

## Exercise and Sport Science (EXSC187) Lecture notes

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Growth and Motor development and life span.

Week 2 lecture.

GROWTH SPURT	<ul style="list-style-type: none"><li>• Age of peak height velocity → most common measure of somatic maturity</li><li>• Increase in velocity → growth spurt; age at takeoff</li><li>• Measure PHV/yr (peak height velocity)</li><li>• Girls have earlier take off and earlier PHV</li></ul>
HUMAN GROWTH HORMONE	<ul style="list-style-type: none"><li>• 191 single amino acid chain- globular protein</li><li>• GH synthesis is increased by <b>GHRH</b> from hypothalamus (has 44 amino acids)</li><li>• GHIH – somatostatin inhibits release of GH</li><li>• Drop in glucose or free fatty acids stimulate increase GH</li><li>• Protein ingestion stimulates GH release</li><li>• Nocturnal surge in GH release after 1-2 hours deep sleep</li><li>• Exercise is a potent stimulus</li><li>• Flows through blood stream → receptor → picks up high concentration in blood</li></ul>
GH in adolescence	<ul style="list-style-type: none"><li>• Secrete more GH during puberty</li><li>• When estradiol and testosterone ^<ul style="list-style-type: none"><li>• 600 micro grams GH in children</li><li>• 1800 micro grams in late puberty</li></ul></li><li>• 300 – 500 micro grams in adults, drops after 60</li><li>• GH is pulsatile<ul style="list-style-type: none"><li>• Boys pulse GH every 4 hrs</li><li>• Men 1-2 pulses at midnight.</li></ul></li></ul>
Indirect GH actions	<ul style="list-style-type: none"><li>• GH releases IGF-1 from the liver</li><li>• IGF-1 effect on increasing cartilage, bone, muscle &amp; adipose tissue.</li><li>• IGF-1 rise is due to increase of GH</li><li>• Very tall individuals have more GH as they are very responsive to GHRH</li><li>• Special feature of GH is linear growth, by acting on the growth centers.</li></ul>
GH opposes insulin actions	<ul style="list-style-type: none"><li>• Glucose uptake by muscle and adipose tissue is inhibited &amp; glucose levels rise in blood</li><li>• Enhances lipolysis, reducing fat, increase FFA's in blood</li><li>• Diabetogenic hormone</li><li>• Extra GH can lead to diabetes.</li></ul>

