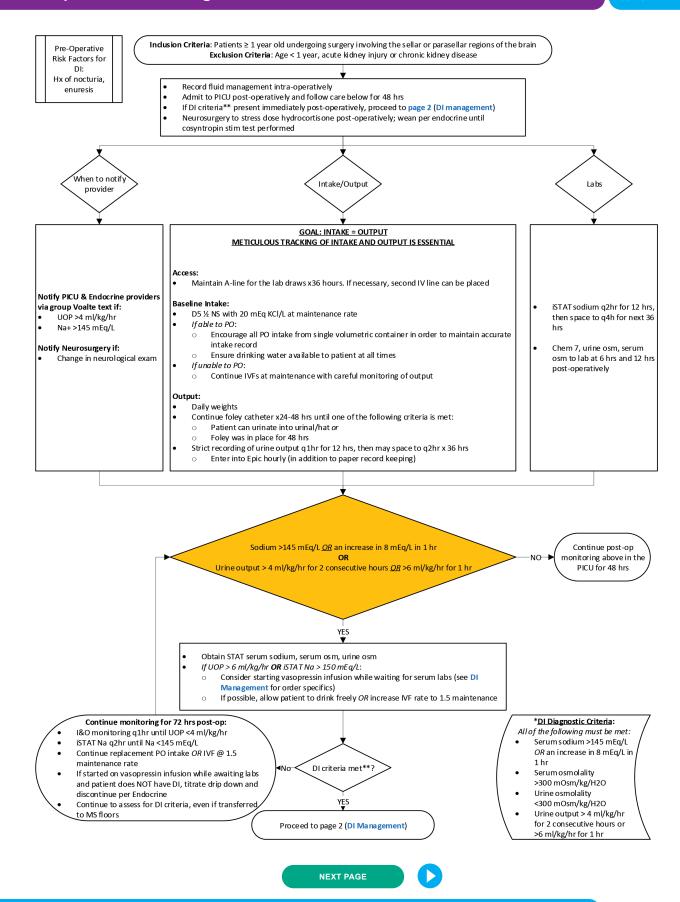
# CLINICAL PATHWAY:

# Diabetes Insipidus (DI) Post-operative Neurosurgical Management PICU Post-operative Monitoring for DI

THIS PATHWAY
SERVES AS A GUIDE
AND DOES NOT
REPLACE CLINICAL
JUDGMENT





## Diabetes Insipidus diagnosed if all of the following are met:

- Serum sodium >145 mEq/L OR an increase in 8 mEq/L in 1 hr
- Serum osmolality >300 mOsm/kg/H2O
- Urine osmolality <300 mOsm/kg/H2O
- Urine output > 4 ml/kg/hr for 2 consecutive hours or >6 ml/kg/hr for 1 hr

#### MEDICATION

- Order STAT Vasopressin IV infusion at 0.5 mU/kg/hr (max vasopressin dose of 5 mU/kg/ hr)
  - Call pharmacy in order to ensure timely (<30 min) delivery of the medication

## Titration of Vasopressin

- Titration for UOP:
  - Increase vasopressin by 0.5 mU/kg/hr every 30-60 min until UOP <3 ml/ kg/hr (max vasopressin dose of 5 mU/kg/hr)
- If UOP <1 ml/kg/hr x2 hrs:
  - Decrease vasopressin by 0.2 mU/kg/hr each hour, to no lower than 0.2 mU/kg/hr
- If UOP increases while decreasing vasopressin:
  - Increase infusion back up to the last rate

\*If UOP remains >4 ml/kg/hr after 4 hr on vasopressin: notify endocrine

# INTAKE/OUTPUT GOAL: INTAKE = OUTPUT METICULOUS TRACKING OF INTAKE AND OUTPUT IS ESSENTIAL

#### Access:

Maintain A-line and foley catheter as long as patient is on vasopressin

#### Baseline intake: record q1hr

- If able to drink PO <u>reliably</u><sup>1</sup>:
  - Discontinue/wean IVFs with goal of matching intake to output
     Encourage all PO intake from single volumetric container in
  - order to maintain accurate intake record

    Ensure drinking water available to patient at all times
  - If unable to PO:
  - Change IVFs to D5 ½NS w/20 mEq KCI/L at maintenance rate
  - Once tolerating PO, allow PO intake to thirst and discontinue/ wean IVFs with goal of matching intake to output
  - If unable to maintain PO (ie, input is <50% of output in the last 4 hours), use D5 ½NS to replace 1:1 (in ml) UOP minus PO intake, every 4 hours or sooner if needed (i.e., younger children have larger outputs)

#### Output: measure q1hr

Strict recording of urine output (UOP) q1hr

#### \*\*If Na >155 mEg/L:

- Place 2<sup>nd</sup> line for access
- Calculate free water deficit and replace with D5W over 12 hours ONE TIME within 24 hours, to a goal serum Na of 150 mEq/L
  - Rate of serum sodium decrease should be approximately ≤0.5 mEq/L/hr

#### LABS

- Serum sodium q2hr in the first 24 hrs after diagnosis; then can space out to q4hr
  - If Na >155 mEq/L at any time, must obtain 2<sup>nd</sup> access and replace free water deficit\*\*

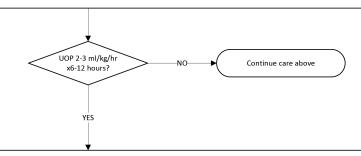
<u>LABS</u>

Serum sodium q4hr

Urine Osm q12hr

# <sup>1</sup>Signs of reliable PO drinking (i.e. intact thirst):

- Has accurate thirst with Na > 145 and significant thirst with Na > 150
- Is not thirsty if Na is < 135
- Is awake and alert without significant sedation
- Is allowed to PO ad lib (e.g. is not NPO for procedure)



# INTAKE/OUTPUT

- Intake:
  - Continue above care
- Output:
  - Assess for voiding and record volume q1hr beginning 2 hours before, and continuing 2 hours after, DDAVP dosing

# MEDICATIONS

- MEDICATIONS

  If sodium ≥140 mEq/L, start Desmopressin (DDAVP):
  - o ≥4 yrs old:
    - Initial: 0.05 mg PO once to twice daily
  - Titrate to optimal daily dose range: 0.1 0.8 mg/day in 2 divided doses
  - <4 yrs old:
    - DDAVP subQ
    - SubQ initial dosage: 0.05 mcg BID
       Dosing range of 0.1 1 mcg/day daily-BID
- If sodium <135 mEq/L:
- HOLD DDAVP and call endocrine

# Criteria for transfer to Med/Surg:

- Patient is stable with input = output and stable sodium levels on scheduled DDAVP (subQ or PO) for 24 hours after the last titration in the PICU
- See page 3 for Med/Surg care



RETURN TO THE BEGINNING







THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.

# Med/Surg Management for Diabetes Insipidus:

Patient is transferred from PICU when stable

(input = output and stable sodium levels on scheduled SubQ or PO DDAVP for 24 hours after the last titration)

Endocrine to direct care for DI management below

# Input = output Na+ 135-150 mEq/L

#### \_\_\_\_▼ Monitoring:

- Meticulous tracking of intake and output q4hr is essential
- Vitals q4hr
- Labs q12hr and are dependent upon thirst<sup>2</sup> (see below)

If more frequent monitoring of vital signs and I&Os are required, consider transfer back to PICU.

# Medications<sup>1</sup> Thirst not intact OR unsure if thirst is intact

#### **MEDICATIONS**

- Continue DDAVP dose established in PICU prior to transfer to Med/Surg
- If treatment goals\* are not met, additional DDAVP titration to the optimal range may be required:
  - ≥4 yrs old:
    - Initial: 0.05 mg twice daily PO
    - Titrate to optimal daily dose range: 0.1 – 0.8 mg/ day in 2 divided doses
  - o <4 yrs old:
    - DDAVP subQ
    - SubQ initial: 0.05 mcg BID
    - Optimal daily dose range:
       0.1 1 mcg/day daily-BID

# INTAKE/OUTPUT

METICULOUS TRACKING OF INTAKE AND OUTPUT IS ESSENTIAL

#### Intake:

Fluid intake goals = fluid maintenance goals for weight/BSA

#### If able to drink PO reliably1:

- Set fluid goal per shift (or 1<sup>st</sup> and 2<sup>nd</sup> half of the day between DDAVP doses)
- Goal: match intake to output
  - Encourage all PO intake from single volumetric container in order to maintain accurate intake record
  - $\circ \qquad \hbox{Ensure drinking water available to patient at all times}$

# If poor, or unreliable, PO intake: IVF replacement

- D5 ½NS with 20 mEq KCI/L at maintenance rate
- Once tolerating PO, allow PO intake to thirst and discontinue/wean IVF to match goal intake = output
- If unable to keep up with PO: use D5 ½NS 1:1 replacement
- Consider NG/PEG for long term management

# Output:

Intake = Output (1-2 ml/kg/hr)

# <u>LABS</u>

- iSTAT or serum sodium q12hr
- Draw before DDAVP doses if twice daily (or before AM DDAVP dose if on once a day dosing)

-NO-

Urine osm q12hr

#### INTAKE/OUTPUT

METICULOUS TRACKING OF INTAKE AND
OUTPUT IS ESSENTIAL

## Intake:

- Fluid intake goals = fluid maintenance goals for weight/BSA
- Ad lib PO intake to meet fluid intake goals Encourage all PO intake from a single
- volumetric container in order to maintain accurate intake record
- Ensure drinking water available to patient at all times

# Output:

- Intake = Output
- If output >2 ml/kg/hr in the last 4 hours, call endocrine

# <u>LABS</u>

- iSTAT or serum Na q12hr for 24 hours, then daily
  - Draw before DDAVP doses if twice daily (or before AM DDAVP dose if on once a day dosing)

# <sup>1</sup>Signs of reliable PO drinking (i.e. intact thirst):

- Has accurate thirst with Na > 145 and significant thirst with Na > 150
- Is not thirsty if Na is < 135</li>Is awake and alert without
- Is awake and alert without significant sedation
- Is allowed to PO ad lib (e.g. is not NPO for procedure)

# Are **both** of the following treatment goals\* met?

Input = Output

• Na+ 135-150 mEq/l

# If input does not equal output:

- Follow recommendations above to meet treatment goals\* for 24 hours:
  - DDAVP titration<sup>1</sup>, and
  - Adjust fluid goals based on thirst<sup>2</sup>

# If Na+ goals not met:

- If Na+ <135 mEq/L:</li>
- Hold DDAVP and assess input and output
- If Na+ >150 mEq/L:
   Titrate DDAVP and/or increase fluid volume
  - If Na+ >155 mEq/L AND UOP >4 ml/kg/hr:

    Consider transfer back to PICU for ICU level of care

Consider discharge home.

# Discharge criteria:

- Stable treatment goals\* for at least 24 hours on established DDAVP doses
- Family education/expectations and outpatient follow up plan completed and in place

# Discharge Instructions:

Discharge instructions and education by endocrine



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