Harmonization of Protocols for Dynamic Endocrine Testing (HPDET)

A/Prof Rory Clifton-Bligh

Kolling Institute of Medical Research, University of Sydney

On behalf of the HPDET Working Group

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HPDET Working Group

- Cherie Chiang (chair) (Vic)
- Tina Yen (Vic)
- Rory Clifton-Bligh (NSW)
- Peter Ward (NSW)
- Mark Cooper (NSW)
- Penny Coates (SA)
- Ee Mun Lim (WA)
- Warrick Inder (QLD)
The power of collective knowledge
The pitfall of collective knowledge
An aspirational aim
Endocrinology Handbook
Imperial Centre for Endocrinology
Imperial College Healthcare NHS Trust
Charing Cross, Hammersmith and St. Mary’s Hospitals

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First published: 1988

BARTS ENDOCRINE E-PROTOCOLS
PITUITARY FUNCTION

www.bartsendocrinology.co.uk
“Dynamic endocrine testing is the cornerstone of practice in endocrinology and plays an important role in clinical decision-making. Structured and standardized testing protocols are also very important for billing and compliance with high quality standards. However, evidence-based national guidelines for these tests are unfortunately missing”

Preface, The Cleveland Clinic Manual of Dynamic Endocrine Testing
Possible?

- Protocols generally don’t change much…

- BUT need to be adaptable to change in patients/lab tests etc
Strategy

- Inclusivity
- “Buy-in” from ESA and AACB
  - (also APEG, NZES)
- Evidence-based
- Pragmatism
- Promotion of national expertise

We want national guidelines for endocrine dynamic protocols

Great idea! You can use ours!
Dynamic Endocrine Testing

How to catalog?

- Stimulation vs suppression tests
- By clinical presentation
- By organ system
Dynamic Endocrine Tests I

- **Cushing’s Syndrome**

  1. Dexamethasone suppression testing
     - Overnight
     - Low dose
     - High dose
     - (IV)
  2. Bilateral Inferior Petrosal Sinus Sampling
  3. CRH test (without IPSS)
  4. BMAH testing
Dynamic Endocrine Tests II

- Adrenal Insufficiency

1. Synacthen test
   - Low dose
   - High dose
   - (salivary cortisol)
2. Insulin tolerance test
3. Metyporone test
4. Synacthen test for CAH
Dynamic Endocrine Tests III

- **Hyperaldosteronism**
  1. Saline suppression test
  2. Fludrocortisone suppression test
  3. Adrenal venous sampling
  4. Glucocorticoid suppressible hyperaldosteronism
Dynamic Endocrine Tests IV

- Phaeochromocytoma
  
  1. Clonidine suppression test
  2. Adrenal venous sampling
Dynamic Endocrine Tests V

- **Growth Hormone Deficiency**
  1. Insulin tolerance test
  2. Arginine test
  3. Exercise test
Dynamic Endocrine Tests VI

- Growth hormone excess
  1. Glucose suppression test
Dynamic Endocrine Tests VII

- Diabetes insipidus

1. Water Deprivation test
Dynamic Endocrine Tests VIII

- Hypoglycaemia
  1. Three day fast
  2. Mixed meal test
  3. Selective arterial calcium stimulation (also used for gastrinomas)
Dynamic Endocrine Tests IX

- Diabetes
  1. Oral glucose tolerance test
Dynamic Endocrine Tests X

- **Gonadal**
  1. GnRH test
  2. Progesterone challenge test
  3. Ovarian vein sampling
Dynamic Endocrine Tests XI

- **Thyroid**
  1. Thyroglobulin stimulation in thyroid cancer follow-up
     a. Thyroid hormone withdrawal
     b. rhTSH stimulation
  2. TRH test for TSH deficiency
  3. T3 suppression test
  4. Octreotride suppression test
Dynamic Endocrine Tests XII

- Hyperparathyroidism
  1. Calcium suppression test
  2. Selective venous sampling for PTH
Dynamic Endocrine Tests XIII

- Bone biopsy for dynamic histomorphometry
  1. Tetracycline labelling

- FGF23
  1. Venous sampling
Process

- Collate protocols currently in use
  - ask EELS members to email their local dynamic test protocols (all of them if possible).
  - review by advisory group
- “Harmonised” template for all dynamic tests
- Mutually agree to **single standardised protocol** for test
  - include evidence base and/or commentary from Australasian experts.
  - define times, specimen types, and reporting units.
  - optional topics: analytical method (immunoassay, LCMS), decision points.
- Review at combined ESA/AACB National meeting?
- Sign off and circulate protocol as recommended standardised protocol
- Publication
Suggested Template

- Indication
  (including preliminary endocrine tests)
- Contra-indications
- Preparation
  (including safety features)
- Method
- Interpretation
  (Bayesian)

- “Standard” protocol
- “Variations”
## SYNACTHEN TEST

### INDICATION
Suspected hypoadrenalism  
The patient should have had a morning serum cortisol already measured: if <100 nmol/L or >450 nmol/L, then a synacthen test is not indicated

### CONTRAINDICATION
Pregnancy; allergy to synacthen

### PREPARATION
Patient arrives non-fasting, ideally 0900  
If on hydrocortisone the final dose of hydrocortisone should be at midday, on the day prior to the test.  
HRT or any oestrogen should be discontinued for 6 weeks before the test.

### METHOD
1. baseline: take 7 ml blood for cortisol (red or yellow top Vacutainer) and ACTH (purple top, on ice to lab immediately).  
2. Give 250 micrograms tetracosactride i.m. (ideally) or i.v.  
3. +30 mins: Take 3 ml blood for cortisol.  
4. +60 mins: Take 3 ml blood for cortisol.

### INTERPRETATION
- Normal response if test done at 0900h (considerable diurnal variation): Stimulated plasma cortisol* 450 nmol/L or above at 30 minutes  
- If impaired cortisol response, and ACTH >200 ng/L then diagnosis is primary adrenal failure.  
- If ACTH <10ng/L then diagnosis is secondary adrenal failure.

*Abbott Architect cortisol assay

Adapted from ICE Endocrinology Handbook
Progress so far

- ESA council has been approached
- Once we have the ESA official letter, respective heads of departments will be invited to participate and contribute
- ESA ASN next year to discuss / get feedback for the draft protocol
- Agreed template first, then we populate it with the straightforward tests, then we discuss the more controversial ones
Still to do

- Pediatric endocrinology input
- NZ endocrinology input
- Dynamic protocols for PET imaging
One hour on this planet is 7 years on Earth

Great!

We’ll do the HPDET here