One major problem in using beta sources for endovascular irradiations to prevent restenoses is centering the sources in the arteries. To avoid problems resulting from dose inhomogeneities, sources of tubular form were designed (inner/outer diameter 1 and 2mm; lengths 3 or 5mm). They are fixed on balloon catheters and brought into position with the same guide wire as used for stretching the vessel before. Y-90 or Ho-166 hollow cylinders are completely cladded by an 0.1 mm thick Al-layer. These sealed sources are leak-tested according to ISO-standards. "Beta-emissivity" of the sources is determined by a beta plastic-scintillator calibrated to dose by TLD measurements before sterilization and transport.

Absolute dosimetry was performed by TLDs (1*1mm²; 40mg/cm²; BICRON) calibrated at a reference source of the Physikalisch-Technische-Bundesanstalt, FRG. A fixed correlation between plastic-scintillator detector count rate ("beta-emissivity") and absolute dose 1 and 2mm from the surface at the central plane was established by which treatment time to obtain the required dose will be determined. Additional quality assurance is performed by cross checking the calculated nominal source strength (determined by the activation history) and by routine control of the scintillator detector with a standard Sr-90 source.

Relative dosimetry was performed by TLDs (depth-dose) and GAFCHROMIC-films (depth-dose, dose distribution). Results were compared with Monte-Carlo-calculations (MCNP4; ORNL) and agree within < 10% (absolute dose).

Treatments can be performed at angiographic units without significant adaptations. Irradiations with Y-90 are planned to start in spring '98 at the IRO.