

# The Short Child

## BACKGROUND

- Short stature refers to a child 2 or more standard deviations below the mean height for children of the same sex and chronological age
- Majority of cases are due to familial short stature or constitutional delay in growth and puberty (CDGP)

## PHASES OF GROWTH

- First year
  - ✓ Dependent upon nutrition
  - ✓ Average growth 25cm
- Childhood
  - ✓ Dependent on growth hormone
  - ✓ Average growth 5-7cm per year
- Puberty
  - ✓ Pubertal hormones responsible for pubertal growth spurt
  - ✓ Girls 8-10 years of age, boys 9-14 years of age
  - ✓ Average growth 9-10cm per year

## DIFFERENTIAL DIAGNOSIS

- Familial and CDGP (95%)
- Genetic
  - ✓ Turner syndrome
  - ✓ Russell Silver syndrome
- Chronic disease
  - ✓ Coeliac disease
  - ✓ Crohn's disease
  - ✓ Chronic renal failure
- Endocrine
  - ✓ GH deficiency
  - ✓ Hypothyroidism
  - ✓ Cushing syndrome
- Psychosocial deprivation

## EARLY PUBERTY ISSUES

- Early breast development with normal growth and no signs of puberty
  - ✓ U/S to exclude ovarian cyst

## HISTORY

- Birth history/birth weight
- Nutrition
- Past medical history
- Medications esp. steroids
- Parental heights
- Family history of short stature or pubertal delay
- Detailed systems review

## EXAMINATION

- Accurate height
  - ✓ Standing height using stadiometer
  - ✓ Supine length if <18 months
- Weight
- Head circumference
- Tanner puberty stage
- Dysmorphic features or short limbs
- Visual acuity & visual fields
- Measure parental heights and calculate mid-parental height

## INVESTIGATIONS

- Assess growth velocity (should be 5cm per year)
- X-ray left wrist for bone age

## TREATMENT

- Reassurance and annual follow up if familial or CDGP
- Referral if short stature and low growth velocity

## TAKE HOME MESSAGES

- Measurements must be plotted on appropriate centile chart
- Accurate measurement of standing height is key
- Need to calculate growth velocity
- Watch out for Turner's syndrome in short girls

## REFERRAL

- Early puberty
  - ✓ Before 8 years in girls and 9 years in boys
- Delayed puberty
  - ✓ No signs of puberty in a 13 year old girl or a 14 year old boy
- Significant short stature with low growth velocity
- Dysmorphic features or small for gestational age with no growth spurt at 2 years

## MID-PARENTAL HEIGHT

- For a boy: (Father's height + Mother's height + 12.5) / 2
- For a girl: (Mother's height + Father's height - 12.5) / 2
- Child's height should fall within 8.5 cm of this centile line

## GROWTH VELOCITY

- Calculated over 12 month period
- Requires at least 2 measurements
  - ✓  $\frac{\text{Height 2} - \text{height 1}}{\text{Interval (years)}}$

## SPECIALIST

### INVESTIGATIONS

- GH stimulation test
- IGF-1
- T4/TSH
- LH/FSH ± karyotype in females
- Coeliac screen

## RESOURCES

- Centile charts available from: [hse.ie/growthmonitoring](http://hse.ie/growthmonitoring)

## REFERENCES

- *Archiv Dis Child* 2012; 97(1): 9-16