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1: [Horm Res.](#) 2000;53 Suppl 3:37-41.

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Growth hormone - hormone replacement for the somatopause?

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Twenty-four-hour growth hormone (GH) secretion reaches a peak at around puberty and by the age of 21 has begun to decrease. Thereafter the fall in GH secretion is progressive such that by the age of 60 most adults have total 24-hour secretion rates indistinguishable from those of hypopituitary patients with organic lesions in the pituitary gland. Patterns of GH secretion are similar to those in younger people but GH pulses are markedly reduced in amplitude. Sleep and exercise remain the major stimuli for GH secretion. The fall in GH secretion seen with ageing coincides with changes in body composition and lipid metabolism that are similar to those seen in adults with GH deficiency. In elderly subjects, although GH secretion is markedly reduced, remaining GH secretion correlates closely with body composition (particularly with lean body mass and inversely with central abdominal fat). Pioneering studies carried out by Rudman showed that GH administration to elderly subjects with low insulin-like growth factor-I levels resulted in reversal of many of the changes associated with GH deficiency, namely an increase in lean body mass and bone mineral density and a reduction in body fat and plasma cholesterol. These changes were remarkably similar to those shown a year earlier in adults with GH deficiency given GH replacement. Subsequent studies of GH replacement in elderly adults have confirmed Rudman's initial observations but have been dominated by side effects which have led to a high number of dropouts. It is now clear that the elderly are very sensitive to GH and the doses used need to be very low, increased very slowly and tailored to the individual needs of each patient. Using this more cautious approach, recent studies have been very positive. A series of papers from Blackman's group, presented at the US endocrine meeting in San Diego in 1999, investigated the effects of GH with or without testosterone supplements (in men) and oestrogen supplements (in women). Their results showed positive effects of GH on lean body mass, central fat, low-density lipoprotein cholesterol and aerobic capacity. In many instances there was a positive interaction between GH and hormone replacement with testosterone and oestrogen, but it appeared that GH showed the most potent anabolic effects. Clearly more studies are needed before GH replacement for the elderly becomes established. Safety issues will require close scrutiny, but the data available so far are sufficiently positive to undertake large multicentre, placebo-controlled trials, particularly looking at endpoints associated with prevention of frailty and loss of independence.

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