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| **Radiation Safety** |
| **Policy** | This policy provides guidance for RADIATION SAFETY. |
| **Purpose** | Keep radiation exposure to laboratory staff “as low as reasonably achievable” (ALARA). |
| **Radioactive sources** | * Blood irradiator instruments
* Radioactive treatment sources – radioactive material placed in the body near tumor cells (brachytherapy) or injected into the bloodstream
* Radioactive patient samples – patients receiving radioactive substances for treatment generally have low levels of radioactivity. Excretion of radioactive substances occurs mainly through urine, saliva and perspiration. Therefore, higher levels of radiation are detected in these samples, the most being urine and blood.

The Nuclear Regulatory Commission (NRC) has determined the risk to be low in these samples. Although, radioactivity may be detected in these samples, the radiation dose is insignificant. |
| **Radiation Safety Practices** | * Distance – Increasing distance from a source of radiation may reduce radiation exposure by several fold; doubling the distance from a radiation source results in just ¼ of the exposure in the same amount of time
	+ Irradiator instrument is located in separate room away from staff
		- Irradiator room has restricted access and is under constant surveillance
	+ Use remote handling devices such as forceps, tongs, and tube racks to minimize direct contact with sources and containers (histology grossing table, autopsy)
* Time – Radiation exposure is directly proportional to exposure time. Reducing time near sources of radiation will minimize radiation exposure
* Shielding – Placing material, such as lead, between a radiation source (blood irradiator) and a person to be protected can reduce radiation exposure significantly.
* Personal Protective Equipment (PPE) – Lab coat; gloves; safety eyewear or goggles if sprays or splashes are likely to occur
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| **Safety Signs** | * All areas or rooms where radioactive materials are being used or stored will have a posted door sign bearing the radiation caution symbol and the words “Caution, Radioactive Materials”
* “Notice to Employees” (NRC Form 3) from the Minnesota Department of Health will be posted in close proximity to the radiation area
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| **Radiation Survey & Monitoring**  | * Irradiators are surveyed semiannually for leakage and external contamination and before and after maintenance.
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| **Radioactive exposure** | 1. Notify the histology pathology assistant or section technical specialist, **and** Children’s radiation safety officer, Dr William Mize (pager: 651-629-3595), if a radioactive exposure occurs.
2. Complete an Employee Incident Report

<http://khan.childrensmn.org/forms/EmployeeIncident/EmployeeIncident.asp> |
| **Supporting Documents** | [TS 17.21 IBL 437C Blood Irradiator Function Verification and Maintenance](http://khan.childrensmn.org/Manuals/Lab/SOP/TS/Equip/202469.pdf)[TS 17.22 JL Shepherd 143 Blood Irradiator Function Verification and Maintenance](http://khan.childrensmn.org/Manuals/Lab/SOP/TS/Equip/202470.pdf)[HI 1.19 Handling of Tissues that may Contain Radioactive Material](http://khan.childrensmn.org/Manuals/Lab/SOP/HIS/CytProc/184555.pdf) |
| **References** | 1. Nuclear Regulatory Commission (NRC). <http://www.nrc.gov/>.
2. Occupational Safety and Health Standards. CFR1910.1096 Ionizing Radiation
3. CLSI. Clinical Laboratory Safety; Approved Guideline – Third Edition. CLSI document

GP17-A3. Clinical and Laboratory Standards Institute, Wayne, PA; 2012. |
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| **Historical Record** | **Version** | **Written/Revised by:** | **Effective Date:** | **Summary of Revisions** |
| 1 | Kerstin Halverson | 07/01/2003 | Initial  |
|  | 2 | Carol Buhl | 10/31/2014 | Reformatted to CMS.Renumbered from SA 4.3.Added ‘Radioactive Sources’ section.Added ‘Radiation Safety Practices section.Added ‘Safety Signs’ section.Added ‘Radiation Survey and Monitoring’ section.Added ‘Radioactive Exposure’ section.Updated TS & HI policy references.Added ‘References’ section. |
|  | 3 | Carol Buhl & Laboratory Safety Committee | 06/28/2017 | Modified language from ‘every 6 months’ to ‘semiannually’ to align with Transfusion Service procedures. |