

Department:	Biochemistry		
Site	All sites	Revision No:	4
Document title:	Endocrine Dynamic Function Test Protocols - Adults		

## Arginine-stimulated Co-peptin test for Diabetes Insipidus

Administration of arginine acts as a stimulus to the posterior pituitary thus increasing AVP secretion. Serum copeptin, the C-terminal glycoprotein of the AVP prohormone, is measured as a more stable marker of AVP secretion and is present in approximately equimolar concentrations. Serum copeptin and AVP levels have been shown to agree well.

### Indications

The primary goal of this test is to diagnose Diabetes Insipidus (DI) and specially to distinguish the different entities of Hypotonic Polydipsia- polyuria Syndromes (Central / Nephrogenic DI and Primary Polydipsia) particularly if hypertonic saline test is contra indicated.

### Contra indications

If diagnosis and treatment of DI is urgent consider Water deprivation test or hypertonic saline infusion test, as the usual turnaround time for co-peptin results is 3 weeks.

Random co-peptin levels > 21.4pmol/L suggests Nephrogenic DI and if levels < 21.4pmol/L to proceed with Arginine stimulated co-peptin test.

### Side effects

- Arginine can cause nausea and some irritation at the infusion site and the patient should be made aware of this.
- Potential rare side effects include headache, vomiting, vertigo and facial paraesthesia and to be noted in case record.
- Arginine can cause vasospasm so sampling may be difficult if only one cannula is used. For this reason large veins should be selected.
- Ensure patient is recumbent during procedure (BP may fall by 20-30 mmHg in first 30 mins).

### Requirements

- Arginine 2 x 100ml of 20% (each 100ml bottle contains 20g L-Arginine)
- Normal saline (0.9% saline)
- 4 brown top serum tubes
- (note orange Li Hep tubes also acceptable for copeptin)
- *iv* cannula

### Procedure

#### PATIENT PREPARATION

- Stop DDAVP 24 hours beforehand in patients already on treatment. The requesting Endocrine team to supervise the discontinuation and fluid intake advice.
- Ensure patient has fasted from midnight but are allowed to drink fluids until 2 hrs before start of the test.
- If the patient is on any other hormone replacement tablets, these should be taken as usual.

Author:	Katharine Hayden	Document No:	BC-CL-PR-16
Approved by:	Anne-Marie Kelly	Page 38 of 47	

Department:	Biochemistry		
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## TEST

**Inform the Biochemistry laboratory that the samples for copeptin will be arriving so that samples can be processed promptly. Samples should arrive within 2hrs.**

- Record Weight, Blood pressure and Pulse at the start of test.
- Insert intravenous cannula in antecubital fossa and allow patient to rest for 30 mins.  
**Important to insert a PINK/GREEN cannula as Arginine constricts the blood vessels**
- Take baseline blood samples for serum sodium, Osmolality and Co-peptin
- Infuse Arginine over 30 mins, at a dose of 0.5 g/kg bodyweight (max 40g) diluted in 500mls 0.9% saline. Once infused, flush the cannula well with normal saline.
- Take blood samples at 60 mins for serum sodium, Osmolality and Co-peptin.
- Remove cannula.
- Patient can have food, drink and DDAVP (if already taking) after the test is concluded.

Minutes	Procedure	Samples
0 (Baseline)	Take samples for <b>sodium, osmolality and co-peptin</b>	1 x brown top serum (osmolality, Na)  1 x brown top serum (copeptin)
0	Infuse L-arginine hydrochloride over 30 minutes at a dose of 0.5g/kg (max 40g) in 500mLs 0.9% saline	
240	Take samples for <b>sodium, osmolality and co-peptin</b>	1 x brown top serum (osmolality, Na)  1 x brown top serum (copeptin)

**Note** Samples will need to be requested individually in EPIC as not included currently as a requestable DFT. Please record 0 min (Baseline) and 240 min sample in reason for request.

## Interpretation

If, at 60 min after Arginine infusion, serum co-peptin is <3.8 pmol/L, then the diagnosis is Central DI

If the serum co-peptin is >3.8 pmol/L, then the diagnosis is likely to be Primary Polydipsia.

## Reference

Arginine-stimulated copeptin measurements in the differential diagnosis of diabetes insipidus: a prospective diagnostic study. The Lancet (2019) online [http://dx.doi.org/10.1016/S0140-6736\(19\)31255-3](http://dx.doi.org/10.1016/S0140-6736(19)31255-3)

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