



Your Radiation Dosimeter: A Tutorial

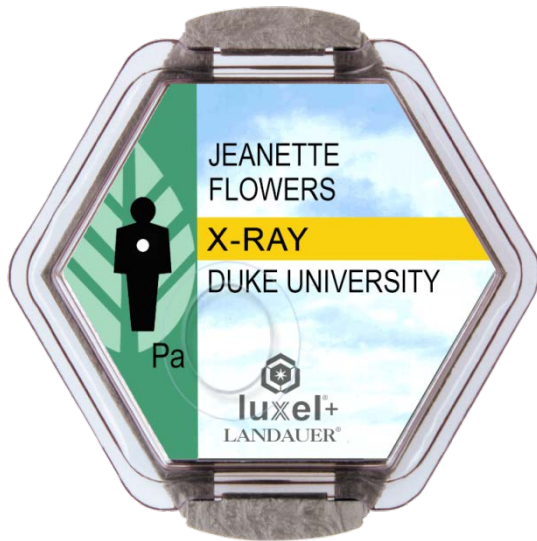
Radiation Safety Division
Duke University Health System

As a Duke Radiation Worker...



...you have an obligation to help us monitor your occupational radiation dose. This tutorial can help you understand how to do that!

Your Radiation Dosimeter ("Film Badge")



Body Badge



Ring Badge

There are many different types of radiation dosimeters, sometimes called “film badges” or “radiation badges”, that we can use to measure your dose. The type of dosimeter you wear will depend upon the type of work you do, and your work environment.

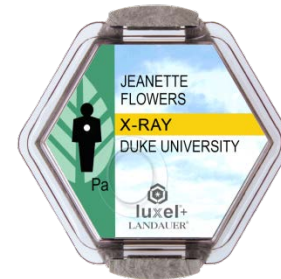
When to Wear Your Radiation Dosimeter

- **You *must* wear your dosimeter ("film badge") whenever you are working with:**
 - x-ray equipment
 - radioactive patients
 - radioactive materials
- **You *must not* wear your dosimeter while having x-rays that are part of your medical or dental care**
 - Radiation exposure from these sources is not included in your occupational exposure

Types of Dosimeters

- **Body Dosimeter:** Depending on your situation, you will wear a body dosimeter at:

- collar level (fluoroscopy, x-ray)
- chest level (nuclear medicine)
- waist level (during pregnancy)



- **Ring Dosimeter:** Ring dosimeters (used for measuring beta and gamma dose to the hand) should be worn:

- on the hand which is closest to the radiation source
- so that the label is on the palmar (inside) surface of the finger, toward the radiation source



Wearing Your Ring Dosimeter



LEFT: Note how the label side of the ring, which contains the dosimeter's active element, is on the *inside* of the hand. This ensures that short-range beta particles, which are a skin hazard, are not blocked by the fingers. **RIGHT:** When wearing gloves, wear the dosimeter on the *inside* of the glove. This ensures that the dosimeter is not lost when the glove is removed and disposed.

“Single-Badging” for Fluoroscopy Users

- You will wear your dosimeter:
 - at the collar level
 - on the *outside* of any x-ray shielding personal protective equipment (lead apron, thyroid shield) you are wearing
- Your assigned dose is calculated by a formula called the "ED-2" formula, which multiplies the badge reading by a factor designed to better reflect your true effective dose



Know Your Radiation Dose!

- **Depending upon the type of work you do, your dosimeter may be changed monthly or quarterly**
- **You should check your *dosimetry report* (see *example* on next slide) to help you minimize your exposure**
- **Your reports are sent to the "badge contact" person in your work area and are available for your inspection**
- **You will be contacted by Radiation Safety if your dose exceeds acceptable levels**

The number in this column gives you the best indication of your overall dose

RADIATION DOSIMETRY REPORT

ACCOUNT NO.	DATE	DOSIMETER RECEIVED	REPORT TIME IN WORK DAYS	PAGE NO.
10108	4/99	04/07/99	5	

Read your "whole body dose" (in millirem) from this column.

Find your name in this column

PARTICIPANT NUMBER	NAME	CATERGORY	RADIATION QUALITY	DOSE EQUIVALENT (MREM) FOR PERIODS SHOWN			QUARTERLY ACCUMULATED DOSE EQUIVALENT (MREM)			YEAR TO DATE DOSE EQUIVALENT (MREM)		
				DEEP DDE	EYE LOE	SHALLOW SDE	DEEP DDE	EYE LOE	SHALLOW SDE	DEEP DDE	EYE LOE	SHALLOW SDE
FOR MONITORING				01/01/99 - 03/31/99			QTR 1			1999		
02771	BRITANN B... L	F	WHBODY	12	13	14	12	13	14	12	13	14
02987	TERRY T	M	WHBODY	20	20	19	20	20	19	20	20	19
03045	KELLY J	M	WHBODY	15	15	15	15	15	15	15	15	15
03557	CAROLYN	F	WHBODY	51	51	53				51	53	
03653	MICHAEL	M	WHBODY	15	15	15				15	15	
03692	VASHEK	M	WHBODY	2	1	1		1	1	2	1	1
03694	BARBARA	F	WHBODY	M	M	M	M	M	M	M	M	M

M = "Minimal" (less than one millirem)

For this group, the doses is the "DEEP/DDE" column range from 1 to 51 millirem. These are low quarterly occupational doses. The natural background radiation is about 75 millirem per quarter.

Dosimeter Do's and Don't's

- ***DO:***
 - Wear your dosimeter correctly
 - Check your reports
 - Let us know if you lose your badge
- ***DON'T:***
 - Wear some one else's badge, or give your badge to some else to wear
 - Wear your badge during your medical x-rays
 - Put your badge in the laundry

Resources

- **Duke Radiation Safety: (919)684-2194**
- **Lost Badge Certificate:**
<http://www.safety.duke.edu/RadSafety/DOCS/lostbdge.pdf>
- **History Release Form:**
<http://www.safety.duke.edu/RadSafety/DOCS/history.pdf>
- **Badge Wearer Policy:**
http://www.safety.duke.edu/RadSafety/badges/docs/badge_wearer_policy.pdf