

measured by stroke work, ejection fraction, fractional shortening and mean velocity of circumferential fiber shortening, was decreased in MGX but was slightly increased in MGX + T. Papillary muscle studies showed increases in time to peak tension and one-half relaxation in MGX, but these were decreased in MGX + T. Isotonic shortening studies showed decreased velocity of shortening in MGX and increased velocity in MGX + T. Heart function was significantly decreased in FGX and FGX + P compared with FSH but was similar to FSH in FGX + E and FGX + EP. FGX + T had greater stroke work and ejection fraction than FSH and FGX. Parallel changes of a lesser degree and significance was observed for velocity of circumferential fiber shortening. Gonadectomy in M and F was associated with decreased both in myosin ATPase activity and the percent of V<sub>1</sub> myosin isoenzymes, and these were prevented in males by replacement with testosterone and in females by replacement with estrogen or testosterone. The results indicate important influences of sex hormones on cardiac mass, function, and biochemistry.

**Studies on EDTA extracts and collagenase digests from osteoporotic cancellous bone of the femoral head**

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Using EDTA extraction and collagenase digestion, cancellous bone of the femoral heads from 10 normal and 9 osteoporotic subjects were analyzed for their contents of collagen, sialoprotein, proteoglycan and carbohydrate. The percentage of extracted matrix proteins of the osteoporotic bone in EDTA was significantly decreased, as was the collagenase-resistant fraction ( $p < 0.05$ ). The sialic acid level in osteoporotic bone matrix was lower than in controls ( $p < 0.05$ ). The alterations found in bone matrix constituents in osteoporotic bone relative to controls suggest that in osteoporosis and fractures, not only bone mass changes, but also bone quality changes play a role in bone strength.

**Time-course of alterations of high density lipoproteins (HDL) during thyroxine administration to hypothyroid women**

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Serum HDL cholesterol, apolipoproteins AI and AII and post heparin lipolytic activities (PHLA) have been measured in a group of fourteen hypothyroid women without ovarian oestrogen secretion before and during a 2-month thyroxine treatment. The more rapid and consistent observed event was a decrease in apo AI levels ( $164 \pm 5$  vs.  $149 \pm 5$  mg dl<sup>-1</sup>, mean  $\pm$  SEM,  $P < 0.05$ ) correlated ( $r = 0.79$ ,  $P < 0.05$ ) to a slight increment of PHLA. A slight decrease in apo AII concentration was seen only after 5 days ( $25 \pm 2$  vs.  $22 \pm 2$  mg dl<sup>-1</sup>,  $P < 0.05$ ) and in HDL cholesterol only after 60 days ( $1.3 \pm 0.6$  vs.  $1.1 \pm 0.5$  mmol l<sup>-1</sup>,  $P < 0.05$ ). Apo AI, HDL2 and HDL3 cholesterol were measured in another group of seven hypothyroid postmenopausal women before and after a 2-month thyroxine treatment. We observed a decrease in HDL2 cholesterol ( $1.69 \pm 0.20$  vs.  $1.17 \pm 0.09$  mmol l<sup>-1</sup>,  $P < 0.02$ ) with no changes in HDL3 cholesterol ( $0.88 \pm 0.09$  vs.  $0.99 \pm 0.06$  mmol l<sup>-1</sup>, NS). The decrease in HDL2 cholesterol correlated ( $r = 0.72$ ,  $P = 0.05$ ) with that for apo AI. The differential influence of thyroxine (T<sub>4</sub>) administration on the major HDL components might reflect changes in HDL composition due to the multiple effects of thyroid hormones on lipid metabolism. It can be hypothesized that the decrease in apo AI and HDL2 cholesterol concentrations are due, at least in part, to the increase in hepatic lipase activity.