**University of Washington Clinical Neutron Therapy System: Brief History**

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In ’78-‘79 the National Cancer Institute (NCI) awarded contracts to 4 institutions to construct, develop, and operate state of the art Fast Neutron Therapy facilities: UW, Fox-Chase Cancer Center (PA), M.D. Anderson (TX), and UCLA. The UW facility was built by Scanditronix (Sweden) while the Anderson and UCLA facilities were built by The Cyclotron Corporation (TCC) (US). The Fox-Chase facility was built around an existing D-T generator with the beam delivery system being farmed out to several subcontractors and consultants, one of which was TCC. Of these four facilities, the UW Fast Neutron Therapy program is the only one still in existence.

The Clinical Neutron Therapy System was built inside the UW Medical Center (UWMC) and at the end of construction and commissioning, ownership and operation was turned over to the UW School of Medicine (UWSOM). The facility is maintained by an in house engineering/physics group of 5.5 FTE. The facility is shut down for maintenance every Monday and runs beam for patient treatment and isotope research Tuesday-Friday. There are no planned maintenance shutdowns beyond the Mondays, and facility downtime has averaged less than 1.5% over the last 20 years. The CNTS facility has been treating with fast neutrons 52 weeks/year since 1984, treating 3000+ patients in total.

Randomized Fast Neutron clinical trials were conducted at the UWMC on a variety of tumor types. The most promising results were for the salivary gland tumors resulting in a 56% local control rate for neutron therapy as opposed to 17% local control for photons (Laramore et al, 1993). While control rates were reasonable for other tumor sites, they were more comparable to that of photons.

Beyond the 50.5 MeV proton beam used to produce the fast neutrons for therapy, the CNTS accelerator is a multi-particle, variable energy machine making it ideal for isotope research. Our current isotope research utilizes our alpha and deuterium beams and is centered on high LET therapeutic (211At) and theranostic isotopes (117mSn, 186Re).