

Androstenedione	
Description	<p>Androstenedione is a 19-carbon steroid hormone produced in the adrenal glands and the gonads as an intermediate step in the biochemical pathway that produces the androgen testosterone and the oestrogens oestrone and oestradiol. Adrenal production of androstenedione is governed by ACTH, whereas gonadal production is under the control of pituitary gonadotropins.</p> <p>Androstenedione can be synthesised in two ways: (1) via the action of the enzyme 17, 20 lyase on dehydroepiandrosterone (DHEA), (2) via the action of the enzyme 3-β-hydroxysteroid dehydrogenase on 17-hydroxyprogesterone (which is itself synthesised via the action of 17, 20 lyase). Androstenedione is further converted to either testosterone or oestrogen. Conversion of androstenedione to testosterone requires the enzyme 17β-hydroxysteroid dehydrogenase, while conversion of androstenedione to oestrogens (e.g. oestrone and oestradiol) requires the enzyme aromatase.</p> <p>In females, androstenedione is released into the blood by theca cells. The function of this is to provide androstenedione substrate for oestrogen production in granulosa cells, since these cells lack 17, 20 lyase required for androstenedione. Similarly, theca cells lack the enzyme aromatase required to make oestrogens themselves. Thus, theca cells and granulosa cells work together to form oestrogen. In premenopausal women, the adrenal glands and ovaries each produce about half of the total androstenedione (about 3 mg/day). After menopause, androstenedione production is approximately halved, primarily due to a reduction in ovarian secretion. Nevertheless, androstenedione is the principal steroid produced by the postmenopausal ovary.</p>
Indication	Differential diagnosis of female hyperandrogenism (e.g. hirsutism and virilisation), diagnosis and monitoring of congenital adrenal hyperplasia (CAH), investigation of premature adrenarche.
Additional Info	Mild interference with haemolysis, lipaemia and icterus.
Concurrent Tests	As part of the polycystic ovary syndrome (PCOS) screening tests or together with other androgenic precursors e.g. DHEA.
Dietary Requirements	None.
Interpretation	Elevated androstenedione levels indicate increased adrenal or gonadal androgen production. Increased levels are found with polycystic ovarian syndrome, virilising adrenal tumours (e.g. of the adrenals or gonads) and congenital adrenal hyperplasia.
Collection Conditions	Serum or plasma sample.
Frequency of testing	Minimum retesting interval in female androgen excess – 1 year.