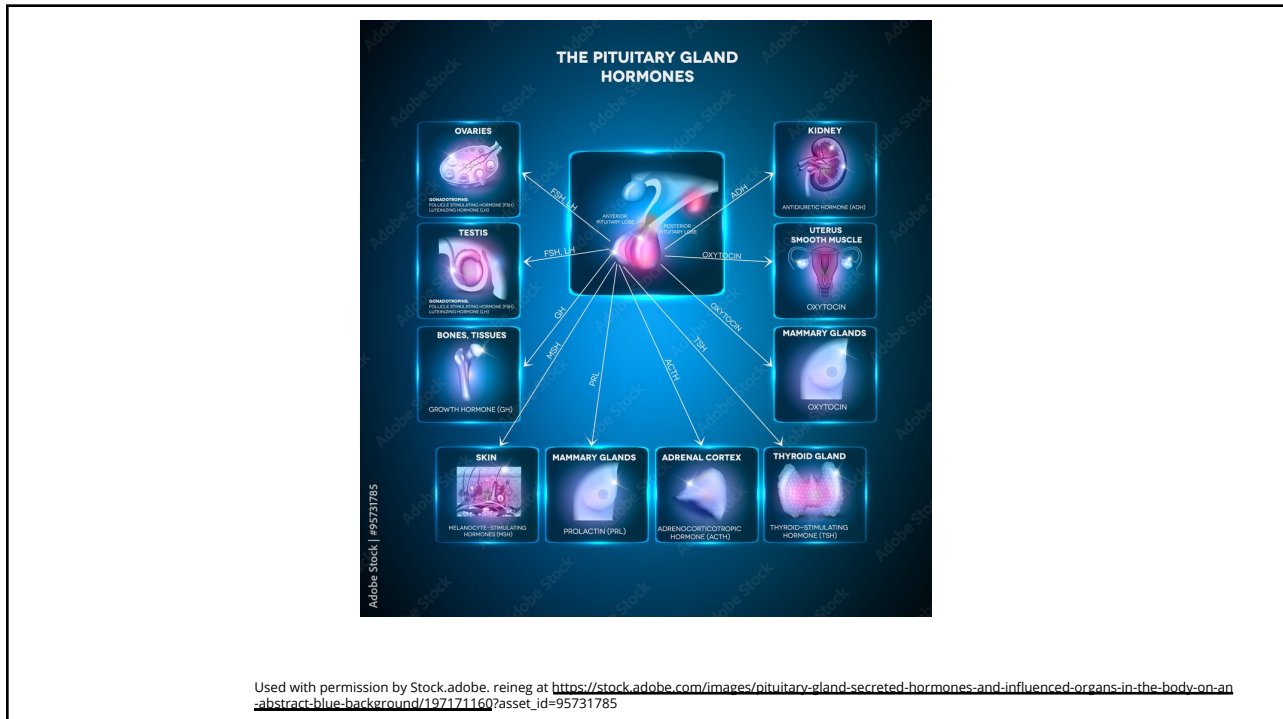
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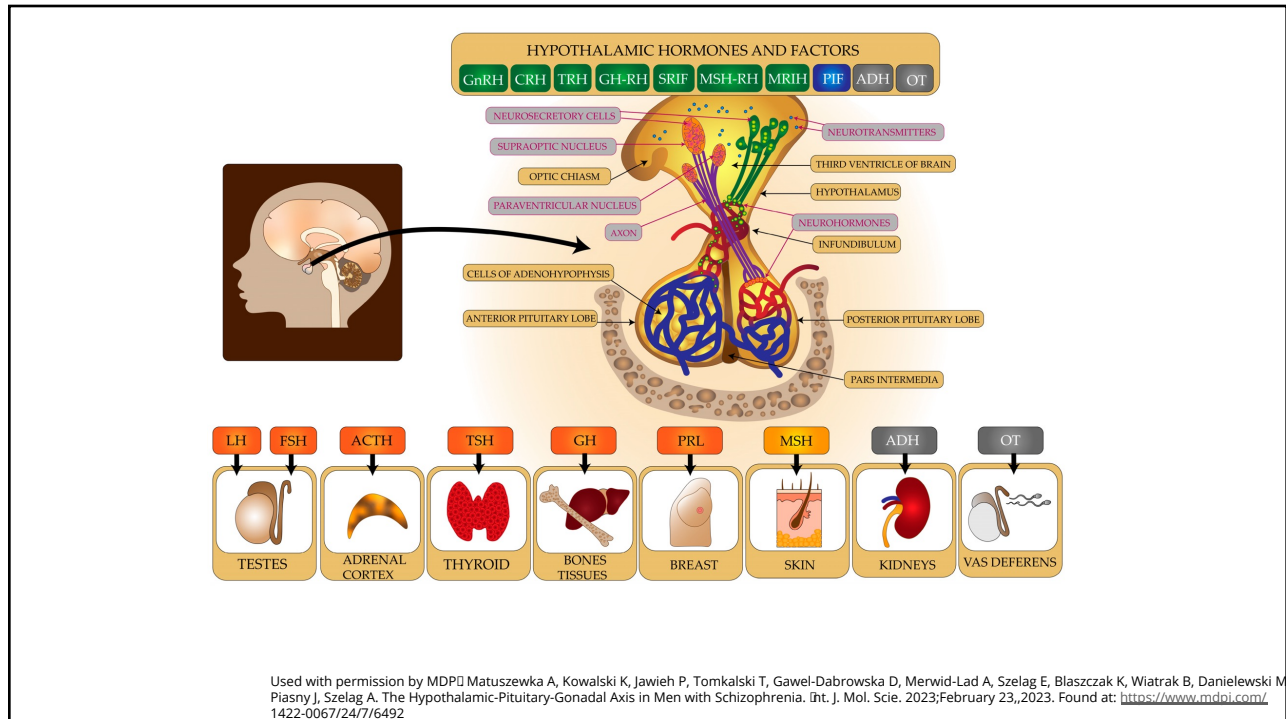
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9



10



11

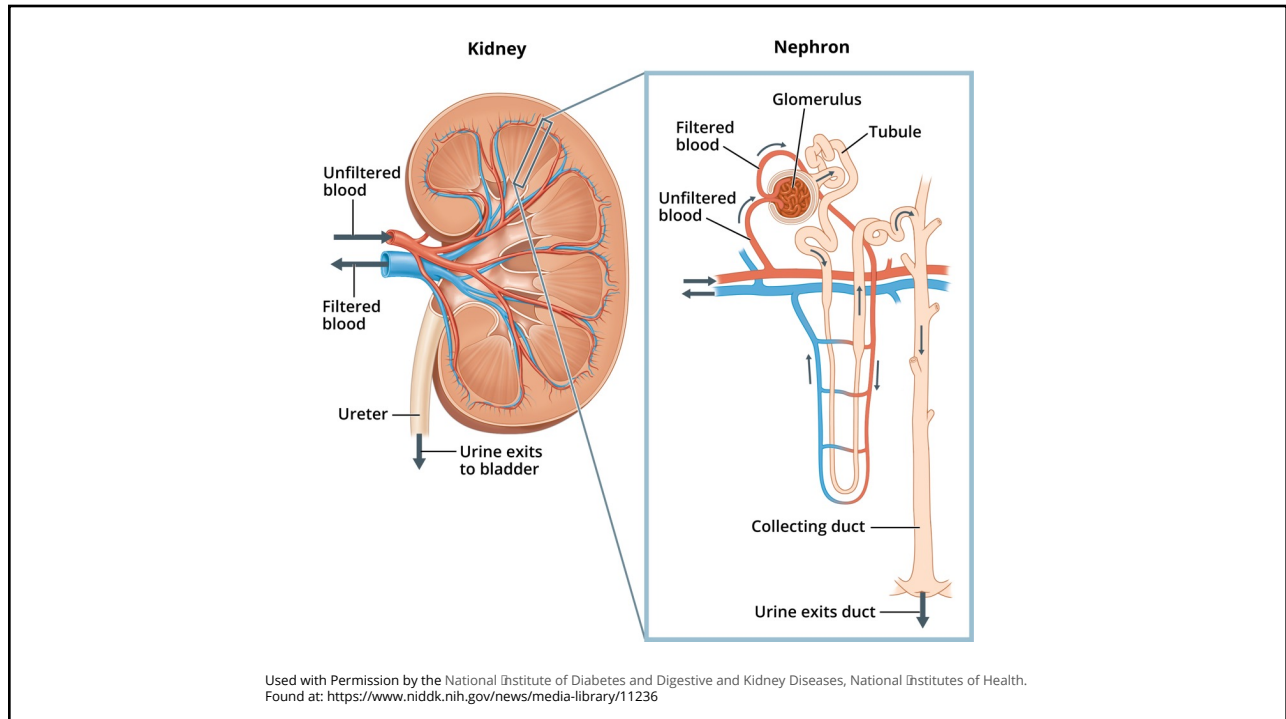
ADH Introduction

ADH works by increasing water reabsorption in the late distal tubule and collecting duct

The ultimate result is reabsorbing more free water, making less urine and increasing blood volume.

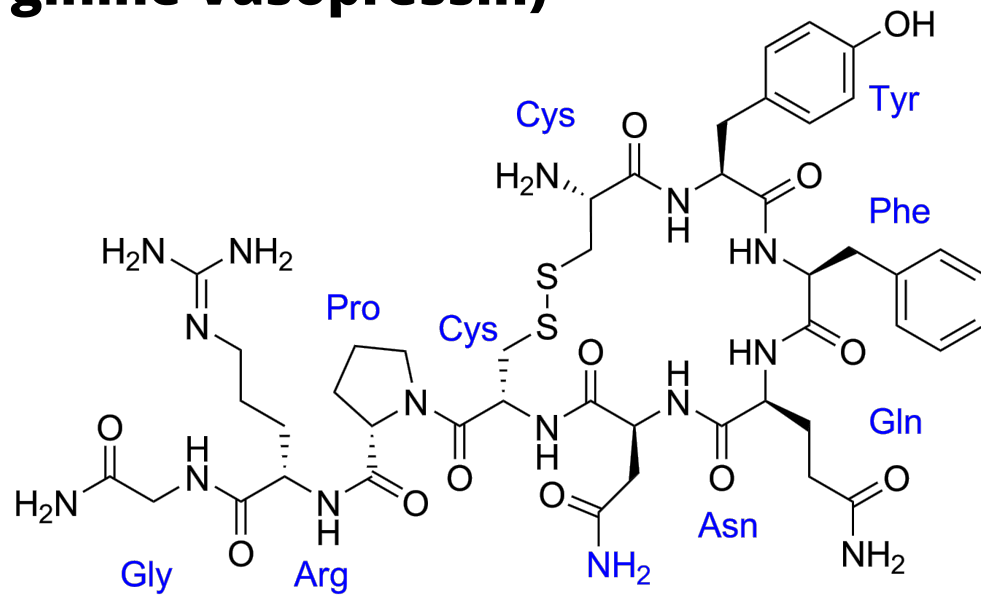
This decreases serum osmolality

12



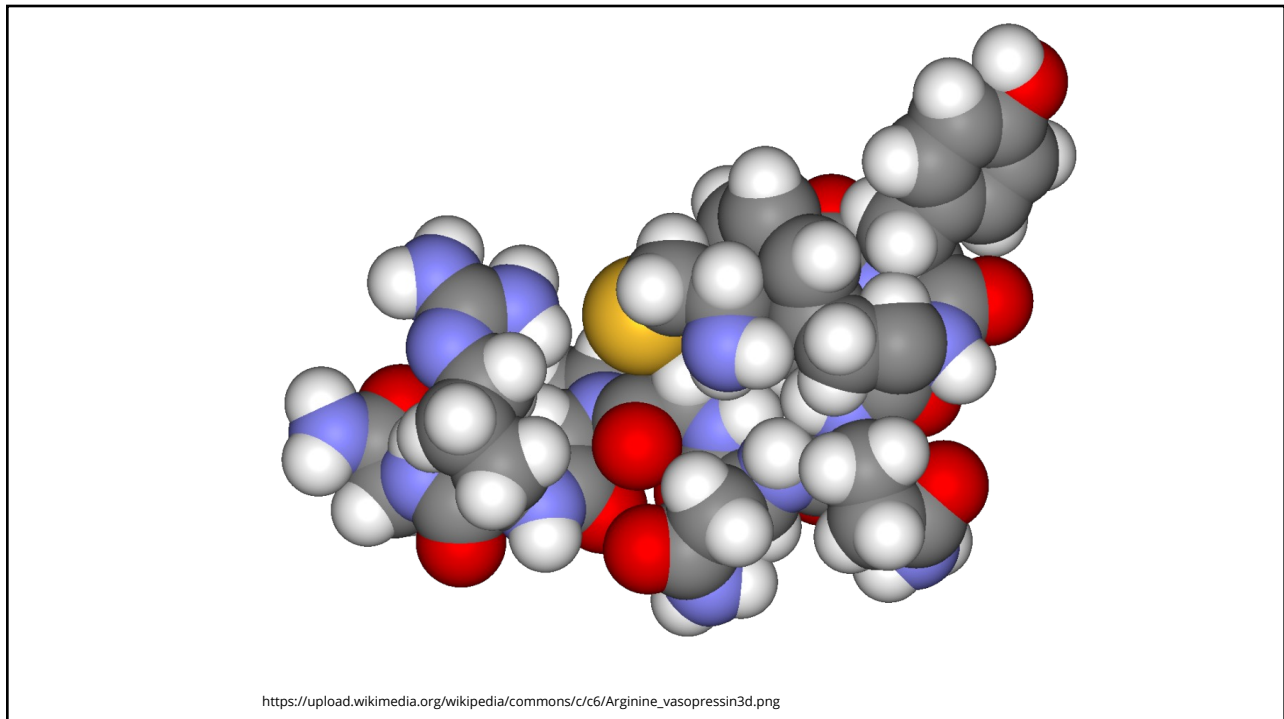
13

ADH (Arginine Vasopressin)



https://upload.wikimedia.org/wikipedia/commons/9/95/Vasopressin_labeled.png

14



15

What does ADH do?

The Hypothalamus measures serum osmolality
Osmoreceptors are in the anterior hypothalamus

When osmolality is elevated (becoming dehydrated,
more concentrated solute or less water)
ADH increases, urine output decreases
Fluid volume increases, serum osmolality decreases

When serum osmolality is low (becoming waterlogged)
ADH decreases, urine output increases
Fluid volume decreases, osmolality increases

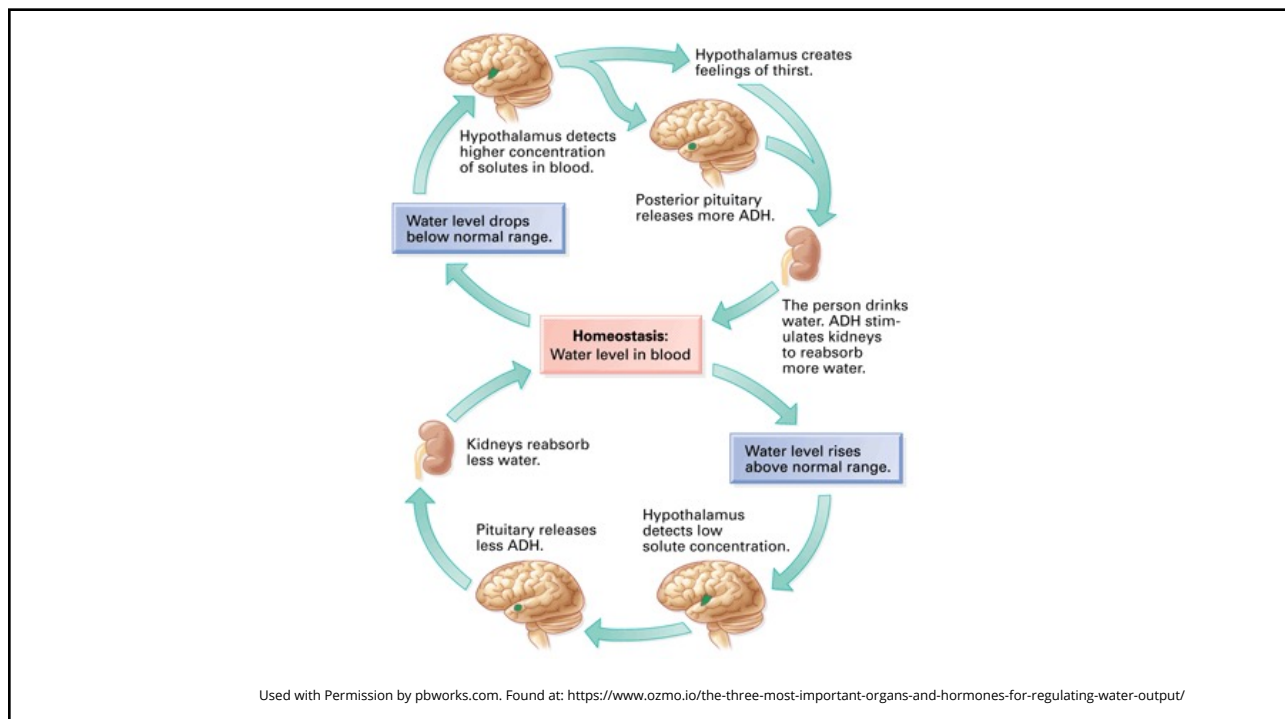
16

What does ADH do?

Negative feedback loop

- 1) Anterior Hypothalamus has osmoreceptors →
if osmolality is increasing → nerve signals
 - 2) In response, posterior Pituitary secretes ADH
 - 3) ADH works on kidney at collecting ducts
 - ▣ increases water reabsorption
 - Decreases urine output, concentrates urine
 - ▣ increases free water back to the blood
 - Decreases serum osmolality
- 1) Hypothalamus detects osmolality

17



18

What does ADH do?

if osmolality \uparrow , ADH \uparrow \rightarrow thirst \uparrow , make less urine, save free water \rightarrow Fluid volume \uparrow \rightarrow Na⁺ down

if osmolality \downarrow , ADH \downarrow \rightarrow thirst \downarrow , make more urine, waste free water \rightarrow Fluid volume \downarrow , \rightarrow Na⁺ up

19

Disorders Related to ADH

S \downarrow ADH

Diabetes \uparrow nsipidus

20

Disorders Related to ADH

S₁ADH – Syndrome of inappropriate ADH

Elevated ADH – decreased urine, decreased Na⁺

Causes: Most often tumor or head injury

Dx: ↑ urine osmo, ↓ serum osmo, ↑ urine Na⁺

Rx: Treat underlying problem, fluid/water restriction

21

Disorders Related to ADH

Diabetes insipidus

Decreased ADH – excessive urine, 4 causes

Nephrogenic – decreased ADH duct sensitivity

Central – decreased ADH secretion

Dipsogenic – drinking too much water

Pregnancy – rare, excessive vasopressinase

Dx: Water deprivation test while monitoring urine volume and concentration –or- test urine specific gravity

22

Disorders Related to ADH

Diabetes insipidus

Dx specific for Nephrogenic DI – Water deprivation test followed by a small dose of (IV) ADH

Rx: cause specific

Nephrogenic – Desmopressin

Central – Desmopressin

Dipsogenic – Drink less water

Pregnancy – Desmopressin, deliver baby

23

Disorders Related to ADH

Other possible disorders of ADH

Polyuria – >2L per day – there are other definitions

Urinary frequency – voiding more than 3-4x/day
There are other definitions

Nocturia –

>45 years of age, >1 per night

<45 years of age, any nighttime urination

24

Disorders Related to ADH

1° Nocturnal Enuresis

10% of 6 y/o, 1% of 18 y/o – mostly males

Causes: Delayed maturation, genetics, deep sleepers and decreased nighttime secretion of ADH

Dx: Hx, UA, Ur C/S, ADH

Rx: DDAVP (Desmopressin)

25

ADH and CRS

Most appropriate Dx – Urinary frequency or Nocturia

Cause: Decreased ADH or dysregulation of ADH/osmo

Dx: Hx, concomitantly drawn ADH and serum osmolality

Abnormal if ADH or osmo absolutely high or low

Dysregulated if: Osmo ≥ 292 and ADH ≥ 4.0 -or-

Osmo ≤ 278 and ADH ≤ 2.3

26

ADH and CRS

Rx: Shoemaker Protocol – 6th Step in the Pyramid

Several methods

Adults, Desmopressin 0.2 mg, qohs x 10 days, #5

Adults, Desmopressin 0.2 mg, BID x 30 days, #60

Children, DDAVP 1-4 sprays qhs x10-30 days

Super sensitive patients, DDAVP 4 sprays qhs

27

ADH and CRS

Shoemaker Protocol – 6th Step in the Pyramid

10 Day protocol – check Na⁺, K⁺, ADH/osmo at end

30 Day protocol – check Na⁺, K⁺, ADH/osmo q1-2 week

Children - check Na⁺, K⁺, ADH/osmo at end

Super Sensitive patients - check Na⁺, K⁺, ADH/osmo prn

28

ADH and CRS

Shoemaker Protocol – 6th Step in the Pyramid

Advise to skip dose if patient hasn't voided since the last dose

Side effects: Headaches, intensification-like reactions

Avoidable side effects: hyponatremia, seizures

29

ADH and CRS

Expected results

10 day protocol on someone voiding 8-10x a day or several times at night → durable decrease in frequency day and night

30 day protocol on someone voiding ≥ 18 times a day → reduction to 10-12 times a day

May need a second course immediately or later

30

ADH and CRS

Desmopressin vs. Vasopressin vs. DDAVP

Desmopressin

↓ urine production

NO change in BP

po, 0.1 or 0.2 mg/tab

Vasopressin (Vasostrict)

↓ urine production

↑ in BP

Intravenous

DDAVP = 4 mcg/mL = 0.4 mcg/spray

31

Takeaways

74% of CRS patients polyuria/nocturia/Ur frequency

~88% CRS adults with abnormal or dysregulated ADH/osmo

This may be D₁ but we do not do the tests to Dx: D₁

Rx: standardized, does not need to be scary

Be vigilant, however!

32

Contact Info

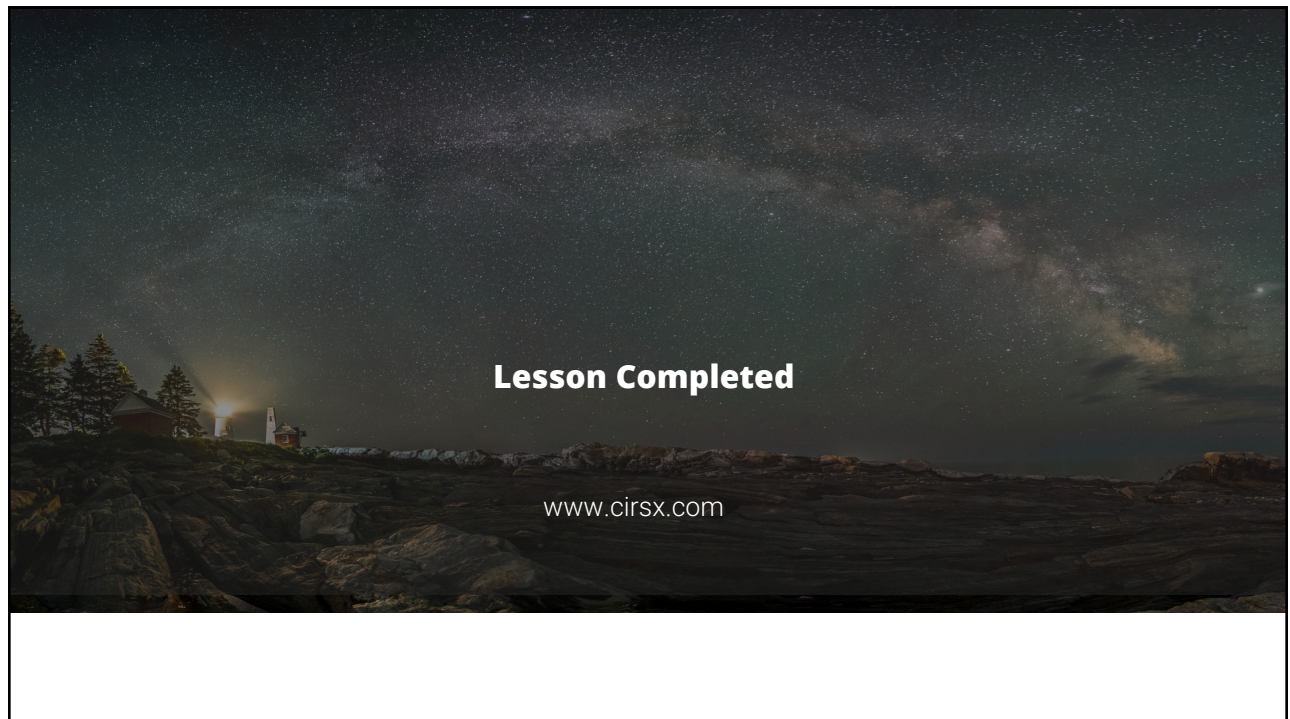
Scott W. McMahon, MD

Whole World Health Care

wwhcinfo@wholeworldheathcare.com

Office: 575.627.5571 Fax: 575.627.6430

33



34