Bergen
Community College

Division of Science and Health

RADIATION THERAPY PROGRAM

Clinical Manual – Section II

Clinical Forms
Radiation Safety
2007 - 2008

Program Directory

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Table of Contents:

Radiation Therapy Program Clinical Curriculum

1. Pre-Competency Requirements
   A. demonstration of laboratory competency
   B. prior to attempting a competency evaluation, the student must document demonstration of at least two comparable patient set-ups.

2. Competency Requirements:
   A. A clinical competency requires both a psychomotor and cognitive evaluation.
   B. Students are evaluated from the criterion that is indicated on the Clinical Competency Evaluation forms.
   C. Points are awarded based on the supervisor's clinical judgment.

Required Professional Conduct:

Radiotherapy students are required to:

- comply with the policies of the affiliate since students are guests of the Hospital.
- conduct themselves in a professional manner at all times.
- professional ethics:
  - the student may not turn the key to any treatment machine.
  - the student may not study at the treatment or simulator console.
  - the student may not read magazines or newspapers while at the treatment console.
  - the student is to keep the patient chart open until the completion of the patient's treatment.
  - the student shall audibly and visually monitor all patients.
  - the student will turn in all original documentation to clinical supervisors
  - i.e. lab forms, competency evaluation forms, clinical tracking forms, sign in sheets, etc. no copies will be accepted.
- adhere to all Hospital policies.
- never eat, drink and chew gum within the sight of patients.
- never leave patients unattended.
- address faculty, management, staff and patients in a professional manner.
- inform the program of address or phone number changes
- avoid using the department's telephones for personal use- emergencies only
- notify the instructor or designee before leaving the department
- maintain pagers on "pulse" mode

Record Keeping Responsibilities:

- Clinical Supervisors are responsible for accurately recording and maintaining all clinical forms. Students are encouraged to make copies of all forms as they are submitted. All forms will be collected, tallied and secured by the Clinical Coordinator. No copies will be accepted.

- These records will include:
    a. Clinical Competency Evaluation Forms
    b. Clinical Competency Requirement Forms
    e. Clinical Tracking Forms
    f. Attendance Forms

Clinical Competency Forms

1. Clinical Competency Evaluation Forms – Completed by an appointed clinical supervisor and reviewed with the student at the time of completion. The student will meet with the program director at mid-semester and the clinical coordinator at mid and end semester to discuss the cumulative results.

2. Treatment Machine Procedures (pages 5 & 6)– RTT 121
3. Treatment Machine or Low Volume / High Risk Procedure (pages 7 & 8) – RTT 221-222
4. C.T. Simulation Procedure (pages 9 & 10)
5. Fluoro Procedure (pages 11 & 12) – RTT 121 / 221, 222
6. Beam Modification Devices (pages 13 & 14)
7. Dosimetry (pages 15 & 16)
8. General Patient Care (pages 17 & 18)

2. Clinical Competency Requirements Forms (pages 19 - 21) – These forms are in accordance with ARRT requirements for registration examination eligibility. These forms will be given to the student at the beginning of the program and will serve as documentation for the successful completion of all required competencies. The student is responsible for securing the completed forms and bringing them to the mid and end semester evaluation meetings.

3. Clinical Tracking Forms (pages 22 – 24) – The student will track their development from laboratory to demonstration to clinical competency. The purpose of this form is to assure a progressive learning experience from didactic to laboratory to clinical competency.

4. Clinical Rotation Attendance Form (page 25) – This form is given to the student at the beginning of the school year and as needed. On a daily basis, the student is responsible for signing in and out at the time of arrival and departure. On a daily basis, the student is responsible for obtaining verification with an authorized signature. A clinic representative, i.e. radiation therapist, nurse, dosimetrist, physicist, who is present when the student arrives and leaves may sign this form.

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION – RTT 121

TREATMENT MACHINE PROCEDURE

A student is eligible to perform a clinical evaluation after successful completion of a laboratory competency module and 2 (two) clinical demonstrations (assisted or unassisted under direct supervision) on the specific procedure.

Patient _____ Simulated _____ Procedure _____

Student _____ Date_____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
C+	75% to 79.9%	Acceptable / Marginal and Conditional	1
C	70% to 74.9%	Poor / Unsatisfactory and Failing	0

	4	3	2	1	0	N/A
1. Review chart and information system accuracy prior to preparing patient for treatment.	____	____	____	____	____	____
2. Explain physician's orders and dose prescription.	____	____	____	____	____	____
3. Prepare treatment room prior to admitting patient.	____	____	____	____	____	____
4. Describe pathology and stage of disease.	____	____	____	____	____	____
5. Greet / Escort correct patient to / from treatment area.	____	____	____	____	____	____
6. Confirm patient's identity as correct.	____	____	____	____	____	____
7. Assist the patient onto the treatment table using proper body mechanics or adequate lifting assistance.	____	____	____	____	____	____
8. Explain procedure and confirm patient understanding.	____	____	____	____		
9. Position patient to reproduce set-up as indicated in treatment chart.	____	____	____	____	____	____
10. Use the correct positioning and immobilization device	____	____	____	____	____	____

	4	3	2	1	0	N/A
11. Position treatment machine to reproduce set-up as indicated in treatment chart.	____	____	____	____	____	____
12. Apply principles of radiation protection.	____	____	____	____	____	____
13. Use appropriate accessory devices safely and correctly.	____	____	____	____	____	____
14. Select the proper tray, blocks, template, etc., and use them as indicated on treatment chart.	____	____	____	____	____	____
15. Insert correct wedge properly.	____	____	____	____	____	____
16. Recheck set-up with treatment chart before leaving the room.	____	____	____	____	____	____
17. Instruct patient to maintain position during treatment.	____	____	____	____	____	____
18. Set, activate appropriate controls on console.	____	____	____	____	____	____
19. Monitor patient both visually and audibly.	____	____	____	____	____	____
20. Monitor treatment machine console during treatment.	____	____	____	____	____	____
21. Record pertinent data concerning patient status on proper document.	____	____	____	____	____	____
22. Record, add, and initial daily treatment entry and accumulated dose.	____	____	____	____	____	____
23. Capture treatment and port film charges.	____	____	____	____	____	____
24. React effectively in the event of treatment machine malfunction or radiation hazard. Describe the correct procedure to follow in case of malfunction or emergency.	____	____	____	____	____	____
25. All of the above done in a timely manor.	____	____	____	____	____	____

Comments: _____

_____

_____

_____

Designated Clinical Supervisor Signature _____

Print Name _____**Date**_____

Clinical Site _____ **Treatment Unit** _____

Student Signature _____**Date**_____

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION - RTT 221 / RTT 222

PROCEDURE **: TREATMENT MACHINE** ☐ **/ LOW VOLUME - HIGH RISK** ☐

Student _____ Date_____

Successfully completed: Lab. module _____ Two Patient Demonstrations _____

Patient _____ Simulated _____ Procedure _____

Clinical Site _____ Treatment Unit _____

Designated Clinical Supervisor (print name) _____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
C+	75% to 79.9%	Acceptable / Marginal and Conditional	1
C	70% to 74.9%	Poor / Unsatisfactory and Failing	0

	4	**3**	**2**	**1**	**0**	**N/A**
1. Review chart and information system accuracy prior to preparing patient for treatment.	____	____	____	____	____	____
2. Explain physician's orders and dose prescription.	____	____	____	____	____	____
3. Prepare treatment room prior to admitting patient.	____	____	____	____	____	____
4. Correlate pathology, stage of disease and field arrangement	____	____	____	____	____	____
5. Greet patient, confirm patient's identity as correct and escort patient to and from treatment area.	____	____	____	____	____	____
6. Assist the patient onto the treatment table using proper body mechanics or adequate lifting assistance.	____	____	____	____	____	____
7. Explain procedure and confirm patient understanding.	____	____	____	____	____	____
8. Identify patients on treatment protocols and describe any procedures specific to that protocol	____	____	____	____	____	____
9. Position patient to reproduce set-up as indicated in treatment chart.	____	____	____	____	____	____

	4	3	2	1	0	N/A
10. Safe and appropriate use of:						
correct positioning and immobilization devices	____	____	____	____	____	____
accessory devices	____	____	____	____	____	____
tray,, blocks, template, etc.	____	____	____	____	____	____
correct wedge properly inserted.	____	____	____	____	____	____
11. Position treatment machine to reproduce set-up as indicated in treatment chart.	____	____	____	____	____	____
12. Apply principles of radiation protection.	____	____	____	____	____	____
13. Discuss matching borders and gaps when applicable.	____	____	____	____	____	____
14. Demonstrate ability to take, evaluate and document port films	____	____	____	____	____	____
15. Recheck set-up with treatment chart before leaving the room.	____	____	____	____	____	____
16. Instruct patient to maintain position during treatment.	____	____	____	____	____	____
17. Set, activate appropriate controls on console.	____	____	____	____	____	____
18. Monitor patient both visually and audibly.	____	____	____	____	____	____
19. Monitor treatment machine console during treatment.	____	____	____	____	____	____
20. Assess and evaluate patient's physical and emotional status, recognize radiation induced side effects and respond appropriately to changes in the patient's condition.	____	____	____	____	____	____
21. Record, add, and initial daily treatment entry and accumulated dose.	____	____	____	____	____	____
22. Capture treatment and port film charges.	____	____	____	____	____	____
23. React effectively in the event of treatment machine malfunction or radiation hazard. Describe the correct procedure to follow in case of malfunction or emergency.	____	____	____	____	____	____
24. Perform, evaluate and document daily quality assurance procedures. Notify appropriate personnel when warranted	____	____	____	____	____	____
25. All of the above done in a timely manor.	____	____	____	____	____	____

Comments:

Clinical Supervisor Signature **Date**

Student Signature **Date**

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION

PROCEDURE: **C.T. SIMULATION** ☐ **DAILY Q.A.** ☐

A student is eligible to perform a clinical evaluation after successful completion of a laboratory competency module and 2 (two) clinical demonstrations (assisted or unassisted under direct supervision) on the specific procedure.

Patient _____ Simulated _____ Procedure _____

Student _____ Date_____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
C+	75% to 79.9%	Acceptable / Marginal and Conditional	1
C	70% to 74.9%	Poor / Unsatisfactory and Failing	0

		4	**3**	**2**	**1**	**0**	**N/A**
1.	Obtain necessary patient and physician information before the start of the simulation.	____	____	____	____	____	____
2.	Prepare the room prior to the start of the simulation procedure.	____	____	____	____	____	____
3.	Explain physician's orders in relation to patient position, immobilization devices, equipment and contrast media.	____	____	____	____	____	____
4.	Describe pathology and stage of disease.	____	____	____	____	____	____
5.	Turn machine ON/OFF and observe C.T. scanner warm up procedures.	____	____	____	____	____	____
6.	Greet / Escort correct patient to / from simulator.	____	____	____	____	____	____
7.	Explain procedure and confirm patient understanding.	____	____	____	____	____	____
8.	Obtain necessary identification and authorization documentation.	____	____	____	____	____	____
9.	Locate and operate couch movement controls.	____	____	____	____	____	____
10.	Identify and explain proper use of the inside and outside lasers.	____	____	____	____	____	____

		4	3	2	1	0	N/A
11.	Assist the patient onto the C.T .simulation table using proper: body mechanics or adequate lifting assistance.	____	____	____	____	____	____
12.	Position patient using lasers for alignment.	____	____	____	____	____	____
13.	Determine the placement of the pilot scan.	____	____	____	____	____	____
14.	Take the pilot scan and determine where C.T. slices are to be obtained (sim sheet).	____	____	____	____	____	____
15.	Accurately mark patient treatment area.	____	____	____	____	____	____
16.	Transfer C.T, images onto X-ray film.	____	____	____	____	____	____
17.	Inform patient of the importance of reproducibility. Tattoo or Tegaderm marks.	____	____	____	____	____	____
18.	Prepare immobilization device and demonstrate patient immobilization.	____	____	____	____	____	____
19.	Demonstrates radiation protection ALARA principles.	____	____	____	____	____	____
20.	Monitors the patient and demonstrates appropriate patient care.	____	____	____	____	____	____
21.	Accurately label simulation films and film jacket.	____	____	____	____	____	____
22.	Interpret the information on the DRR and worksheet.	____	____	____	____	____	____
23.	Interpret coordinates from the simulation sheet	____	____	____	____	____	____
24.	Record patient position and other required information.	____	____	____	____	____	____

RTT 221 / RTT 222 to be demonstrated once during second and third semester:

25.	Perform daily QC as per protocol of department.	____	____	____	____	____	____
26.	Review and discuss CT scan and treatment plan with clinical supervisor, medical physicist or dosimetrist.	____	____	____	____	____	____

Comments:_____

_____

_____

_____

Designated Clinical Supervisor Signature _____

Print Name _____ **Date**_____

Clinical Site _____ **Simulation Unit** _____

Student Signature _____ **Date** _____

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION – RTT 121 / RTT 221, 222

PROCEDURE: **FLUORO SIMULATION** ☐ **DAILY Q.A.** ☐

A student is eligible to perform a clinical evaluation after successful completion of a laboratory competency module and 2 (two) clinical demonstrations (assisted or unassisted under direct supervision) on the specific procedure.

Patient ____ Simulated ____ Procedure _____

Student _____ Date_____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
C+	75% to 79.9%	Acceptable / Marginal and Conditional	1
C	70% to 74.9%	Poor / Unsatisfactory and Failing	0

	4	**3**	**2**	**1**	**0**	**N/A**
1. Obtain necessary patient and physician information before the start of the simulation.	____	____	____	____	____	____
2. Prepare the room prior to the start of the simulation procedure.	____	____	____	____	____	____
3. Explain physician's orders in relation to patient position, immobilization devices, equipment and contrast media.	____	____	____	____	____	____
4. Describe pathology and stage of disease.	____	____	____	____	____	____
5. Greet / Escort correct patient to / from simulator.	____	____	____	____	____	____
6. Explain procedure and confirm patient understanding.	____	____	____	____	____	____
7. Obtain necessary identification and authorization documentation.	____	____	____	____	____	____
8. Assist the patient onto the simulation table using proper body mechanics or adequate lifting assistance.	____	____	____	____	____	____
9. Position patient appropriately for simulation procedure.	____	____	____	____	____	____
10. Prepare immobilization device and demonstrate patient immobilization.	____	____	____	____	____	____

	4	3	2	1	0	N/A
11. Position the fluoro simulator to produce the set-up as requested by the radiation oncologist.	____	____	____	____	____	____
12. Call the radiation oncologist to start the fluoroscopic simulation.	____	____	____	____	____	____
13. Demonstrates radiation protection ALARA principles.	____	____	____	____	____	____
14. Monitors the patient and demonstrates appropriate patient care.	____	____	____	____	____	____
15. Sets appropriate radiographic technique and obtain appropriate films.	____	____	____	____	____	____
16. Demonstrate appropriate film processing technique.	____	____	____	____	____	____
17. Accurately label simulation films and film jacket.	____	____	____	____	____	____
18. Accurately mark patient for treatment.	____	____	____	____	____	____
19. Obtain contour and record all measurements and set-up instructions.	____	____	____	____	____	____
20. Record machine set-up parameters.	____	____	____	____	____	____
21. Photograph treatment marks and patient in treatment position.	____	____	____	____	____	____
22. Inform patient of the importance of reproducibility. Tattoo or Tegaderm marks.	____	____	____	____	____	____
23. Differentiate between SSD and SAD technique.	____	____	____	____	____	____
24. Draw and label diagram of the treatment field in the chart.	____	____	____	____	____	____

RTT 221 / RTT 222 to be demonstrated once during second and third semester

25. Estimate equivalent square.	____	____	____	____	____	____
26. Determine magnification factor from radiograph	____	____	____	____	____	____
27. Determine field size or TFD from radiograph	____	____	____	____	____	____
28. Perform simulator QA as per protocol of department	____	____	____	____	____	____

Comments: _____

_____

_____

Designated Clinical Supervisor Signature _____

Print Name _____ **Date** _____

Clinical Site _____ **Simulation Unit** _____

Student Signature _____ **Date** _____

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION

BEAM MODIFICATION DEVICES

A student is eligible to perform a clinical evaluation after successful completion of a laboratory competency module and 2 (two) clinical demonstrations (assisted or unassisted under direct supervision) on the specific procedure.

Patient _____ Simulated _____

Student _____
Date_____

Procedure:

Photon Block Fabrication _____
Electron Block Fabrication _____
Bolus Fabrication _____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
C+	75% to 79.9%	Acceptable / Marginal and Conditional	1
C	70% to 74.9%	Poor / Unsatisfactory and Failing	0

	4	**3**	**2**	**1**	**0**	**N/A**
1. Accurately select correct patient and simulation films	____	____	____	____	____	____
2. Accurately select correct TFD / SFD.	____	____	____	____	____	____
3. Accurately select correct orientation for the block to be cut.	____	____	____	____	____	____
4. Accurately mark the correct location of the handle on the Styrofoam.	____	____	____	____	____	____
5. Accurately verify the blocked field using the field light coincidence.	____	____	____	____	____	____
6. Correctly label the Styrofoam.	____	____	____	____	____	____
7. Employ safety and hazardous waste precautions.	____	____	____	____	____	____

	4	3	2	1	0	N/A
8. Accurately mount cerrobend blocks to Lucite tray.	____	____	____	____	____	____
9. Accurately label the completed block(s).	____	____	____	____	____	____
10. Differentiate between a positive and negative block.	____	____	____	____	____	____
11. Accurately fabricate an electron cut-out.	____	____	____	____	____	____
12. Accurately label an electron cut-out.	____	____	____	____	____	____
13. Demonstrate custom bolus fabrication.	____	____	____	____	____	____

Comments:

Designated Clinical Supervisor Signature _____

Print Name _____ **Date**_____

Clinical Site _____

Student Signature _____ **Date** _____

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION

DOSIMETRY

Patient _____ Simulated _____ __

Student _____Date_____

Procedure _____

Clinical Site _____ Tx. Planning System _____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
C+	75% to 79.9%	Acceptable / Marginal and Conditional	1
C	70% to 74.9%	Poor / Unsatisfactory and Failing	0

		4	**3**	**2**	**1**	**0**	**N/A**
1.	Interpret dose prescription.	____	____	____	____	____	____
2.	Accurately perform point calculations on the computer.	____	____	____	____	____	____
3.	Correlate components of the treatment chart with the simulator films and worksheets.	____	____	____	____	____	____
4.	Calculate the blocked equivalent square.	____	____	____	____	____	____
5.	Explain tissue compensators.	____	____	____	____	____	____
6.	Create a treatment plan and calculations for a single, open field.	____	____	____	____	____	____
7.	Create a treatment plan for parallel opposed fields with blocks.	____	____	____	____	____	____
8.	Create a treatment plan for a wedged field or tangents.	____	____	____	____	____	____
9.	Create a treatment plan for an electron field.	____	____	____	____	____	____

		4	3	2	1	0	N/A
10.	Create a computer generated isodose plan.	____	____	____	____	____	____
11.	Accurately calculate given dose.	____	____	____	____	____	____
12.	Accurately calculate % depth dose.	____	____	____	____	____	____
13.	Accurately calculate monitor units / time.	____	____	____	____	____	____
14.	Accurately calculate geometric gap.	____	____	____	____	____	____
15.	Accurately calculate weighted fields and evaluate for optimum dose distribution.	____	____	____	____	____	____
16.	Perform SSD, SAD, and extended distance SSD calculations.	____	____	____	____	____	____
17.	Define treatment volume, target volume, tumor volume and critical structures.	____	____	____	____	____	____
18.	Explain tumor lethal dose and normal tissue tolerance dose.	____	____	____	____	____	____
19.	Design, compare and contrast treatment plans.	____	____	____	____	____	____

Comments:

_____

_____

_____

_____

_____

Designated Clinical Supervisor / Representative Signature _____

Print Name _____ **Date** _____

Student Signature_____ **Date** _____

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY TECHNOLOGY PROGRAM

CLINICAL COMPETENCY EVALUATION

GENERAL PATIENT CARE

A student is eligible to perform a clinical evaluation after successful completion of a laboratory competency module and 2 (two) clinical demonstrations (assisted or unassisted under direct supervision) on the specific procedure.

Patient ____ Simulated ____

Procedure:

Vital Signs (Blood Pressure, Pulse, Respiration, Temperature) _____

CPR Verification _____

Oxygen Administration _____

Patient Transfer _____

Student _____Date_____

Please check the appropriate performance based on the student's demonstrated ability. A minimum of a Good / Competent rating must be achieved in each task in order to successfully complete the evaluation. Comment on any rating below 2.

Letter Grade	Numerical Range	Conversion	Numerical Grade Equivalent
A	90% to 100%	Excellent / Distinguished	4
B+	85% to 89.9%	Very Good / Above Average	3
B	80% to 84.9%	Good / Competent – Average for Level of Training	2
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Vital Signs	**4**	**3**	**2**	**1**	**0**	**N/A**
1. Accurately perform vital signs (blood pressure, pulse, respiration and temperature)	____	____	____	____	____	____
2. Accurately document vital signs.	____	____	____	____	____	____
3. Identify the equipment needed to take pulse, blood pressure and respiration.	____	____	____	____	____	____

	4	3	2	1	0	N/A
CPR						
4. Properly perform CPR	____	____	____	____	____	____
5. Present current CPR card	Expiration Date _____					
Oxygen Administration						
6. Explain apparatus for O2 administration.	____	____	____	____	____	____
7. Set the O2 dose in accordance with the prescription.	____	____	____	____	____	____
8. Demonstrate O2 administration	____	____	____	____	____	____
Patient Transfer						
9. Safely and effectively transfer patient from stretcher to table.	____	____	____	____	____	____
10. Safely and effectively transfer patient from wheel chair to table.	____	____	____	____	____	____

Comments:

_____

_____

_____

_____

Designated Clinical Supervisor Signature _____

Print Name _____ **Date** _____

Clinical Site _____

Student Signature_____ **Date** _____

Bergen Community College
Radiation Therapy Technology Program

RADIATION THERAPY CLINICAL COMPETENCY REQUIREMENTS

RADIATION TREATMENT PROCEDURES

Candidates must demonstrate competence in the 20 procedures identified below. Fifteen of the treatment procedures must be demonstrated on patients; five procedures may be demonstrated under simulated conditions if demonstration on patients is not feasible. Demonstration of competence does not require actual delivery of dose.

BRAIN	Date Completed	Patient or Simulated	Verified By
Primary			
Metastatic			
HEAD AND NECK			
Laterals Only			
3 Field – Laterals and Supraclavicular			
CHEST			
AP/PA			
Obliques			
BREAST			
Tangentials			
Supraclavicular			
Posterior Axilla			
ABDOMEN			
AP/PA			
3 or More Fields			
Para-Aortic			
PELVIS			
AP/PA			
Multiple Field Supine			
Multiple Field Prone			
Inguinal			
SKELETAL			
Spine			
Extremity			
ELECTRON FIELDS			
Single			
Abutting Fields			

Bergen Community College
Radiation Therapy Technology Program

RADIATION THERAPY CLINICAL COMPETENCY REQUIREMENTS

SIMULATION PROCEDURES **Competency may be demonstrated on a conventional simulator, CT simulator or treatment machine. All simulation procedures must be demonstrated on patients**			
	Date Completed	Patient	Verified By
Brain			
Head and Neck			
Chest			
Breast			
Abdomen			
Pelvis			
Skeletal			
DOSIMETRY **Calculations should be performed for actual patients; however, calculations may be completed for simulated patients if demonstration on actual patients is not feasible** **Perform calculations for each of the following:**			
Single, Open Field			
Parallel Opposed Fields with Blocks			
Geometric Gap			
Weighted Fields			
Wedged Fields			
Computer Generated Isodose Plan			
Electron Field			
BEAM MODIFICATION DEVICES **Competency is demonstrated by fabricating the following:**			
Custom Blocks (Photon)			
Custom Blocks (Electron)			
Bolus			

Bergen Community College
Radiation Therapy Technology Program

RADIATION THERAPY CLINICAL COMPETENCY REQUIREMENTS

GENERAL PATIENT CARE **The activities should be performed on patients; however, simulation is acceptable if state or institutional regulations prohibit candidate from performing the procedure on patients.** **Competency is demonstrated by performing:**			
CPR			
Vital Signs (BP, pulse, respiration, temperature)			
O2 Administration			
Patient Transfer			

LOW VOLUME / HIGH RISK PROCEDURES **Competence may be demonstrated under simulated conditions if necessary. Demonstration of competence does not require actual delivery of treatment dose.** **Competence is demonstrated by performing the following:**			
Total Body Irradiation (TBI)			
Craniospinal			
BRACHYTHERAPY – Observation strongly recommended.			
Semester - _____			

Bergen Community College - Radiation Therapy Training Program

CLINICAL TRACKING FORM

Radiation Treatment Procedures

NAME_____

EXAMINATION	Lab Module	Demonstration Date # 1	Demonstration Date # 2	Competency Evaluation Pass / Fail *	Supervisor / Date

*A failing grade requires the student to complete two additional demonstrations before each additional competency attempt.

Bergen Community College - Radiation Therapy Training Program

CLINICAL TRACKING FORM

Simulation Procedures

NAME_____

EXAMINATION	Lab Module	Demonstration Date # 1	Demonstration Date # 2	Competency Evaluation Pass / Fail *	Supervisor / Date

*A failing grade requires the student to complete two additional demonstrations before each additional competency attempt.

Bergen Community College - Radiation Therapy Training Program

CLINICAL TRACKING FORM

Beam Modification Devices / Patient Care

NAME_____

EXAMINATION	Lab Module	Demonstration Date # 1	Demonstration Date # 2	Competency Evaluation Pass / Fail *	Supervisor / Date

*A failing grade requires the student to complete two additional demonstrations before each additional competency attempt.

Bergen Community College - Radiation Therapy Training Program
CLINICAL ROTATION ATTENDANCE FORM 2006 – 2007

NAME_____

Date	IN	OUT	Clinical Representative	Date	IN	OUT	Clinical Representative

DIRECT SUPERVISION POLICY

All students and clinical staff are required to adhere to Bergen Community College policy and JRCERT standards requiring all radiation therapy procedures be performed under the Direct Supervision of a qualified practitioner. The Direct Supervision at all times policy will be strictly enforced by college and clinical staff and adhered to by students. The monitoring of such a policy will be overseen by the clinical supervisor and clinical affiliate instructor. Direct Supervision is as follows:

Clinical Supervision

All radiation therapy students must be under DIRECT CLINICAL SUPERVISION of a registered radiation therapist regardless of their level of competency of the student. The following are the prescribed parameters for direct clinical supervision:

A qualified radiation therapist reviews the procedure in relation to the student's achievement.

A qualified radiation therapist evaluates the condition of the patient in relation to the student's knowledge.

A qualified radiation therapist is present during the conduct of the procedure

A qualified radiation therapist reviews and approves the procedure

BERGEN COMMUNITY COLLEGE
RADIATION THERAPY PROGRAM

RADIATION SAFETY

HOSPITAL AND DEPARTMENT SAFETY PROCEDURES

An orientation of the hospital clinical site and radiation therapy department will provide students with information regarding the location and use of safety equipment including fire extinguishers, exit doors, stairways, and power source circuit breakers. Notify your supervisor when you suspect an emergency situation.

If a student is injured while on the premises of the clinical site, it is the responsibility of the student to immediately report the injury to a clinical supervisor and to the supervisor of the department in which the accident occurred. An incident report form is to be completed by the student and the supervisor at this time. If your condition requires medical attention, the supervisor will send you to the Emergency Room.

Emergency Procedures

IN CASE OF FIRE:

R – Rescue (Get people out of danger)
A – Alarm (Pull alarm)
C – Confine (Close doors)
E – Extinguish (If possible)

STEPS FOR BLOOD/ BODY FLUID EXPOSURE:

1. Wash Wound Immediately
2. Advise Supervisor
3. Fill out Incident Report
4. Report to Emergency Department

EMERGENCY CODES:

Amber – Child Abduction
Blue – Adult Emergency
Gray – Security Needed
Orange – HAZMAT
Red – Fire
Clear – Situation Cleared
Silver – Hostage / Gun
Triage – Disaster
White – Pediatric Emergency
Yellow – Bomb Threat
10 – Medical Emergency
777 – Evacuation

Emergency Telephone Extensions

Emergency telephone extensions should be posted by the telephone(s) in each clinical area of the radiation therapy department.
The telephone number of the Radiation Therapy Program Director at Bergen Community College is: 201-493-5034

INFECTION CONTROL / STANDARD PRECAUTIONS

HAND WASHING

Wash hands after touching blood, body fluids, secretions, or excretions.
Wash hands immediately after gloves are removed.
Wash hands between patients.
Wash hands between tasks on the same patient.
Use a plain (nonantimicrobial) soap for routine hand washing.
Use an antimicrobial agent or a waterless antiseptic when directed by infection control.

GLOVES

Clean, nonsterile gloves are adequate for most procedures.
Wear gloves when touching blood, body fluids, secretions, excretions and any contaminated items.
Put on clean gloves just before touching mucous membranes or nonintact skin.
Change gloves between tasks and procedures on the same patient.
Remove gloves promptly and before touching noncontaminated items, equipment, and environmental surfaces and then immediately wash hands.

MASK, EYE PROTECTION, AND FACE SHIELD

Wear these devices to protect mucous membranes of your eyes, nose, and mouth during procedures likely to generate splashes or sprays of blood, body fluids, secretions or excretions.

GOWN

A clean, nonsterile gown is adequate for most purposes.
Wear a gown to protect your skin and to prevent soiling your clothing where splashes or sprays are likely.
Select a gown that is appropriate for the amount of fluid likely to be encountered (cloth vs. plastic).
Remove a soiled gown promptly.

PATIENT-CARE EQUIPMENT

Handle used equipment in a careful manner to prevent transfer of infection.
Properly discard single-use items.
Ensure that reusable equipment is not used again until it has been reprocessed.

ENVIRONMENTAL CONTROL

This pertains to routine care, cleaning and disinfection of environmental surfaces such as treatment couches, treatment equipment, and other frequently touched surfaces.

LINEN

Handle, transport, and process used linen soiled with blood, body fluids, secretions, or excretions in a careful manner so as not to spread pathogens.

OCCUPATIONAL HEALTH AND BLOODBORNE PATHOGENS

Take care to prevent injuries when using needles, scalpels, and other sharp or heavy instrument devices.
Never recap a used needle, do not manipulate them using both hands, or use any technique that involves directing the point of the needle toward any part of the body.
Do use either a one-handed technique or a mechanical device designed for holding the needle sheath.
Do not remove used needles from disposable syringes by hand and do not bend, break, or otherwise manipulate used needles by hand.
Do place used needles, syringes, and other sharps into puncture-resistant containers, which should be located as close as possible to the area in which such items are used.
Use mouthpieces, resuscitation bags, or other ventilation devices as an alternative to mouth-to-mouth resuscitation methods.

PATIENT PLACEMENT

Place a patient who contaminates the environment or who does not (or cannot be expected to) assist in maintaining appropriate hygiene or environmental control in a private room or controlled environment.

DISEASES REQUIRING TRANSMISSION-BASED PRECAUTIONS

AIRBORNE PRECAUTIONS	DROPLET PRCAUTIONS	CONTACT PRECAUTIONS
Measles Varicella (including Zoster) Tuberculosis	Diphtheria Pertussis Pneumonic plague Mumps Rubella Influenza	Multi-drug-resistant bacteria (G.I., respiratory, skin, wound infections) Enteric infections (E-coli, shigella, hepatitis A) Highly contagious skin infections (herpes simplex, impetigo, scabies, zoster) Viral hemorrhagic infection (Ebola, Lassa, and Marburg)

ORIENTATION TO RADIATION SAFETY

A.L.A.R.A. (AS LOW AS REASONABLY ACHIEVABLE)

The Radiation Therapy Program abides by the A.L.A.R.A. principles of radiation safety.

Occupational Radiation Monitoring Devices – Film Badges

Purpose of monitoring of radiation dose received by individual radiation workers:

1. It allows the worker to know how much radiation he or she is receiving.
2. It allows the facility safety officer and administration to determine if certain areas or workers are receiving more radiation than expected.
3. It provides a permanent record of radiation received if questions arise at a later time.

Exposure Limits

The Nuclear Regulatory Commission (NRC) and the State of New Jersey require individuals it be monitored if an individual's radiation exposure is expected to exceed ten percent of the annual limits. The annual limit for an adult radiation worker is 5 rem or 5000 mrem in a year. The annual limit to any organ other than the lens of the eye is 50 rem. The skin and extremities have an annual dose equivalent limit of 50rem. The lens of the eye has an annual dose limit of 15 rem.

Pregnancy

If a female radiation therapy student becomes pregnant, she may voluntarily declare her pregnancy. This is done by notifying the program director in writing of the pregnancy and the estimated date of conception. A private consultation with the radiation safety officer is scheduled to discuss the risks of using ionizing radiation while pregnant and to review exposure history information. All declared pregnancy information is kept confidential.

The choice whether to declare your pregnancy is completely voluntary. If you choose not to declare your pregnancy, you and your embryo/fetus will continue to be subject to the same radiation limits that apply to occupational workers.

Dose to the embryo/fetus during the entire pregnancy, due to occupational exposure of the declared pregnant worker, must not exceed 0.5 rem (500 mrem or 5 mSv). Once a pregnancy becomes known, exposure of the embryo-fetus shall be no greater than 0.05 rem (50 mrem or 0.5 mSv) in any month (excluding medical exposure).
These limits can only be enforced if the pregnancy is declared. Following declaration of pregnancy, a second dosimeter will be offered to be worn at the waist / gonadal area. This dosimeter will be used to provide an estimate of the dose to the embryo/fetus.

The Radiation Therapy Program abides by the NRC regulations regarding the declared pregnant student (worker) and fetal exposure. In the event of a declared pregnancy, the

program director will place the pregnant student in a work area having a low probability of personal exposure, if this is administratively possible without unduly disrupting clinical rotation schedules or achievement of clinical objectives. The other alternative is for the student to take a leave of absence and return after the birth to start at the beginning of the term where she left. Credit will be given for all completed courses and clinical rotations. The Program Director and Radiation Safety Officer will assist the declared pregnant woman with making an informed decision by providing information regarding the risks of radiation exposure in the radiation oncology department.

Storage

Radiation badges will be issued on the first day of the program. The radiation badge does not provide protection from radiation; its sole purpose is to measure the amount of radiation to which it is exposed. Radiation badges must be worn at all times during clinical school hours. The student must notify the program director immediately if the badge is lost or forgotten. The student will be given a spare badge until a replacement is obtained. When not in use, badges should be kept in a location in the department free from radiation. Do not take the badges home or leave it in a car. Do not wear it when you are receiving medical tests or treatments, including dental examinations.

Wear your radiation badge between your neck and waste with the clip side of the badge toward your body and fastened so it remains vertical. Wear only the radiation badge with your name on it. The badge is changed quarterly. Return the previous badge promptly each quarter when your new badge is issued.

Accidental Exposure

Emergency – Off Procedures

Only the patient is allowed in the treatment room, when the machine is on. In the event that another person is accidentally left in the room or there is a malfunction in the treatment machine, emergency push buttons are located at several points within the room and on the machine itself. They remove all power to the unit when pressed. Circuit breakers, located outside of the treatment room remove all power to the treatment room area, including the treatment machine.

The machine will not be energized when the buttons are released unless the therapist proceeds through the normal start procedures at the control panel.

Safety devices and emergency–off buttons must be tested frequently and in accordance with manufactures and regulatory agency recommendations.

Reporting and Documenting an Emergency

Notify the Clinical Supervisor and Program Director if you suspect an overexposure or have been inadvertently exposed. The Radiation Safety Officer of the college and the Radiation Safety Officer of the clinical site will be notified. Notify the program director if the badge is accidentally contaminated, exposed to excessive heat or is exposed during a radiation oncology procedure. Radiation safety will be notified and a replacement badge may need to be furnished. An incident report form may be needed for documentation.

All badges are sent out for processing and upon receipt of the badge results, the Radiation Therapy Program Coordinator performs a review to ensure results are within acceptable limits and/ or determine if any investigations are required. Following this review, a copy of any questionable results is forwarded to the Radiation Therapy Radiation Safety Officer for review. The results are maintained permanently by the Radiation Therapy Program.

The lowest reading for a whole badge is 10 mrem, results less than this are reported as 0 for minimal. At 125 mrem/quarter (ALARA level 1) and 375 mrem/quarter (ALARA level 2) results are considered investigational and will be reviewed in accordance with state regulations. At greater than 1250 mrem/quarter, notification of the NJDH and the NRC may be required in addition to an investigation and review.

Radiation Safety Concepts

A.L.A.R.A. – To keep exposure to ionizing radiation **A**s **L**ow **A**s **R**easonably **A**chievable.

Lowering radiation received lowers any risk of adverse effects.

Measures should be taken, whenever possible, to reduce individual exposure well below regulatory limits.

The three basic ways of keeping radiation exposure low are:

TIME – Amount of time of exposure to radiation
DISTANCE - The distance from the radiation source
SHIELDING – Shielding oneself from the source.

Procedures must be used to ensure that patients undergoing radiation treatment Receive only that dose prescribed by the Radiation Oncologist and a minimum exposure elsewhere.

Although the radiation exposure from a simulator is small compared to a therapeutic dose, it is still good practice to minimize the exposure from unnecessary x-rays. Ensure that the correct factors are used and that the film processor is operating correctly.

Time

The less time one is exposed to radiation, the less dose is acquired. In a radiation therapy department, there is little opportunity to use this method of radiation protection since all personnel are outside the linear accelerator treatment room when the therapy machine is on. The time spent near brachytherapy patients should be minimized since they emit radiation after the sources have been implanted.
In a simulation procedure, fluoroscopy exposure should be kept to a minimum.

Distance

This method only applies to brachytherapy patients and cobalt-60 units since all personnel is outside the linear accelerator treatment room during operation. When exposed to a radioactive source, the inverse square law applies: doubling the distance from the source reduces the exposure to one fourth its original level.

Shielding

Shielding is the most important method for protection of operators and members of the general public in the radiation therapy department.
In a radiotherapy simulator procedure, the collimator must be set as small as possible so as to avoid irradiating larger fields than necessary.
External beam therapy units produce radiation beams of high energy and the shielding that is required is greater than conventional X-Ray units.
The choice of shielding material depends on the energy of the beam. Where lead is primarily used for superficial units, iron, concrete, steel and lead are used at higher energies where Compton interactions dominate. Since these materials attenuate radiation equally, the choice is usually based on economic and space factors. For new construction, concrete is usually the material of choice because of its low cost.
Factors that influence radiation shielding:

(W) Workload of the machine and patients treated per week.
(U) Primary beam use factor – The amount of time that the beam is aimed at the floor, ceiling or a particular wall.
(T) Time that the area adjacent to the treatment room will be occupied.
(D) Distance from the source of radiation to the occupied area.
(P) Dose limit for the occupied area.

Radioactivity

The role of regulatory agencies is to license users of radioactive materials and radiation-producing equipment, inspect such users and enforce the appropriate laws. One of the leading federal regulatory agencies in the U.S. is the NRC (Nuclear Regulatory Commission), which oversees the use of isotopes produced in nuclear reactors. In the radiation therapy department, these sources are used for both teletherapy and brachytherapy sources.. The use of machines that produce ionizing radiation, such as linear accelerators, fall under the jurisdiction of the Food and Drug Administration (FDA) and state agencies.

The NRC and state regulators have additional regulations designed to protect both the operator of the equipment and the patient:

Warning Signs – Entrance doors to the therapy rooms must be posted with a sign that says: "CAUTION, HIGH RADIATION AREA" because the radiation levels can exceed 1mSv (100 rems) in 1 hour. When radiation levels may exceed 5gy (500cGy) in 1 hour the sign should read "GRAVE DANGER, VERY HIGH RADIATION AREA". This is not typically seen in a medical facility.

Warning Lights – Beam on indicators are required on the control panel at the entrance door and on the treatment unit itself. These lights should be illuminated whenever the therapy unit is on.

Door Interlocks - Entrance doors to therapy rooms must be equipped with an interlock that will shut off the machine if the door is opened during treatment. The machine will not produce radiation when the door is closed unless the operator deliberately turns it on.

Visual and Auditory Communication – It is necessary for the radiation therapist to be able to see and hear the patient throughout the treatment. This is accomplished with television monitors and an intercom system located at the control consol area outside of the treatment room.

"Beam On" Monitors – High energy therapy units are required to have an independent beam-on monitor in the room to alert the therapist if he/she enters the room when the beam is on.

Brachytherapy – Sources for implants are always emitting radiation. A license from either the NRC or the state is required to receive, possess and use such sources. Sources are stored in a heavily shielded safe in an area secure from theft or loss.

Written Directives and Inventories – Before the implant is prepared, a written directive must be completed by the requesting physician and a careful inventory must be maintained.

Transportation – Sources must be transported in shielded carriers.

Patient Rooms – The patient is placed in a private room. Care must be taken so that the patient's bed is placed so as not to expose the patient in the adjoining room.

Training Personnel – Instruction in radiation safety; Nurses should wear personnel monitors.

Warning Signs and Surveys – The entrance door to the patient's room must be posted with a caution sign. Visiting periods should be limited to 20 minutes per visitor per day. Visitors should keep a safe distance from the patient as established by the Radiation Safety Officer. Radiation warning signs are to be placed on patient's wrist, bed and chart. After removal of the implant, a survey needs to be done.

Leak Test – Brachytherapy sources must be leak tested in intervals not to exceed 6 months.
Low Dose Rate Brachytherapy – Requires the patient to be hospitalized 24 to 72 hours.

High Dose Rate Brachytherapy – Greater radiation activity decreases the treatment time. These are done on an outpatient basis, and, since they are computer controlled, there is less exposure to the preparer. The sources, Iridium 192 and Cesium 137 cannot be handled manually. Potential problems include error or loss of control of the source.

Pregnant Patient

The Radiation Oncologist will inform the patient of the risks of radiation treatment during pregnancy. The radiation therapist will deliver the radiation dose in accordance with the prescription and safety requirements established by the Radiation Oncologist, Radiation Safety Officer and physics staff.

Environmental Protection

Toxic or Hazardous Materials

Metals (Mold Room Shielding Alloy) – Every mold room contains at least three main areas: a hot-wire foam cutter, an alloy melter and a casting plate and block breakout/detailing area.
Mold Room Safety Tips:

- Wear protective clothing
- Wear gloves
- Wear a respirator when filing blocks
- Wear eye protection.
- Leave all of the above protection devices in the mold room
- Check alloy melter temperature daily
    - The primary area of concern is the alloy melting unit and the potential for releasing cadmium and/or lead oxide fumes into the room's atmosphere. The determining factor in the release of metallic oxide fumes is temperature. The higher the temperature, the greater the potential for release of these fumes and an increased chance of personal injury from burns.
- The recommended pouring temperature of alloy is:
    - Low melting 158F / 175 – 185F pouring temperature (alloy of choice)

Medium melting 203F / 220 – 225F pouring temperature
Skim and collect alloy sludge for periodic recycling
Minimize spills and splashes
Minimize vigorous filing and sanding of blocks
Always use a vacuum for cleanups to prevent the dust from becoming airborne – avoid sweeping. A HEPA vacuum should be used. A tacky surface mat, placed at the door of the mold room, collects hazardous dust from shoes to prevent its spread outside of the mold room.
Do not eat, drink or smoke in the mold room
Wash face, hands and arms when work is completed
Confirm working engineering controls.
With the mold room door closed, it is recommended that the air in the mold room be exchanges 5 to 6 times per hour through the building's heating and air conditioning system.
A sign indicating hazardous materials area – authorized personnel only should be posted on the mold room door
Confirm the implication of safety procedures

Chemicals (Film Processing) – X-Ray film processing chemical pose no direct hazard to the radiation therapist. All records of disposal or recycling of film processing fixer solutions containing silver and lead foil backing on x-ray film must be kept on site for three years.

Radioactive Materials – Some materials that give off radiation are also used for diagnosis and treatment. These materials are used in Nuclear Medicine and Radiation Oncology. Unlike x-ray machines that produce radiation when turned on, radioactive materials are always giving off radiation and, therefore, must be kept in a lead lined container when not in use. Some examples of radioactive materials that are used in medicine are: Cesium, Iodine, Thallium and Strontium.
Radiation Limits:

Radiation Workers	-	5 rem/yr
Non-Radiation Workers	-	0.5 rem/yr
General Public	-	0.1 rem/yr

Radioactive Drugs – Upon injection into the patient, certain radioactive pharmaceuticals settle into certain body organs. A gamma camera in Nuclear Medicine senses the radiation in the organ, allowing it to be recorded on film. The uptake of the radioactive pharmaceutical may indicate pathology and provide the doctor with information for a diagnosis. Some tests that use radiation in this way are bone scans and heart scans. Thyroid disease may be treated using a type of radioactive pharmaceutical.

Sealed Sources – Some sealed sources of radition may be put into a body cavity as a treatment. Examples of this are cesium implants, which is used for some gynecological (female) cancers, and iodine "seeds" for treating prostate cancer in men.

Chemotherapy – Antineoplastic agents derive their name from their ability to halt new growth. They are also known as cytoxic agents. Despite their use in cancer therapy, several agents are known human carcinogens. Other antineoplastic agents are teratogenic (cause fetal mutation/malformation).
Chemotherapy is not administered in the radiation oncology department, but it is not unusual for a patient to arrive for a radiation treatment procedure while receiving chemotherapy. If a leak or spill should be discovered while the patient is in the radiation therapy department, notify your clinical supervisor immediately. Do not attempt to clean the spill or come in contact with the chemotherapy agent in any way. To prevent further contamination, do not remove the leaky source or patient from the area. Environmental services will be contacted for proper clean-up and disposal. If contact with the agent has already occurred, wash the area immediately with soap and water if possible. Report the incident to your clinical supervisor and the program director. Follow the directions of the clinical supervisor and the protocol of the clinical site. An incident report may be warranted.

Handling and Disposal

Brachytherapy patients – In general there is radioactive contamination problems with brachytherapy patients, and therefore the only hazards arise from the radiation emitted by the sources and the potential hazard of sources becoming displaced from the tissue. Removal will be carried out by a member of the Radiation Oncology Department who will advise staff of any special precautions at the time of removal.

Patients with permanent implants will only be permitted to leave the hospital once the activity of the radioisotope has decreased to a level which is internationally recognized as safe.

Accidental contamination procedures

There are three major causes of spillage of liquid radioactive material:

1. Spillage from a source container
2. Leakage from an injection procedure
3. From patient excretion such as urine, faeces, sweat, saliva and vomitus

Any spill has a level of danger and all accidents involving radioavtive material will be reported to the clinical site Radiation Safety Officer as well as the program director. In cases where personal injury is involved, such as a scratch on the skin where radioactive material may enter the person's body, an incident report form must be completed.

The following procedure should be followed on discovery of a radioactive material contamination problem:

All persons involved in the incident are to vacate the immediate vicinity but are not to move freely around the department, as this involves a danger of spreading contamination.

IMMEDIATELY notify the clinical supervisor and the Radiation Safety Officer.

If the contamination is due to a container spill of liquid and the hands are protected with gloves, right the container, and ensure that it is adequately shielded. If the problem is

due to a leaky syringe or other container, place suspect item in a plastic bag and remove it to the Hot Lab, if possible.

Follow the directions of the Radiation Safety Officer and the protocol of the clinical site.

Material Safety Data Sheets and the Right to Know Policy

The New Jersey Worker and Community Right to Know Act requires public and private employers to provide information about hazardous substances at their workplace. A copy of the Hazardous Substance Fact Sheets and Material Safety Data Sheets are located in the Radiation Therapy Department at each clinical site.

Information on Radiation Monitoring Badges

A film badge is a device used to measure the radiation exposure that a person receives during clinical hours. It is to be worn at every clinical site.

Film badges are distributed quarterly and are to be exchanged for the previous quarter's badge immediately upon receipt. The old badges must be returned to this college clinical supervisor immediately in order to avoid further exposure.

Radiation badges must be worn at all times that a student is on the clinical site premises. They must not be left in such areas as simulation rooms, treatment rooms, console areas, or in areas immediately adjacent to the walls of the above rooms.

Film badges are to be worn at lapel level with the side which is open on the badge holder forward. Badges are not to be worn inside pockets or under the lapel so that the side or back of the holder is exposed to radiation. If ever a lead apron is worn , the badge is to be worn outside the apron to estimate maximum exposure.

Any individual who is concerned about exposure to other organs , may request the assistance of the Radiation Therapy Program Director in determining if additional monitoring is necessary.

If exposure to hands or fingers is of concern, please notify the Radiation Therapy Program Director to determine if a ring badge will be supplied.

In case the radiation badge is damaged or exposed accidentally to radiation not received by the person, the Radiation Therapy Program Director must be notified immediately. This badge must be returned to the Radiation Therapy Program Director. A replacement badge will be issued.

The badge records are maintained in a locked file cabinet in the Radiation Therapy office. Any individual who receives a badge exposure exceeding 375 millirems in any quarter will be notified. The circumstances will be investigated by the program and the RSO of the clinical site and the report of such investigation will be kept on file.

Students will be routinely informed of their most recent exposure readings.

Bergen Community College
Radiation Therapy Program

Radiation Overdose Policy

Appropriate radiation monitors (dosimeters) are provided for all students of the radiation therapy program. Exposure reports are reviewed by the BCC Radiation Safety Officer and the Radiation Therapy Program director. They are maintained in the director's office and all students are routinely informed of their most recent exposure readings. Any incidence of overdose that warrants investigation shall be recorded and maintained on the incidence report form and kept in the program directors office.

In accordance with our ALARA program, the following investigational levels have been established:

A.	Whole Body:	Level I - 125 mrem Level II - 375 mrem
B.	Skin:	Level I - 1250 mrem Level II - 3750 mrem
C.	Extremities:	Level I - 1250 mrem Level II - 3750 mrem
D.	Lens of Eye:	Level I - 375 mrem Level II - 1125 mrem

These levels are based on quarterly reports.

Any exposure above ALARA Level I will be documented verbally.
Any exposure above ALARA Level II will be documented in writing.
Any exposure exceeding these levels will be reported to the NJDEP in compliance with section 7:28-13.2.