WATER DEPRIVATION TEST

Indications

Diagnosis of diabetes insipidus (DI) vs primary polydipsia.
Differential diagnosis of cranial DI and nephrogenic DI.

Contraindications

None in the fully hydrated patient.

Precautions

Take care to avoid severe dehydration (in patients with severe DI).
Thyroid function and adrenal reserve must be normal , or replaced.

Pre-procedure

- Usually arranged for Wednesday (non-clinic day). Give appointment for 08:15. Explain test fully and give patient 'WDT patient information letter'.
- Lab. require prior warning, preferably one week. Discuss with biochemist if a day other than Wednesday is required.
- Check that registrar will be available to supervise test.
- Patients **do not need to fast** - allowed free access to food and fluid until 08:30am.
- Patients on DDAVP should omit DDAVP at least 24 hours before test.
- Patients on steroid replacement therapy should take normal dose before test.
- Diuretics should not be taken on morning of test.
- Check stock of Desmopressin (DDAVP) for IM injection.
- Request dry meal for patient's lunch.
- Request case notes, and record date notes requested on form and diary.

Procedure

- One nurse dedicated to test. Explain test fully to patient. Fluids and smoking are forbidden throughout test. Patient must remain in Metabolic Unit throughout test.
- Notify lab. of delays in starting, if protocol is modified, and when test is stopped.
- Use same scales throughout test to weigh patient.
- Patient should empty bladder completely, **prior to checking weight.** A 'named' urine measuring jug should be used. **All urine passed must be collected and volume recorded on chart, throughout test**. Use graduated measuring beakers for accuracy.
- Discourage patient from urinating other than at collection times. If they must, save an aliquot and send to lab. **only** if patient is unable to pass urine at collection time.
- Use WDT chart to record measurements and results. Use separate thirst scale form each time.
- **Take steps to prevent surreptitious fluid intake**. Patients should not use the Unit toilet: a commode with disposable bedpans should be used in the room. Tap in room should be taped.

Timing

08:30 Urine sample. Dipstick sample and record results on WDT form. Record thirst score.
Record basal weight and calculate 97% of this (weight x 0.97).
09:00 Blood samples Na, K, urea, glucose, osmo & ionized Ca and any additional requests.
09:30 Urine sample. Record thirst score. **Send first batch to lab.**
11:30 Urine sample. Record thirst score. Record weight.
12:00 Blood samples. Na, K, urea, glucose, osmo.
12:30 Urine sample. Record thirst score. **Send second batch to lab.**
Record weight of dry lunch & serve.
14:30 Urine sample. Record thirst score. Record weight.
15:00 Blood samples. Na. K, urea, glucose, osmo.
15:30 Urine sample. Record thirst score. Record weight. **Send third batch to lab.**
16:30 Blood sample. Na, K, urea, glucose, osmo.
Urine sample, Record thirst score. **Send fourth batch to lab.**

Tubes and forms

Samples are sent in batches at: **09:30 12:30 15:30 16:30**.

- Send **one** request form with each batch. Telephone lab. when sending each batch. Note bleep no. 8485 on forms, lab. will telephone results.
- 1 x 2.7ml Li hep (orange) tubes for: Na, K, urea, glucose, osmo at each sample time.
- Blood gas syringe at 09:00 for ionized calcium sample. **Mix well, store in fridge** and send with cool pack at 09:30**.**
- Urine samples for osmo are sent in universal containers - aliquot from volumed urine - note sample time & total volume (TV) on forms and containers .
- Any additional blood tests requested should be collected with the baseline samples at 9am and sent with first batch and a separate request form.

Interpretation & further action

Plasma osmo **< 258**	Has patient had DDAVP? Consider primary polydipsia.
Plasma osmo **< 295** & urine osmo **> 600**	Normal response. **Stop test.**
Plasma osmo **< 295** & urine osmo **< 600**…	…after 8 hours = inadequate dehydration. Consider longer water deprivation. Did the patient drink?
Plasma osmo **296 - 299** & urine osmo > **600**	Normal urinary concentration but consider other solutes: urea, glucose, alcohol (yellow tube).
Plasma osmo ≥ **300** & urine osmo > **600**	?essential hypernatraemia/?other solutes. Check urea, glucose, alcohol (yellow tube). Note thirst score
Plasma osmo ≥ **300** & urine osmo < **600**	**Indicates diabetes insipidus.** If Na^+ is not elevated, consider other solutes: urea, alcohol, glucose. Otherwise, **stop test and give DDAVP.**

Ending the test

Inform registrar on call of results.
The test is stopped if at any point weight falls below 97% of baseline weight. DDAVP may be administered depending on results.
If DDAVP is to be given:

- Bladder is emptied, total volume recorded and aliquot of urine saved.
- **DDAVP 2mcg IM is given. Note time and allow patient free access to fluids.**
- Collect urine at + 1 hour and at + 2 hours after DDAVP. If DDAVP is given after 17:00 the samples should be stored overnight in fridge and dispatched on next working day, stating time of DDAVP administration on the accompanying request form. If appropriate patient may be provided with measuring jug and universal containers and asked to collect +1 hour and + 2 hour samples, store in fridge overnight and return following morning with samples.

Protocol developed by Dr R Lindsay 1996, Western General Hospital, Edinburgh. Reviewed 2000 and 2006.