Design of a Carbon Injector for a Medical Accelerator Complex, U. RATZINGER, B. SCHLITT, GSI, Darmstadt - A design study of a 6 MeV/u 12C4+ injector for a synchrotron for heavy-ion tumor therapy is presented. The injector consists of an ECR source, a LEBT line, a 216 MHz RFQ structure of about 1.2 m length for acceleration from 6 keV/u to 300 keV/u and a subsequent 216 MHz IH drift tube linac of about 3.5 m length for acceleration to 6 MeV/u. The synchrotron should be filled with about 10e9 carbon 6+ ions at injection energy (after passing a thin stripper foil). Assuming a single turn injection scheme, the linac pulse length should be approximately 1.8 microseconds and an electrical current of about 0.5 mA would be required from the ion source. The designed IH-DTL consists of 54 gaps with a maximum gap voltage of about 0.5 MV. The gaps are arranged in four separated drift tube sections, each of them consisting of a short re-bunching unit, a zero degree section for effective acceleration and a subsequent quadrupole triplet for transverse focusing. This Combined Zero Degree Structure was designed using the LORASR computer code. The design of the machine and the construction of a 1:2 scaled rf model for the drift tube linac are presented.