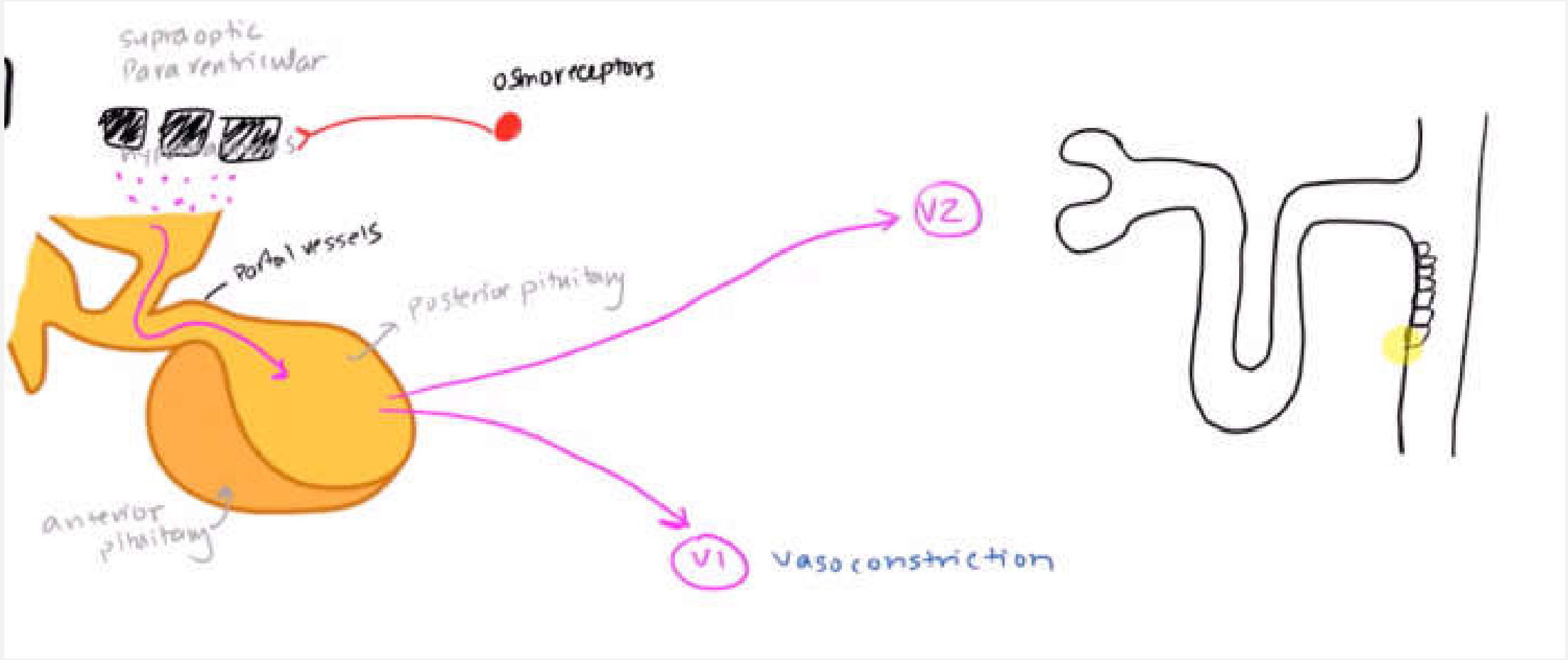
DIABETES INSIPIDUS (DI)

Abdullah Alenezi

Mohammed Lari

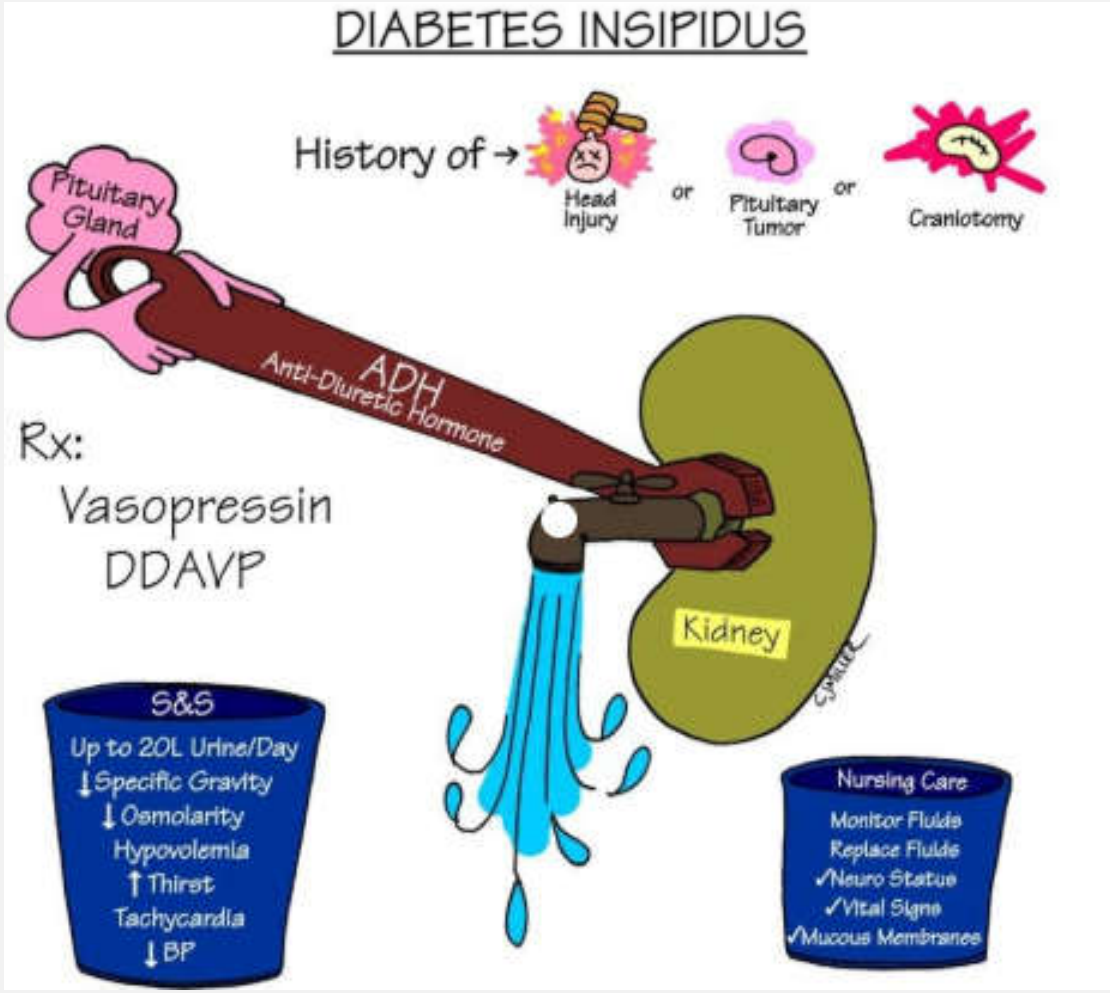
PHYSIOLOGY OF ADH



DEF. OF DI

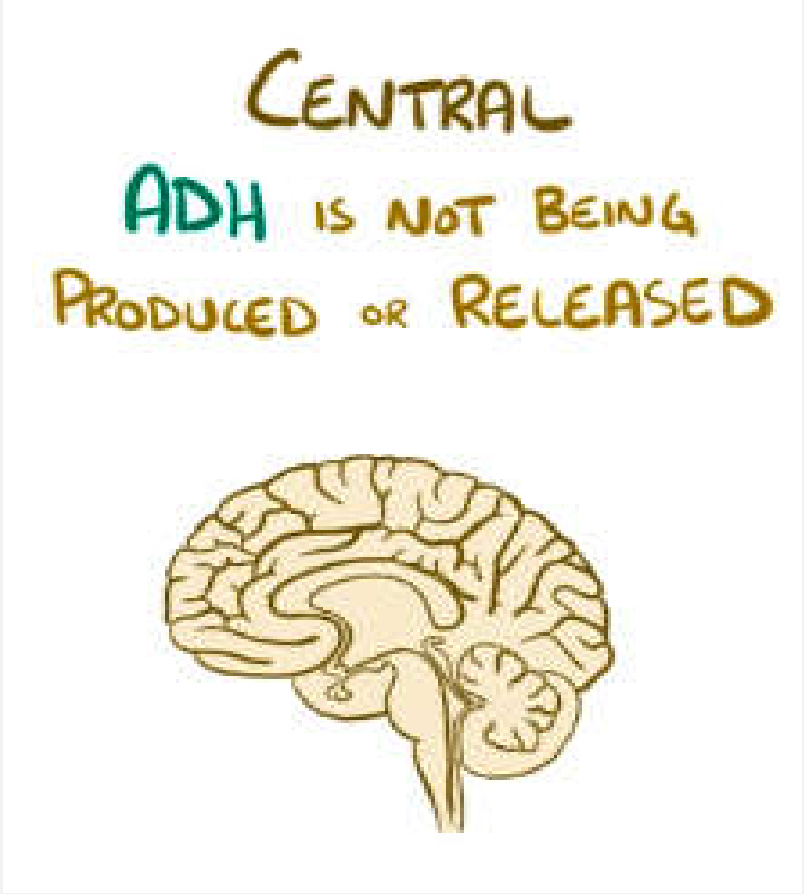
Diabetes Insidipus :

is defined as low ADH which can be due to decrease production of ADH(**central**) or decrease response to ADH **(Nephrogenic**)



TYPES OF DI

- **Neurogenic (central)\cranial) DI**
- **Most common form**
- DI caused by absence/↓ secretion/ production of antidiuretic hormone (ADH) by posterior pituitary



CAUSES OF CENTRAL DI

Idiopathic : destruction to hormone releasing cells

Neurosurgery : pituitary adenomas

Head trauma : triphasic response

- **polyuria phase** (4-5 days) low ADH
- **SIADH phase** (6-11 days) high ADH
- **permanent** DI low ADH

brain tumors : craniophyringioma ,cerebral metastasis(lung cancer)

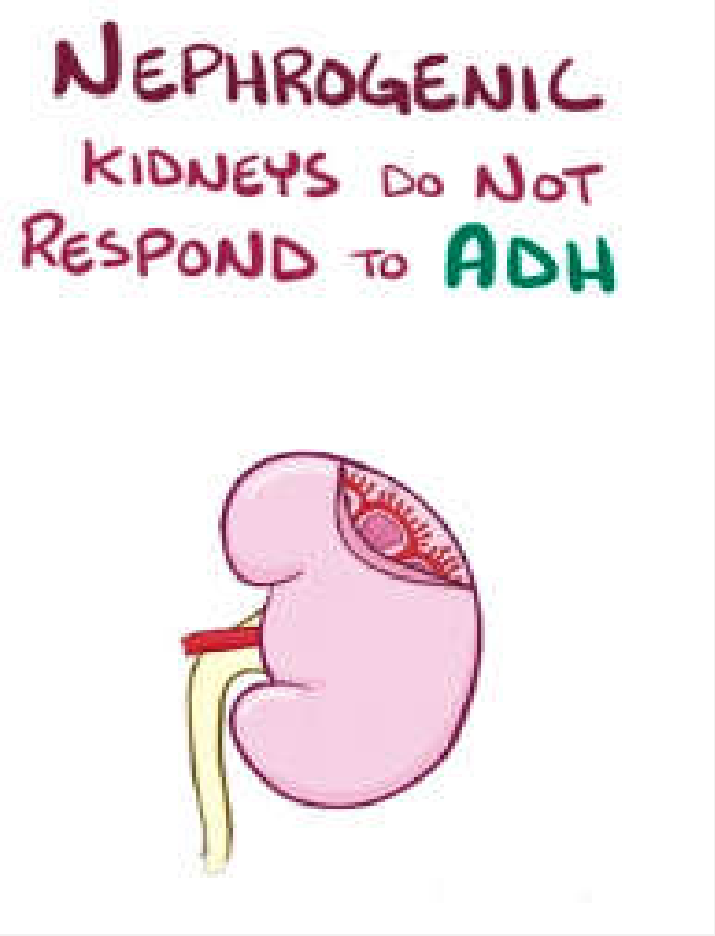
pituitary ischemia : Sheehan syndrome , stroke

infection : meningitis or Tb ..

TYPES OF DI

Nephrogenic DI

Kidneys unresponsive to ADH secreted by posterior pituitary



CAUSES OF NEPHROGENIC DI

-Hereditary (very rare) : v2 receptor mutation

Lithuim : in bipolar pt (Lithium enters the cells via the ENaC and inhibits Aquaporin 2

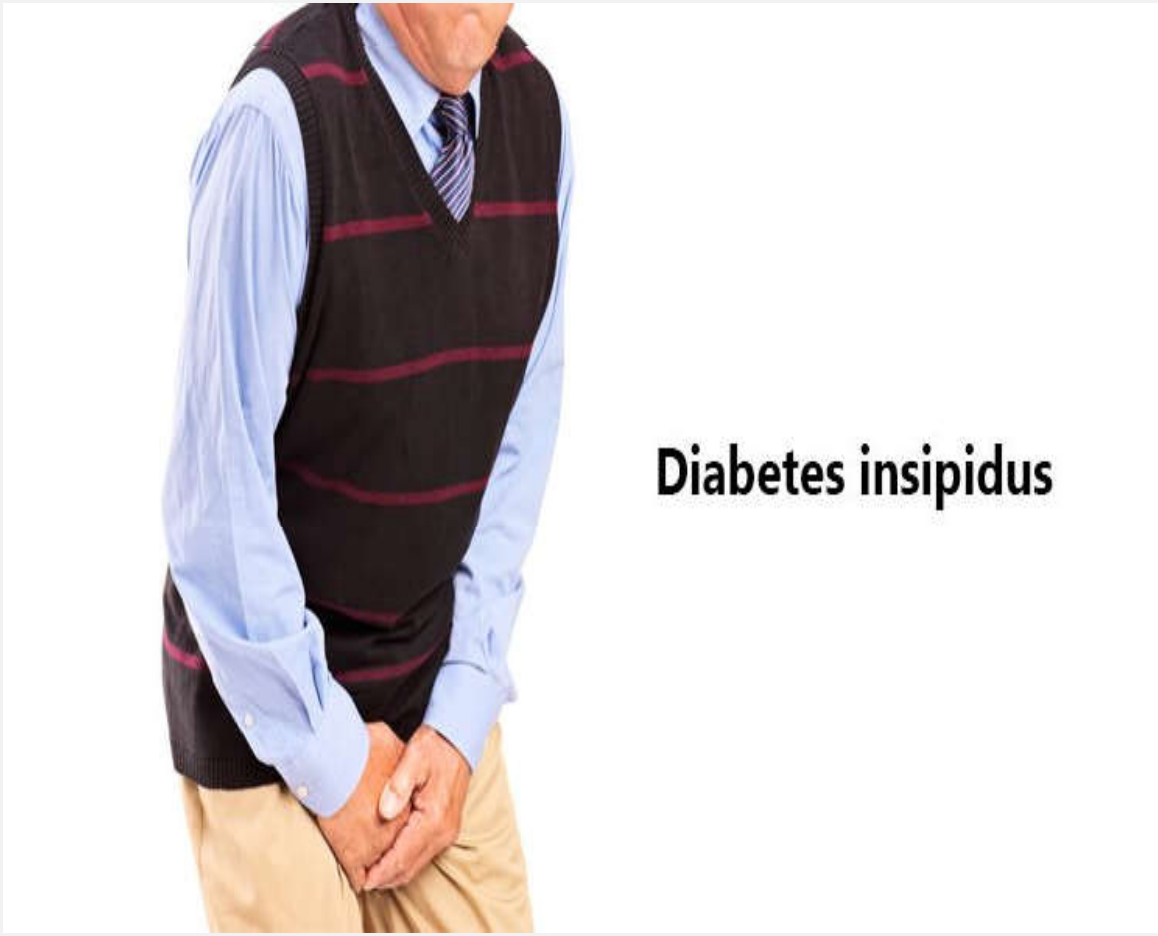
Elctrolyte imbalance

Hypercalcemia > 11 mg/dl .. reversable
hypokalemia ADH response

Renal disease : ADPKD , SCD , chronic pylonphritis …
drugs : demeclocyclin (SIADH) , foscarnet (CMV) , Colchicine
pregnancy : decrease ADH response

CLINICAL FEATURE

- **polyuria** with dilute urine
- **Polydipsia**
- **Nocturia** → (presenting complaint) . Restless sleep, daytime sleepiness
- **Hypernatermia** (infants , bedridden eldrely)



DIAGNOSIS DI

- **1 . Must exclude DM first (urinalysis and blood glucose)**
- **Exclude hypercalcemia and hypokalemia**
- **2 . confirm the polyuria (24hours urine volume > 3 L)**

- **If polyuria is confirmed do further investigations**
  - urine volume , urnie osmolarity (every hour)
  pNA , P osmolarity (every 2 hours)

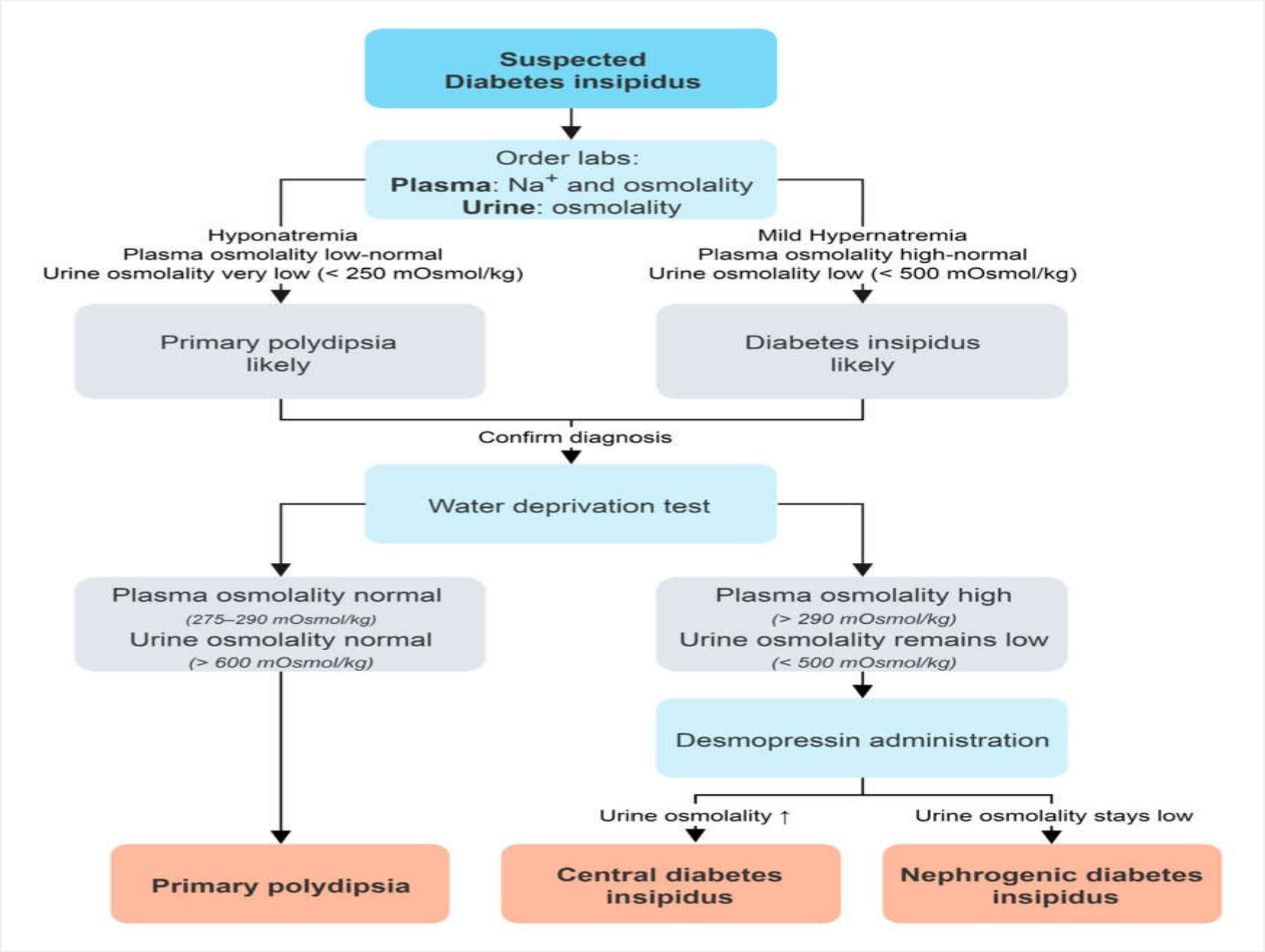
- **Labs results can differentiate btw primry polydypsia (low pNa)/low urine osm and DI (High pNa) / low urnie osm**

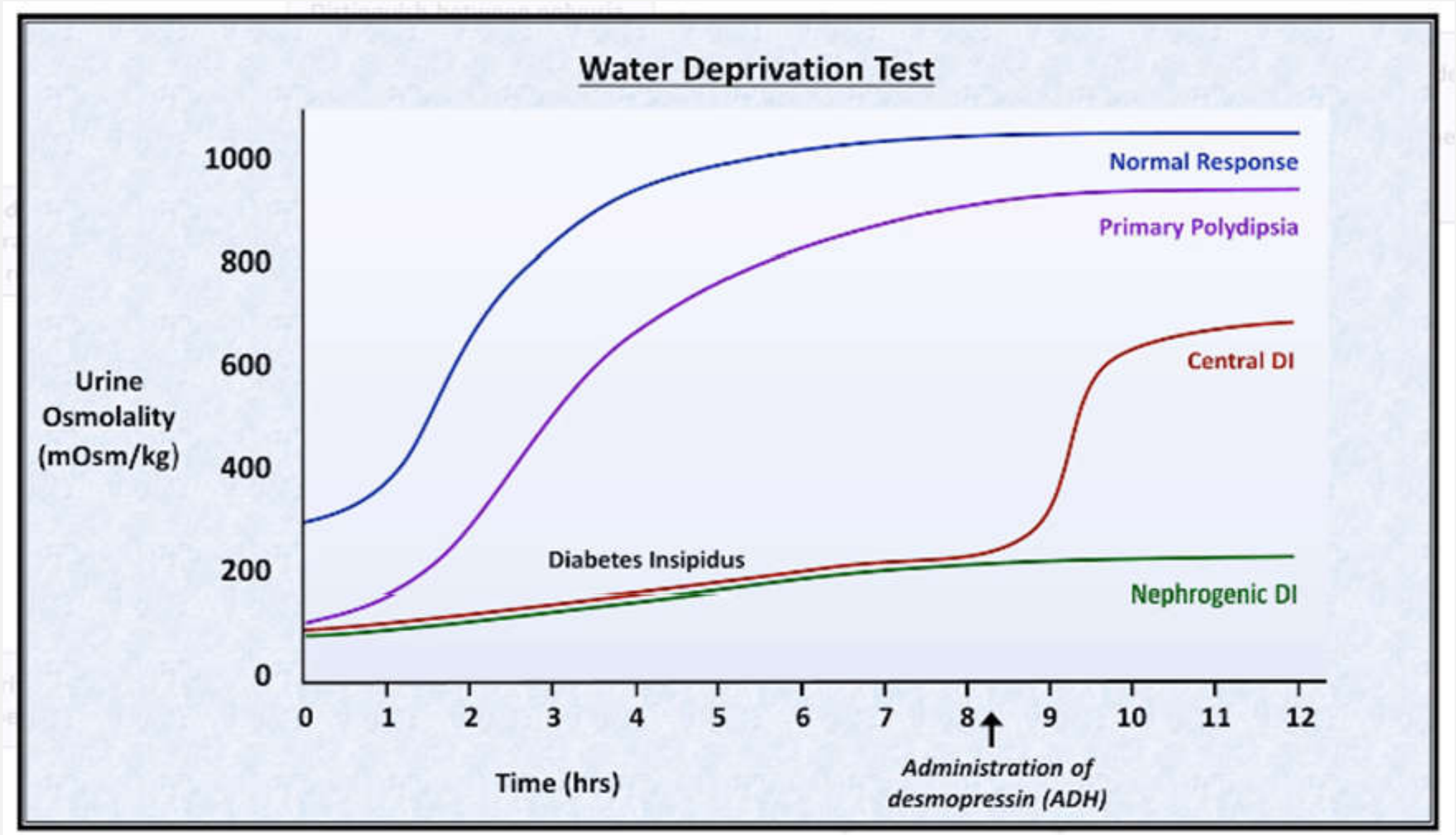
SPECIAL TESTS

Water deprevation test

Desmoression test
ADH analogue

	Urine Osmolality (mOsm/kg)	
Diagnosis	**After fluid deprivation**	**After desmopressin**
Neurogenic DI	<300	>800
Nephrogenic DI	<300	<300
Primary Polydipsia	>800	>800
Partial DI or Polydipsia	300-800	<800


Suspected Diabetes insipidus
Order labs:
Plasma: Na+ and osmolality
Urine: osmolality
Hyponatremia
Plasma osmolality low-normal
Urine osmolality very low (< 250 mOsmol/kg)
Mild Hypernatremia
Plasma osmolality high-normal
Urine osmolality low (< 500 mOsmol/kg)
Primary polydipsia likely
Diabetes insipidus likely
Confirm diagnosis
Water deprivation test
Plasma osmolality normal
(275–290 mOsmol/kg)
Urine osmolality normal
(> 600 mOsmol/kg)
Plasma osmolality high
(> 290 mOsmol/kg)
Urine osmolality remains low
(< 500 mOsmol/kg)
Desmopressin administration
Urine osmolality ↑
Urine osmolality stays low
Primary polydipsia
Central diabetes insipidus
Nephrogenic diabetes insipidus


Water Deprivation Test
Urine Osmolality (mOsm/kg)
1000
800
600
400
200
0
Normal Response
Primary Polydipsia
Central DI
Diabetes Insipidus
Nephrogenic DI
0
1
2
3
4
5
6
7
8
9
10
11
12
Time (hrs)
Administration of desmopressin (ADH)

TREATMENT OF DI

- **For primary polydypsia** decrease water intake
  for CDI
  -desmopression IN , SQ
- **-NSAIDS** (PG decrease ADH)
  -clorpramide (DM drug)
- **-carbamazipine**(anti seizure)

} increase response to ADH

- **For NDI**
- **THIAZIDES diuretics** (HCTZ ,
  AMILORIDE (Enac channel inhibitor) used with pt taking lithium
- Put pt with CDI/NDI on **low sodium and protein diet**

THANK YOU