

Congenital Adrenal Hyperplasia

Autosomal recessive defects in enzymes that are responsible for the production of cortisol → Low levels of cortisol → lack of negative feedback to the pituitary → ↑ ACTH → adrenal hyperplasia and increased synthesis of adrenal precursor steroids

	21β-hydroxylase	11β-hydroxylase	17α-hydroxylase	
	95% of CAH	5% of CAH	Rare	
Biochemistry	It converts : <ul style="list-style-type: none"> Progesterone to 11-deoxycorticosterone (DOC) 17-hydroxyprogesterone to 11-deoxycortisol 	It converts : <ul style="list-style-type: none"> 11-deoxycorticosterone to Corticosterone 11-deoxycortisol to Cortisol 	It converts : <ul style="list-style-type: none"> 17-hydroxyprogesterone to Androstenedione 	
	• Cortisol	Decreased	Decreased	
	• Aldosterone	Decreased	Decreased	
	• 11- DOC	Decreased	Increased	
	• Androgens	<div style="text-align: center; color: blue; font-weight: bold;">Increased</div> ↓ Female & male precocious puberty		<div style="text-align: center; color: red; font-weight: bold;">Decreased</div> ↓ Female (1ry amenorrhea) & male Delayed puberty
	Male	<ul style="list-style-type: none"> Normal external genitalia at birth 		<ul style="list-style-type: none"> female external genitalia with intraabdominal testes at birth
Female	<ul style="list-style-type: none"> Male external genitalia along with a uterus and ovaries Virilization, irregular menstrual cycles, infertility 		<ul style="list-style-type: none"> Normal external genitalia 	
Blood pressure	Hypotension	Hypertension		
	Because of salt-wasting associated with hypoaldosteronism and hypocortisolism	It occurs despite hypoaldosteronism because DOC possesses mineralocorticoid (aldosterone-like) activity.		
Diagnostics	<div style="background-color: green; color: black; padding: 2px;">↑↑ 17-hydroxyprogesterone</div> <div style="background-color: yellow; color: black; padding: 2px;">↓ DOC</div> <div style="background-color: yellow; color: black; padding: 2px;">↓ corticosterone</div>	<div style="background-color: green; color: black; padding: 2px;">↑ 17-hydroxyprogesterone</div> <div style="background-color: yellow; color: black; padding: 2px;">↑↑ DOC</div> <div style="background-color: yellow; color: black; padding: 2px;">↓ corticosterone</div>	<div style="background-color: yellow; color: black; padding: 2px;">↓ 17-hydroxyprogesterone</div> <div style="background-color: green; color: black; padding: 2px;">↑ DOC</div> <div style="background-color: green; color: black; padding: 2px;">↑↑ corticosterone</div>	
	Additional laboratory findings <small>All newborns in the US are screened for CAH by measuring : 17 hydroxyprogesterone</small>	Due to Hypoaldosteronism : <ul style="list-style-type: none"> Hyponatremia Hyperkalemia, Metabolic acidosis 	Although aldosterone levels are decreased, DOC has some level of mineralocorticoid activity → Electrolytes and pH are normal	Due to aldosterone-like activity of DOC : <ul style="list-style-type: none"> Hypernatremia Hypokalemia Metabolic alkalosis
Treatment	1) Lifelong glucocorticoid replacement therapy <ul style="list-style-type: none"> Hydrocortisone in neonates and children Prednisolone or dexamethasone in adolescents and adults 			
	+	2) fludrocortisone therapy 2) Spironolactone to block mineralocorticoid receptors 3) Reduce dietary sodium intake		

Types of 21B-CAH	Classic form	Non-Classic CAH
Severity	Severe	Mild
Onset of symptoms	Early onset (during neonatal period or early infancy)	Late onset (presents during late childhood/adulthood)
Clinical manifestations	A) Salt-wasting type : <ul style="list-style-type: none"> ~ 67% of all classic forms Males present 7–14 days after birth with failure to thrive, dehydration, vomiting, and shock Females present with ambiguous genitalia B) Non-salt-wasting type (simple virilizing) : <ul style="list-style-type: none"> ~ 33% of all classic forms No signs of shock Males present with precocious puberty at 2–4 y Females present with ambiguous genitalia 	<ul style="list-style-type: none"> Normal external genitalia at birth in both genotypes Precocious puberty Acne Infertility Females may also have irregular menstrual cycles