

Chemiluminescence assays by IDS for adrenal function.



Physiology

The hypothalamic-pituitary-adrenal axis:



1

Corticotropin-releasing hormone (CRH) is secreted by the hypothalamus in response to stress

2

The peptide **adrenocorticotrophic hormone (ACTH)** is secreted by the anterior pituitary gland in response to CRH

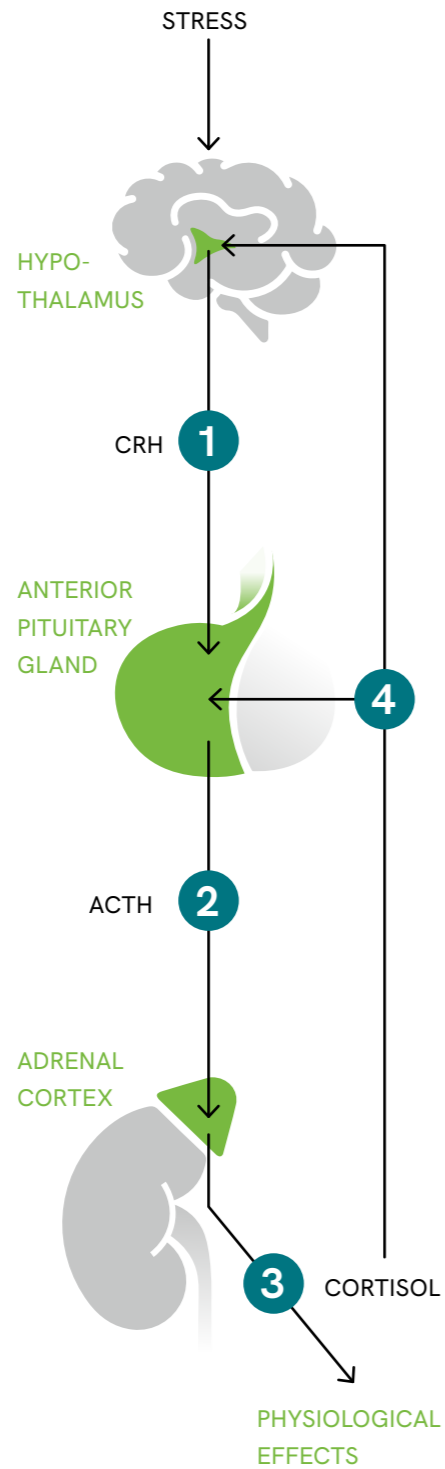
3

Cortisol is a steroid hormone secreted by the adrenal gland that regulates a wide range of processes¹, including:

-  Blood sugar levels
-  Heart rate
-  Blood pressure
-  Immune response
-  Metabolism
-  Growth

4

Cortisol regulates the secretion of CRH and ACTH via a negative feedback loop



ACTH and cortisol concentrations are evaluated for disorders caused by hyper- and hypo-cortisolism

Available assays



IDS Cortisol (IS-4600)

Use the IDS Cortisol assay to determine cortisol levels in serum and plasma.



IDS Salivary Cortisol (IS-4900)

Use the IDS Salivary Cortisol assay to determine cortisol levels in saliva.



IDS Urinary Cortisol (IS-5800)

Use the IDS Urinary Cortisol assay to determine cortisol levels in urine.



IDS ACTH II (IS-4500NG)

Use the IDS ACTH II assay to determine ACTH levels in plasma.

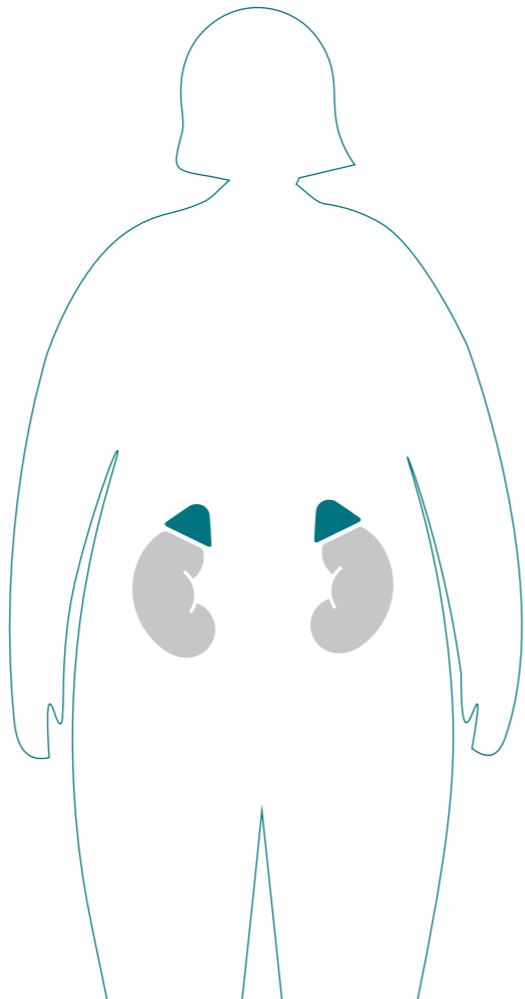
The key areas of clinical use for ACTH and cortisol

Cushing's syndrome (CS)

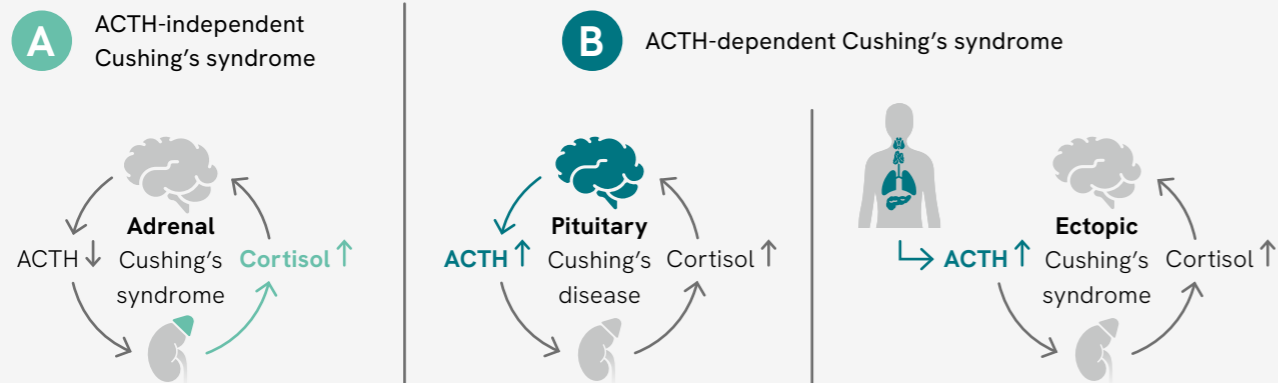
is characterised by a large group of signs and symptoms due to exposure to hypersecretion of cortisol.

Possible signs and symptoms:

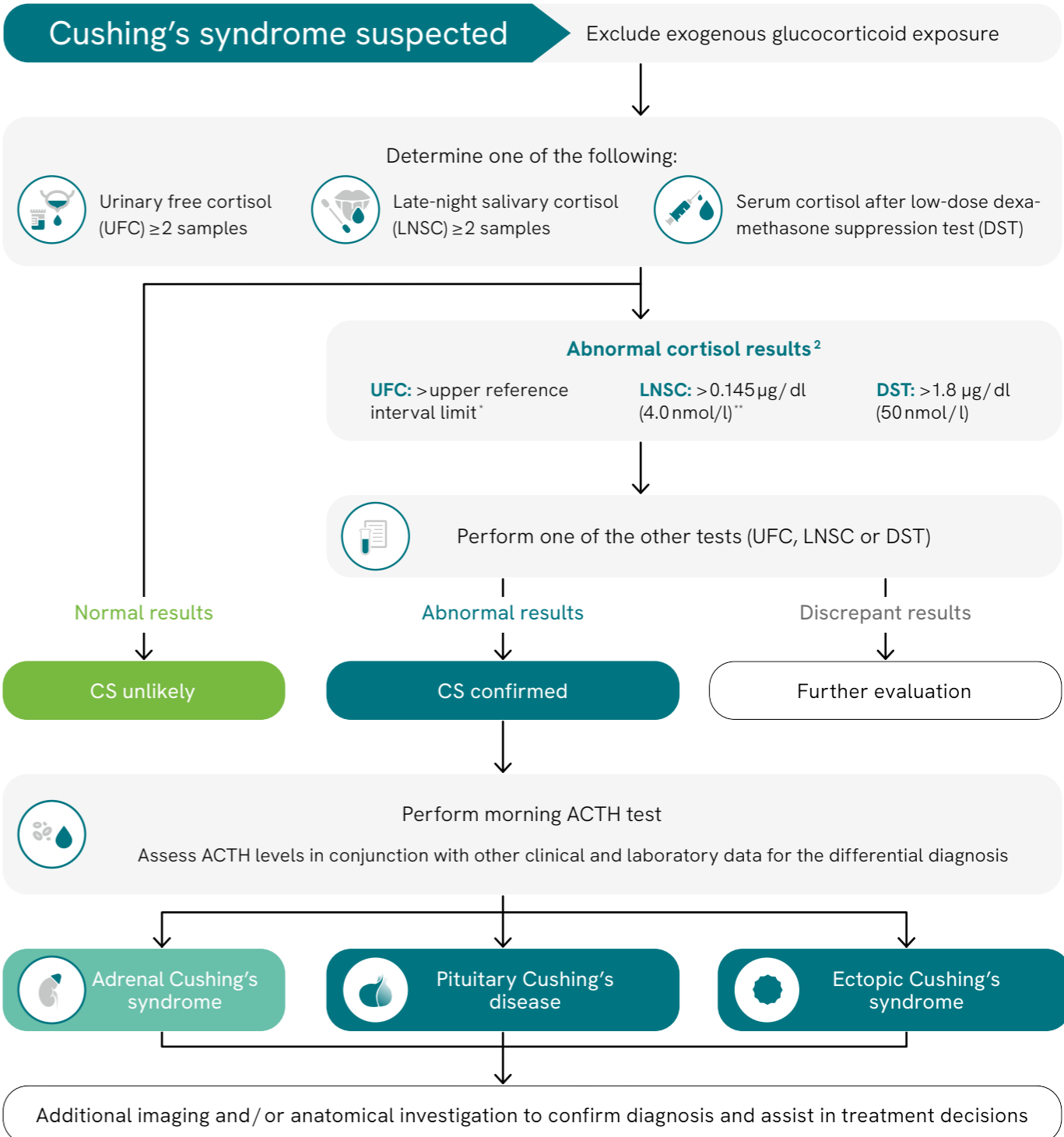
- Weight gain
- High blood pressure
- Poor memory
- Red stretch marks
- Moon-shaped face
- Altered hair growth



Subtype differentiation:



Testing algorithm (adapted from the Endocrine Society guidelines²)



* For the IDS reference interval, consult the IDS Urinary Cortisol (IS-5800) instructions for use.
 ** The cut-off recommended by IDS is 0.1 µg/dl⁴ (publication available upon request).

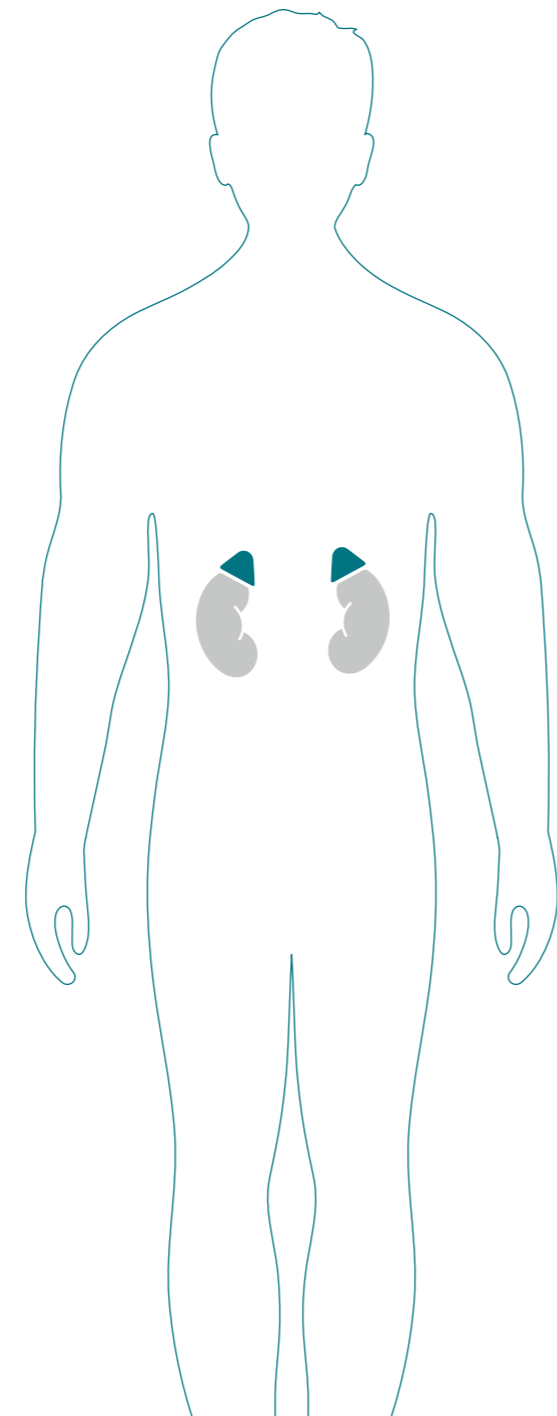
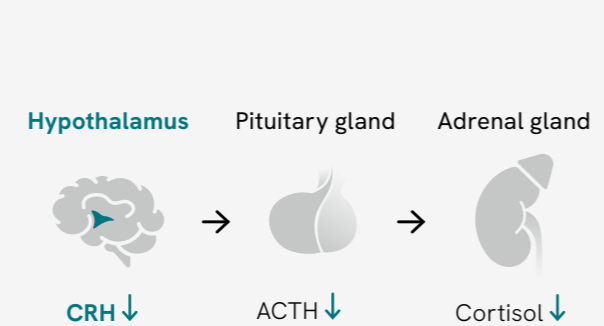
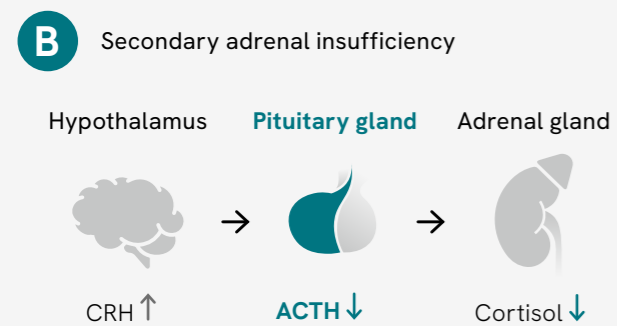
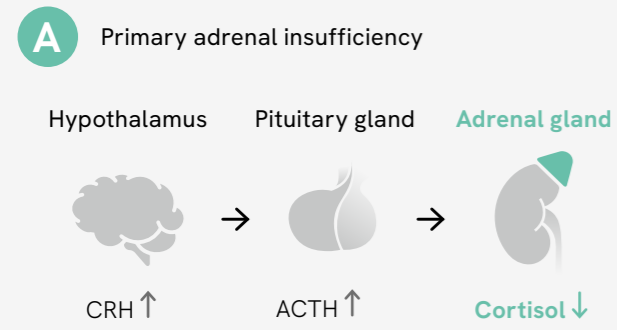
Adrenal insufficiency

is the insufficient production of cortisol by the adrenal gland caused by either impairment of the adrenal gland itself or by dysfunction of the hypothalamic-pituitary-adrenal axis.

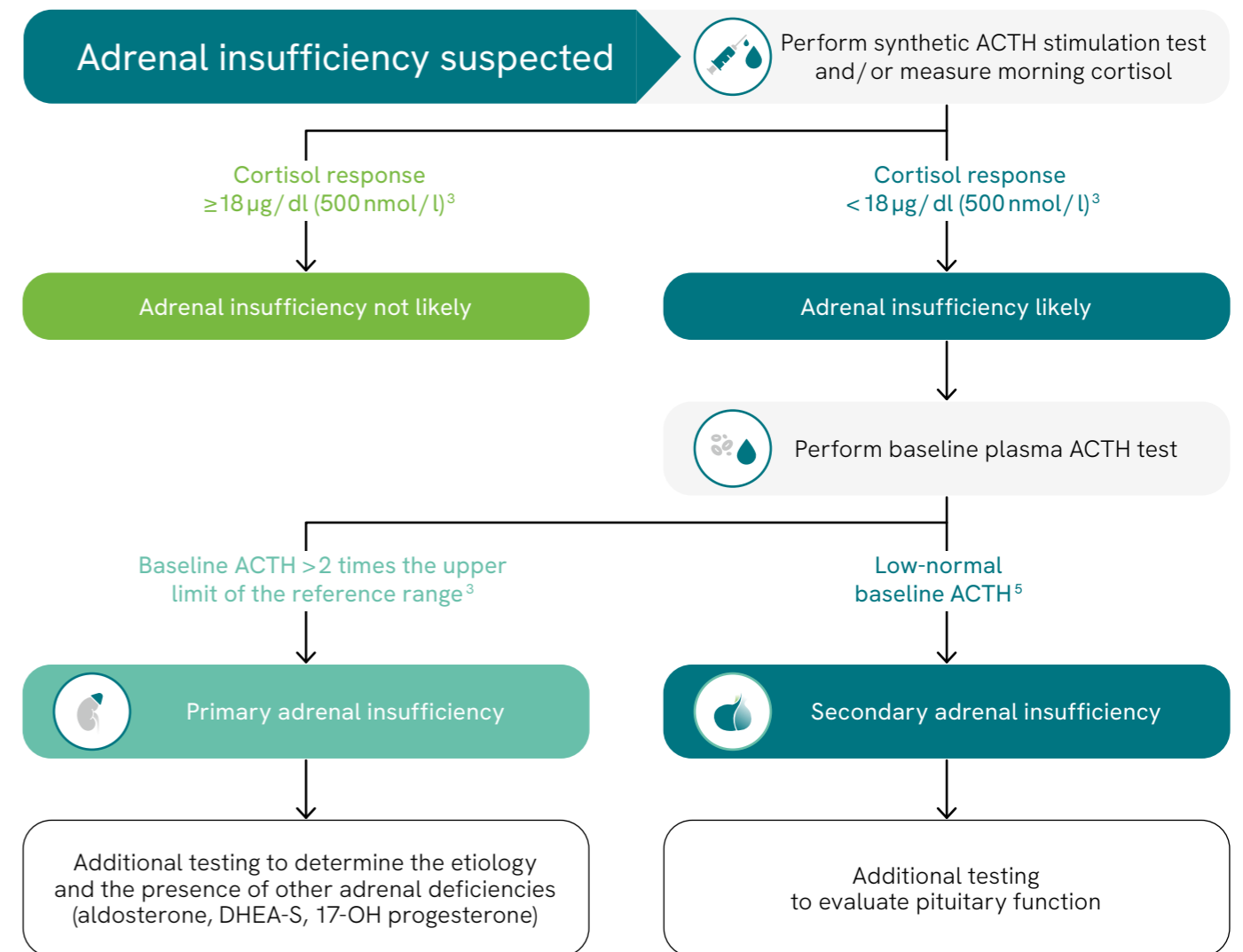
Possible signs and symptoms:

- Fatigue and lethargy
- Weight loss
- Low mood or irritability
- Muscle weakness

Subtype differentiation:



Testing algorithm (adapted from the Endocrine Society guidelines³)



Cascade testing algorithms on page 5 and 7 provided for information purposes only. Testing and diagnosis decisions should be made by a clinician.

Assay information



Efficient laboratory workflow

Consolidation of the testing of key hormones involved in disorders of the hypothalamic-pituitary-adrenal axis (cortisol, ACTH, aldosterone* and renin*) on one fully automated platform from a single plasma sample tube



Traceability

IDS Cortisol: Traceable to the JCTLM-listed LC-MS/MS Candidate Reference Measurement Procedure (cRMP)⁶ for reliable patient results

IDS ACTH II: Traceable to a commercially available automated ACTH electrochemiluminescence immunoassay



Precise measurements

Excellent functional sensitivity and precision over the clinically relevant range



No biotin interference in the IDS Cortisol, Urinary Cortisol and ACTH II assays

Use of the direct antibody coating immunoassay principle to remove the risk of inaccurate results due to biotin interference

*The IDS Aldosterone and Direct Renin assays are included in the IDS Endocrine Hypertension panel.

ChLIA kits**

Product	Product code	Sample type	Sample volume	Assay range
IDS Cortisol	IS-4600	Serum or plasma	30 µl	0.59–45.00 µg/dl
IDS Salivary Cortisol	IS-4900	Saliva	200 µl	0.02–3.0 µg/dl
IDS Urinary Cortisol	IS-5800	Urine	30 µl	0.36–52.0 µg/dl
IDS ACTH II	IS-4500NG	Plasma	150 µl	4–1000 pg/ml

Calibrator and control sets**

Product	Product code	Product format	In-use stability
IDS Cortisol Calibrator Set	IS-4620	6 levels, 1 vial of 1 ml each	28 days
IDS Cortisol Control Set	IS-4630	2 levels, 3 vials of 1 ml each	28 days
IDS Salivary Cortisol Control Set	IS-4930	3 levels, 4 vials of 2 ml each	27 days
IDS Urinary Cortisol Calibrator Set	IS-5820	6 levels, 1 vial of 1 ml each	4 weeks
IDS Urinary Cortisol Control Set	IS-5830	2 levels, 3 vials of 1 ml each	4 weeks
IDS ACTH II Calibrator Set	IS-4520NG	5 levels, 2 vials of 1 ml each (lyophilised)	2 hours
IDS ACTH II Control Set	IS-4530NG	2 levels, 6 vials of 1 ml each (lyophilised)	8 hours

** Products manufactured by Immunodiagnostic Systems Limited (IDS), available to order from your local contact (availability may be restricted in certain countries).

References

- Lightman SL, et al. Dynamics of ACTH and Cortisol Secretion and Implications for Disease. *Endocr Rev* 41(3):bnaa002 (2020).
- Nieman LK, et al. The diagnosis of Cushing's syndrome: an Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* 93(5):1526–40 (2008).
- Bornstein SR, et al. Diagnosis and Treatment of Primary Adrenal Insufficiency: An Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab* 101(2):364–89 (2016).
- Griminger, P. Cortisol in saliva in the diagnosis of Cushing's syndrome: Diagnostic performance of a new automated chemiluminescence immunoassay and the impact of age, sex and BMI. (Poster). ENDO 2016, Boston, USA (2016).
- Bancos I, et al. Diagnosis and management of adrenal insufficiency. *Lancet Diabetes Endocrinol* 3(3):216–26 (2015).
- Hawley JM, et al. Candidate Reference Measurement Procedure for the Quantification of Total Serum Cortisol with LC-MS/MS. *Clin Chem* 62(1):262–9 (2016).

IDS's premium ChLIAs and ELISAs, together with its advanced random-access solutions, have been strengthening Euroimmun's product portfolio since 2021.

#bettertogether



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