

Instructions for Use of Radiation Dosimetry at Michigan Medicine

The University of Michigan (U-M) Radiation Safety Service (RSS) assigns radiation monitoring dosimeters (“badges”) to occupationally exposed individuals at Michigan Medicine when required by regulation. Per State and Federal regulations and Michigan Medicine policy, **employees are required to wear dosimetry** when participating in procedures involving radiation-producing machines (or radioactive materials). Michigan Medicine departments are responsible for identifying personnel who are (or will be) occupationally exposed to radiation and therefore require dosimetry and radiation safety training.

Dosimeters don’t protect personnel from radiation, but they help determine if wearers are taking appropriate steps to protect themselves against unnecessary radiation exposure. Dosimetry also enables RSS to identify personnel whose occupational doses exceed administrative dose thresholds and may need assistance maintaining their occupational doses As Low As Reasonably Achievable (ALARA).

Michigan Occupational Safety & Health Administration (MIOSHA) regulations that pertain to dosimetry:

- Dosimetry **must be worn** in controlled areas by each individual occupationally exposed to ionizing radiation from therapeutic or diagnostic x-ray equipment (Rules 333 and 348).
 - “Occupationally exposed” means present in a procedure room (“restricted area”) while the radiation-producing machine (x-ray or fluoroscopy) is operating.
- U-M **must require the use of** assigned dosimetry by individuals who are subject to occupational monitoring (Rule 64).
- Dosimetry **must** be permanently assigned to each occupationally exposed individual, and monitoring **must** be continuous during employment as a radiation worker (Rules 333 and 348).
- Dosimeters used to measure whole body dose are normally worn on the chest or abdomen (Rules 65, 333, and 348). However, because personnel participating in x-ray and fluoroscopy procedures are required by State regulation to wear protective aprons, a second (under-apron) dosimeter may be assigned.
 - Personnel who perform or assist in “fluoroscopic special procedures” (which include cardiac catheterization and other interventional fluoroscopy procedures) may be issued over- and under-apron dosimeters.

Individuals assigned dosimetry as a result of their job duties or participation in radiation procedures **must**:

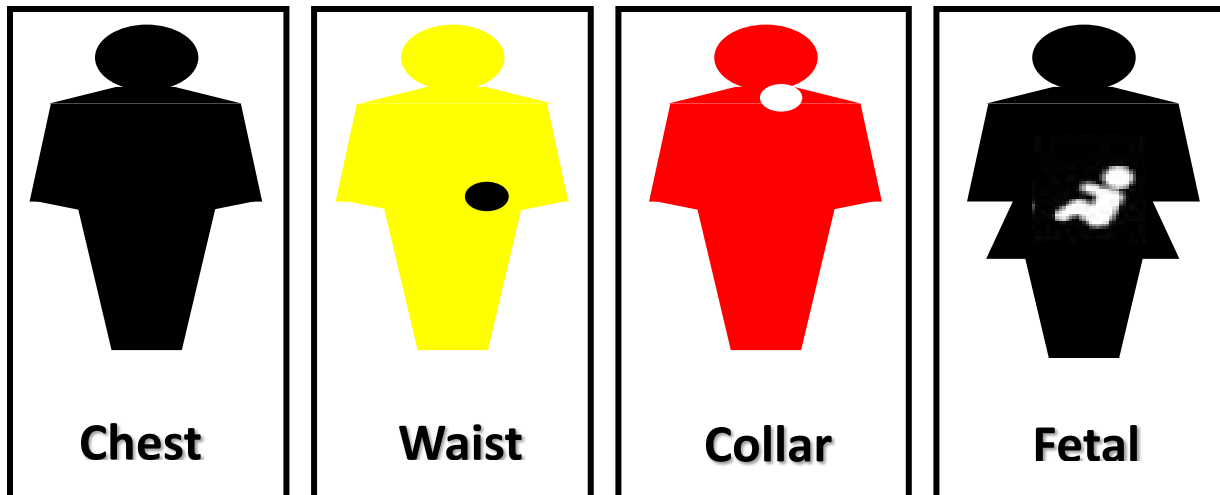
- Wear their assigned dosimetry properly and consistently, and comply with applicable dosimetry policies (U-M and Michigan Medicine)
 - Failure to wear assigned dosimetry is a violation of State law and Michigan Medicine policy, and non-compliance may be subject to disciplinary action
- Return dosimetry promptly at the end of each wear period
 - Wear periods begin on the first day of each month (for monthly wearers) and the first day of January/April/July/October (for quarterly wearers)
 - Your exchange frequency is determined by RSS
- Complete U-M radiation safety training that is appropriate for their job function

Instructions on the proper *wear and care* of dosimetry:

- Wear **all** assigned dosimetry (including ring dosimeters)
- Wear dosimetry with the name label facing the source of radiation (i.e., away from the body)
- Adhere to wear dates printed on dosimeter (i.e., return dosimetry promptly at the end of the wear period).
- **Store** dosimetry properly, in a low-background area and away from radiation sources
 - **Don't** leave dosimetry on a protective apron or thyroid shield in a fluoroscopy room (or near the entrance)
- **Don't** take dosimetry home; leave it at work
 - Dosimetry should stay at or near your Michigan Medicine work location, to avoid being forgotten/lost/damaged or recording non-occupational radiation exposure
- **Don't** leave dosimetry in a hot/humid automobile or similar environment
- **Don't** wear U-M dosimetry while working at other institutions (e.g., VAMC, SJMH), and **don't** wear dosimetry issued by other institutions when working at U-M
- **Don't** wear another individual's dosimetry, and **don't** allow other individuals to wear your dosimetry
- **Don't** wear occupational radiation dosimetry while undergoing a medical/dental procedure or radiation treatment
- **Don't** switch/reverse wear locations
 - **Don't** wear collar (over-apron) dosimeter under apron
 - **Don't** wear waist (under-apron) dosimeter over apron
- **Don't** continue to use a dosimeter that was run through the washer/dryer, damaged, contaminated, or inadvertently exposed
- Report lost dosimetry or dosimetry irregularities to your Dosimetry Contact or RSS
 - Irregularities include (but are not limited to) suspected damage and leaving a dosimeter in a fluoroscopy suite or treatment vault

Instructions on the proper wear *location* for dosimetry:

- Chest (black)
 - Worn between chest and waist
 - For employees who **don't** wear a protective apron
- Collar (over-apron, **red icon**)
 - Worn **over** protective apron (unshielded), on collar of apron or on thyroid shield
 - May be standalone ("single-badge") or worn together with waist dosimeter ("double-badge")
 - Most common dosimeter for Michigan Medicine personnel
- Waist (under-apron, **yellow icon**)
 - Worn **under** protective apron, between waist and chest
 - **Only** worn as a pair with over-apron dosimeter ("double-badge"), never as a standalone
 - Assigned to fluoroscopy users with higher dose potential
 - Common for personnel who perform or assist in "fluoroscopic special procedures" (e.g., cardiac catheterization and other interventional fluoroscopy procedures)
- Fetal
 - Worn **only** by Declared Pregnant Woman (DPW), under protective apron, on abdomen
- Extremity (ring)
 - Worn on hand that receives highest exposure, with white label/chip facing source of radiation



The following U-M information and training resources are available to further assist dosimetry wearers:

- RSS dosimetry information/forms page: <http://ehs.umich.edu/research-clinical-safety/radiation/dosimetry-bioassay/>
- MLearning (<https://trainingportal.med.umich.edu/Saba/Web/Main>):
 - RADI-C10115, Radiation Safety for Health Care Workers (the appropriate mandatory training for personnel who participate in procedures involving radiation-producing machines)
 - RADI-C10260, Radiation Safety for CT Physicians and Staff
 - RADI-C20020, Radiation Safety for Operators of Mini C-arms
 - RADI-C10124, General Radiation Safety
- Annual radiation safety refresher training (via <http://ehs.umich.edu/education/ehs-training-login/>)
- RSS dosimetry and protective apparel poster: http://ehs.umich.edu/wp-content/uploads/2016/08/Dosimeter_Posters.jpg
- SMS radiation safety education and training resources: <http://www.med.umich.edu/i/Safety/RadiationSafety/EducationTraining/EducationTrainingResources.shtml>
- RSS is available to provide radiation safety training/retraining to departments/divisions or groups, focusing on safety, awareness, and regulatory requirements.
 - RSS does not provide training on operation of radiation-producing machines; each department is responsible for machine-specific training and credentialing/privileging.
- Dosimetry Contact Instructions and Responsibilities: http://ehs.umich.edu/wp-content/uploads/2016/05/Dosimeter_Contact_Instructions.pdf

References

Michigan Ionizing Radiation Rules Governing the Use of Radiation Machines (Revised 2016), http://www.michigan.gov/lara/0,4601,7-154-11407_35791-385258--,00.html

Dosimetry in Fluoroscopy and Other X-Ray Procedures Requiring the Use of Protective Aprons (HFS-105) (Retired 2016).

Dosimetry in Extremity Fluoroscopy (Mini C-Arms) (MIOSHA-RSS-118) (2016), http://www.michigan.gov/documents/lara/miosha-rss-118_Dosimetry_for_Extremity_Fluoroscopy_Mini_C-Arms_531828_7.pdf

Michigan Medicine Policy 05-03-029, Radiation Monitoring Dosimeter (Revised 2019),
<https://michmed-clinical.policystat.com/policy/6917531/latest/?z=eyJpIjogMH0>

U-M ALARA Program (Revised 2019),
<http://ehs.umich.edu/wp-content/uploads/2020/01/ALARA-Program.pdf>

Revision History

REVISION #	DATE	REVISION #	DATE	REVISION #	DATE
0	February 2012	2	July 2018	4	August 2020
1	August 2015	3	January 2020		