CHRISTIANA CARE
HEALTH SYSTEM

Helen F. Graham Cancer Center

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www.christianacare.org

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Patrick A. Grusenmeyer, ScD, FACHE
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Pain Management

Stephen S. Grubbs, MD
Chief, Medical Oncology
Principal Investigator
Community Clinical
Oncology Program

Michael Guarino, MD
Director, Pharmaceutical
Clinical Trials

Christopher Koprowski, MD
Chair, Radiation Oncology

D. Bruce Panasuk, MD
Chief, Thoracic Surgery

June 29, 2006

NMSB1

RECEIVED
REGION 1
2006 JUL -3 AM 10: 36

Randolph C. Ragland, Jr
Senior Health Physicist
NRC Region I
475 Allendale Road
King of Prussia, PA 19426
610-337-5269 fax

Dear Mr. Ragland:

03001303

I request that you amend our NRC Materials License, Number 07-12153-02 by adding Jon Strasser, M.D. as an Authorized Medical User(AMU) under 35.400.

Today's request is a followup to an initial request and followup letter dated July 22, 2005 (NRC Mail Control No. 136985, with Appendices E and F); also we refer back to your email response to Dr. Strasser March 24, 2006.

You asked for proof that Dr. Jay Harris, who was Dr. Strasser's Radiation Oncology program director at the Harvard Medical School, is listed as AMU on an appropriate license. Attachment 1 is documentation from RSO, Frank Castronovo, Jr., Ph.D. demonstrating that Dr. Jay R. Harris is an AMU, licensed by the Commonwealth of Massachusetts, Agreement Broad Scope License #44-0004, Permit #900. Dr. Castronovo states that Lee Chin, D.Sc. is the Director of the Radiation Physics Division of the Radiation Oncology Department and also the Authorized Medical Physicist (AMP) on this Broad Scope License. Dr. Castronovo states that other mentoring radiation oncologists for Dr. Strasser, Drs. Phillip Devlin and Akila Viswanathan, are also AMU's on this Broad Scope License.

You asked for the details of the structured educational program at Harvard, covering the basic physics, mathematics, and biology of radionuclide techniques applicable to those listed in 10 CFR 35.690(b)(1)(i) and ..(ii). Attachment 2 has been provided by their faculty, Drs. Lee Chin(Radiation Physics) and Kathryn Held(Radiation Biology). They document the didactic instruction satisfying 10 CFR 35.690(b)(1)(i) for Dr. Strasser's 4-yr Residency program in Radiation Oncology. Cumulative 4-yr classroom instruction included about 215 hours of Radiation Physics and its associated Math as well

139062

NMSS/RGN1 MATERIALS-002

as an additional 80 hours of Radiation Biology....total ~295 hours which more than meets the 200 hour NRC requirement for 35.690(b)(1)(i). As regards 35.690(b)(1)(ii), Dr. Chin also states, in the 4th paragraph of his letter that their program meets the requirement of 500 hours of hands-on training on Dr. Strasser's part under the supervision of Dr. Chin's and Dr. Harris' faculty. This seems reasonable, especially given the presence of an AMP at each of the HDR patient treatments that Dr. Strasser participated in as documented in Appendix F of our letter dated July 22, 2005 (NRC Mail Control No. 136985).

At Christiana Care, Dr. Strasser has also participated in our HDR program under the direct supervision our six other radiation oncologist AMU's and four AMP's who are performing about 550 HDR treatments per year with the associated treatment planning, dosimetry, and QA. Attachment 3 documents that Dr. Strasser has taken our annual refresher course on HDR emergency procedures per manufacturer instructions and established guidelines. This all satisfies your request for documentation that Dr. Strasser also meet the requirements of 35.690(c).

If you need further information or clarification please contact Dr. Larry Simpson:

302-545-3870 voice
LSimpson@ChristianaCare.org

He shall keep me fully-informed on progress in these matters.

Sincerely,

Patrick A. Grusenmeyer, Sc.D., FACHE
Vice President, Cancer Program
Christiana Care Health System

cc:
Christopher Koprowski, MD, Chair, Radiation Oncology
Larry D. Simpson, Ph.D., Director, Medical Physics
Joseph R. Solge, Jr., Radiation Safety Officer

Attachment 1-1

BRIGHAM AND
WOMEN'S HOSPITAL

HARVARD
MEDICAL SCHOOL

75 Francis Street
Boston, MA 02115
Tel: 617 732-6057; Fax: 617 566-9574
Email: fcastronovo@partners.org

Frank P. Castronovo, Jr., Ph.D., FASHP, FACR
Director, Department of Health Physics
& Radiopharmacology
Radiation & Nonionizing Safety Officer
Radiopharmacist Radiopharmacologist
Associate Professor of Radiology
Harvard Medical School

27 March 06

MEMORANDUM

To: Randolph C. Ragland, Jr.
Senior Health Physicist
NRC Region I
King of Prussia, PA 19426

From: Frank P. Castronovo, Jr., PhD FPC
Radiation Safety Officer
Brigham and Women's Hospital
Boston, MA 02115

Re: Jon Strasser, MD: Application to Become an Authorized User

Dr. Jon Strasser has requested I document the training and experience of several members of the Radiation Oncology Department at Brigham and Women's Hospital, Boston Massachusetts. For the record the Brigham and Women's Hospital possesses Agreement Broad License # 44-0004.
Jay Harris, MD, Director of the Department of Radiation Oncology, has been issued a permit to use radioactive material for brachytherapy purposes. It is assigned permit #900, and is enclosed for your information.
The Radiation Safety Committee has approved Phillip Devlin, MD and Akila Viswanathan, MD as authorized users under permit #900. In addition, Robert Cormack, PhD is a member of the Radiation Physics Division of the Oncology Department. Lee Chin, Sc.D. is the director of this division and he is the Radiation Physicist Authorized User on the Broad License.
Please contact me if additional information is needed.

cc
Jon Strasser, MD

1 - 2

BRIGHAM AND WOMEN'S HOSPITAL

HARVARD MEDICAL SCHOOL

75 Francis Street
Boston, MA 02115
Tel: 617 732-6057; Fax: 617 566-9574
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Frank P. Castronovo, Jr., Ph.D., FASHP, FACR
Department of Radiology
Division of Health Physics
& Radiopharmacology
Radiation & Nonionizing Safety Officer
Radiopharmacist, Radiopharmacologist
Associate Professor of Radiology
Harvard Medical School

MEMORANDUM

TO: Jay Harris, M.D.
Chair
Radiation Oncology

FROM: Frank P. Castronovo, Jr., Ph.D. FPC
Radiation Safety Officer
Carrie Hall 5

DATE: June 8, 2005

SUBJECT: **Updated Permit # 900**

Attached is your official Human Use Permit # 900 to use radioactive material at the Brigham and Women's Hospital. This permit expires in two years and shall be amended on a timely basis. Please **Review it for accuracy**. Thank you.

Attachment

cc Permit File

1-3

Brigham and Women's Hospital
Human Use Permit to
Use Radioactive Material

A permit is hereby issued authorizing the individual(s) named herein to use a brachytherapy sources for therapeutic purposes. This permit is subject to all applicable rules and regulations of the Hospital and in particular to the provisions under 105CMR 120.000 of the "Rules and Regulations to Control the Radiation Hazards of Radioactive Materials and of Machines which Emit Ionizing Radiation" adopted by the Department of Public Health, Commonwealth of Massachusetts. This use of the equipment for this project shall only be on the Hospital premises and by, or under the supervision of, the named individuals.

Radiopharmaceuticals for use in humans shall be acquired from a supplier who certified the pharmaceutical quality and assay of such material. If radiopharmaceuticals are prepared for human use, the methods of establishing pharmaceutical quality shall be approved by the Radioactive Drug Research Committee or the Radiation Safety Committee.

1. Jay Harris, M.D.
   Principal Investigator

2. 900
   Permit Number

3. Radiation Oncology
   Department or Laboratory

4. June 2007
   Expiration Date

5. I-125, Cs-137, Ir-192, Pd-103, and Sr-90
   Authorized Use

Approved By:

Frank P. Castronovo, Jr., Ph.D.
Administrator, RSC/RDRC

Date Issued: June 8, 2005

Attachment 2-1

BRIGHAM AND
WOMEN'S HOSPITAL

HARVARD
MEDICAL SCHOOL

Department of Radiation Oncology
75 Francis Street
Boston, Massachusetts 02115

Tel: 617 525-7124, Fax: 617 582-6037
E-Mail: lchin@lroc.harvard.edu

Lee M. Chin, D.Sc.
Chief of Medical Physics

Longwood Radiation Oncology Center
Brigham and Women's Hospital
Dana-Farber Cancer Institute
The Children's Hospital

Associate Professor of Radiation Oncology
Harvard Medical School

April 5, 2006

To Whom It May Concern:

This letter is to confirm that Jon Strasser, MD, was a resident in radiation oncology here in our department, and completed the required 200 hours of physics training. As the Chief of Medical Physics and the Coordinator of the Physics Training Program for the clinical residents, I would like to briefly describe the content of the program.

Our physics training program runs over a period of four years. During the last 6 years, we have made minor changes in better integrating the subject materials. The presentation sequence might be slightly different, but the syllabus has been the same. Our curriculum does cover radiation physics and instrumentation, radiation protection, mathematics pertaining to the use and measurement of radioactivity, and radiation biology. The text books we use are Khan's Physics of Radiation therapy, and also Hall's Radiobiology for the Radiologist. We often supplement with lectures notes and problems sets.

When the residents come in July each year, we start an intensive 2-week course in physics and radiation biology. They attend lectures and laboratory sessions every day for a total of about 63 contact hours (51 hours of physics and 12 hours of biology; please see attached description of this summer course). Then we have a continuing education course in physics each year where they attend a lecture/problem solving session once a week. This continuing education program contains about 38 contact hours with physicists throughout the year (please see attached CE physics program), and they are required to attend all the sessions for all four years, i.e. a total of about 152 hours. The total number of classroom instruction totals to about 215 hours.

Besides these didactic training sessions, during their clinical training, our residents also receive hands on training under the supervision of both our physics and physician staff who meet the requirements in § 35.690 on reviewing full calibration measurements and periodic spot-checks, preparing treatment plans and calculating treatment doses and times, using administrative controls to prevent a medical event involving the use of byproduct material, implementing emergency procedures to be followed in the event of the abnormal operation of the medical unit or console, checking and using survey meters and selecting the proper dose and how it is to be administered.

I would be happy to provide further information or clarification of our physics program.

Sincerely yours,

Lee M Chin, D.Sc.
Chief of Medical Physics.

Attachments

COMBINED MGH/B & W/DF/BIDMC PHYSICS/RADIATION BIOLOGY COURSE SCHEDULE FOR NEW RESIDENTS

July 5th – July 15th, 2005

Meeting Locations:

Unless otherwise stated,

All MGH lectures are delivered in the conference room on Cox 8 unless otherwise stated. All Longwood Campus lectures are delivered at the Galleria-3 conference room, and all Longwood Campus Morning conferences take place at Shields Warren –1 Conf Room.

Tuesday, July 5 (MGH)

7:45 - 8:00	Introduction and Welcome - Jay Loeffler, Anthony Zietman, Paul Busse & Reshma Jagsi	NPTC
8:00 - 9:00	Atomic and Nuclear Physics *atomic & nuclear structure, energy levels, elementary particles, binding energy, chart of isotopes, radioactive decay*	Harald Paganetti Note!! - NPTC
9:05 - 10:00	X-Ray Production *history of x-ray in RT, bremsstrahlung & characteristic radiation, x-ray tubes, targets, filters*	John Wolfgang
10:00 - 11:00	Photon Interactions *coherent scattering, photoelectric effect, compton scattering, pair production, ionization & excitation*	Steve Jiang
11:00 - 12:00	Attenuation and absorption *coefficients, Z and energy dependence, concept of HVT for description of beam quality*	Jong Kung
12:00 - 12:45	Lunch	
12:45 - 5:00	Radiation Biology	Kathy Held

Wednesday, July 6 (MGH)

8:00 - 9:00	Clinical seminar	NPTC

9:00 - 10.00	Measurement of Radiation & Instrumentation *exposure & dose, ionization in air, dose to tissue; ionization chambers and other dose measuring techniques*	Peter Biggs
10:00 - 11:00	Dose instrumentation *ionization chambers, Geiger counters, TLDs, film, diodes*	John Wolfgang
11:00 - 12:00	Radiation Therapy Treatment Units *contact & orthovoltage, cobalt-60, linear accelerator & cyclotron*	Peter Biggs
12:00 - 12:45	Lunch	
12:45 - 1:45	Radiation Beam Characteristics-I Photons: *build-up, depth dose distributions, profiles and isodose curves*	Karen Doppke
1:45 - 2:45	Radiation Beam Characteristics-II Electrons: *depth dose distributions, d_{50}, practical range, isodose curves, surface dose*	Karen Doppke
2:45 - 5:00	Radiation Biology	K

Thursday, July 7 (MGH)

8:00 - 9:00	Clinical seminar	NPTC
9:00 - 12:00	Orientation	Burr 4 conference room
	Meet Marilyn Cassidy at her office, MGH, Cox 3, (outside of Room 341). Please call Marilyn Cassidy for questions at 617-724-1158.	
1:00 - 3:00	Radiation Dosimetry *%DD, TAR, TMR, TPR, BSF, FSD basic chart orientation*	Jackie Nyamwanda
3:00 - 5:00	Radiation Biology	K

Friday, July 8 (MGH)

8:00 - 9:00	Clinical seminar	NPTC
9:00 - 11:00	Patient Dose Calculations *SSD & SAD calculations, single fields, independent jaws off isocenter calcs using IVS & D factor electrons, review calc. methods using physics sheets gap calculations*	Jennifer Feng
11:00 - 12:15	Clinical Instrumentation *electronic portal imagers, multileaf collimators*	David Gierga
12:15 - 1:00	Lunch	
1:00 - 3:00	Dose distributions *examples of isodose curves and dose distributions, general concepts, wedge and beam angles*	Nathan Leafgren
3:00 - 4:00	Proton therapy	Skip Rosenthal
4:00 - 5:00	Claire Cronin (Founders 5 Medical Records), Kathy Bruce (Cox LL), Katie Mannix (Cox LL)	

Monday, July 11 (MGH)

8:00 - 9:00	Clinical seminar	NPTC
9:00 - 11:00	Radiation Biology	Kathy Held
11:00 - 12:00	CT Simulator Orientation (Cox LL)	Nancy DiTullio
12:00 - 12:45	Lunch	
12:45 - 3:15	CT Sim & GE Workstation (Cox LL)	Karen Doppke
3:15 - 5:00	Radiation Biology	Kathy Held

Tuesday, July 12 (MGH/LONGWOOD)

For residents starting rotation at MGH:

8:00 - 10:00	CMS planning- Planning (Cox 3)	Karen Doppke et. al
10:00 - 11:15	CMS planning – drawing/fusion (Cox 3)	Karen Doppke et. al.
11:15 - 12:00	Tour of brachytherapy lab	Tom Mauceri
12:00 - 12:30	Lunch	

For residents starting rotation at B&W/BIDMC/DF

8:00 - 9:00	Morning conference	Smith 308
9:00 - 12:00	ADAC Planning Training	BIDMC-Shapiro 5
12:00 - 12:45	Lunch	

All residents: (LONGWOOD) **Galleria conf room**

1:00 - 2:00	Simulation and patient Data	Xing-Qi Lu
2:00 - 3:00	CT and MRI	Stead Kiger
3:00 - 4:00	PET and PET/CT	Joseph Killoran
4:00 - 5:00	ICRU for Treatment Planning	Edward Holupka

Wednesday, July 13 (LONGWOOD)

8:00 - 9:00	Morning conference	DFCI-1620

All residents: **Galleria conf room**

9:15 - 10:45	Treatment Planning of Prostate/IMRT *Example of CT-sim process, contouring, setup issues, application of ICRU planning concepts*	Killoran/Hacker
11:00 - 12:15	Treatment planning of Head and Neck/IMRT *Work on prostate cases:, planning and dose calculations, volume displays, DVH*	Laurence Court
12:15 - 1:00	Lunch	

1:00	- 2:30	Brachytherapy I *Basic brachytherapy concepts, techniques*	Robert Cormack
2:30	- 4:00	Brachytherapy 2 *Practical application:,Planar, volume, molds, LDR, permanent and temporary implants*	Robert Cormack
4:00	- 5:00	Treatment planning with electron beams *Hand calculations, graphic plans*	Xing-Qi Lu

Thursday, July 14 **(LONGWOOD)**

8:00	- 9:00	Morning Conference	Smith 308
All residents:			**Galleria conf room**
9:15	- 11:15	Brachytherapy 3	
		Special techniques: HDR, IVBT, Image guided procedures, Demo HDR, Prostate I-125 implants	*R. Cormack*
11:30	- 2:45	DFCI orientation	
3:00	- 4:00	Stereotactic Irradiation	Fred Hacker
4:00	- 5:00	Radiation Protection	Goran Svensson

Friday, July 15 (LONGWOOD)

8:00	- 9:00	Morning conference	BIDMC TBA
All residents:			**Galleria conf room**
9:15	- 11:15	IMRT techniques, 3D and inverse planning,	Ed Holupka
11:15	- 12:15	Radiation Protection Practical Issues	Hansen/Beaupre
12:15	- 1:00	Lunch	
1:00	- 3:00	CT-simulation and planning of Breast. *Lab exercise: CT-simulation of breast cancer; typical dose*	Maria Czerminska

planning, simple tangents, 3-fields, 4-fields

3:00 - 5:00 Conventional Simulation procedures **(at BWH)**
Lab exercises: introduction to simulator, fluoroscopy, film/screen, basic operations, simple planning techniques, immobilization, set-up devices

End of Course

JCRT Resident Physics Course Summer 2000

	Monday 09-Jul	Tuesday 10-Jul	Wednesday 11-Jul	Thursday 12-Jul	Friday 13-Jul
8:00-9:00	Morning Conference	Morning Conference	Morning Conference	Morning Conference	Morning Conference
9:15-10:30	Introduction to basic radiobiology **BUSSE**	Beam data 1 (PDD, TAR, TMR, TPR ...) **ZYGMANSKI**	Introduction on: Simulator:fluoroscopy CT, CT-sim MRI, ultrasound **HOLUPKA**	Radiation Protection **SVENSSON**	**at BWH residents-suite** Introduction to IMPAC; Partners Network **KUSMIN**
10:45-12:00	Intro to clinical radiobiology **HOWES**	Beam data 2 (SAR, SMR, properties) (primary+scatter model) **ZYGMANSKY**	Treatment Planning 1-2 fields **HACKER**	Treatment Planning Beam Modifiers Multiple fields **CORMACK**	and, **11:15 pm at BIDMC** Caregroup Network **MITCHELL**
12:00-1:30	Lunch w. Dr. Harris. Galleria conf. Room				
1:30-2:45	Treatment Machines orthovoltage/cobalt cyclotrons/betatrons **XQ-LU**	Beam calibration and measurements **HANSEN**	Treatment Planning JCRT calculations **HM LU**		Radiation Safety Procedures **ZHANG**
2:45-4:30	Treatment Machines linear accelerators **XQ-LU**	**Lab:(3 pm at BIDMC)** Dose measurements photons, electrons PPD, TMR,film **XQ-LU**	Review /problem sets **MAKRIGIORGOS**	**Lab: (3 pm at BIDMC)** CT-sim lung **MORSE**	

JCRT Resident Physics Course Summer 2000

	Monday 16-Jul	Tuesday 17-Jul	Wednesday 18-Jul	Thursday 19-Jul	
8:00-9:00	Morning Conference	Morning Conference	Morning Conference	Morning Conference	
9:15-10:30	electron planning **MAKRIGIORGOS**	Treatment Planning Brachytherapy **CORMACK**	**Lab (9-10 am at BWH)** Pelvic Planning 3/4/6 field plans **BEARD/KILLORAN**	Prostate Brachytherapy **HOLUPKA**	
10:45-12:00	Heterogeneity correction **ZYGMANSKI**	Treatment Planning Brachytherapy II **CORMACK**	**(10-11 am at BWH)** **KILLORAN**	**11 am, at BWH** meet w. Andy Formosi	
12:00-1:30		Lunch Break			
1:30-2:45	Review /problem sets **HANSEN**	Treament Planning Breast planning **HM LU**	Stereotactic XRT **HACKER**	**1 pm at BIDMC** meet Rosa Amezquita	
2:45-4:30	**3pm at BIDMC** AP-PA exercises wedges, compensators isodoses **HOLUPKA & ARBO**	**Lab: (3:00pm at BWH)** Breast SIM-CT (3-4pm) AND Varian CT (4-5pm) **HM LU/sim Staff**			

JCRT Resident Physics Course Summer 2001

All lectures are at the Galleria Physics Conference Room

	Monday	Tuesday	Wednesday	Thursday 05-Jul	Friday 06-Jul
8:00-9:00	Morning Conference	Morning Conference	4TH JULY -HOLIDAY	Morning Conference	Morning Conference
9:15-12pm	DFCI orientation	Meet w. Chief Resident **VISWANATHAN**		Introduction; Review of Atomic & Nuclear Physics I **MAKRIGIORGOS**	Photon Interactions **BUES**
				Review of Atomic & Nuclear Physics II **MAKRIGIORGOS**	Electron interactions x-ray production **BUES**
12:00-1:30					
1:30-2:45	Ids, beepers, business cards and any other admin items; Jennifer Miller				Dosimetric quantities Dose measurements **BUES**
2:45-4:30					

05-06 JCRT RESIDENT PHYSICS COURSE

8-9 am Longwood Area Room: Dana 1635, unless otherwise noted in Morning Conference Schedule

Revision date: July 2005

Session	Topic	Date	Instructor	Kahn	Raphex 2001-2004 Questions
1	Structure of Matter, Nuclear Transformations	09/07/2005	Makrigiorgos	1, 2	R01_(G1-G39); R02_(G1-G37); R03_(G1-G33); R04_(G1-G38)
2	Interactions of Ionzing Radiation---Photons I	09/14/2005	Makrigiorgos	5	R01_(G56-G62); R02_(G53-G61); R03_(G49-G59); R04_(G56-G66)
3	Interactions of Ionizing Radiation ---Photons II	09/21/2005	Makrigiorgos	5	R01_(G63-G69); R02_(G62-G69); R03_(G60-G64); R04_(G67-G73)
4	Production of X-Rays, Clinical Radiation Generators	09/28/2005	Killoran	3, 4	R01_(G41-G50 and T71-T76); R02_(G38-G45 and T84-T89); R03_(G36-G42 and T86-T88); R04_(G41-G49 and T84-T89)
5	Measurement of ionizing radiation, quality of X-ray beams	10/05/2005	Killoran	6,7	R01_(G89-G92); R03_(G95-G98); R04_(G95,G96)
6	Measurement of absorbed dose	10/12/2005	Killoran	8	R01_(T1, T2 and T85-T86); R02_(T1-T6 and T97); R03_(T1-T5 and T96); R04_(T1-T3 and T96)
7	No lecture -ASTRO	10/19/2005			
8	Dose Distribution and Scatter Analysis	10/26/2005	Hacker	9	R01_(T1-T11, T25); R02_(T1-T18, T36,T37); R03_(T1-T15, T30-T36); R04_(T1-T12, T27,T29)
9	Dose Distribution and Scatter Analysis	11/02/2005	Hacker	9	R01_(T1-T11, T25); R02_(T1-T18, T36,T37); R03_(T1-T15, T30-T36); R04_(T1-T12, T27,T29)
10	A System of Dosimetric Calculations	11/09/2005	Hacker	10	R01_(T22-T24, T32); R02_(T31-T35, T46); R03_(T29, T44-T45); R04_(T26,T28T38,T39)
11	Heavy Particle interactions and beam characteristics	11/16/2005	Kiger	lecture	R01_(G64,G70,G71); R02_(G11, G70-G72); R03_(G65-G69); R04_(G74-G78)
12	TBA	11/23/2005			
13	Use of imaging modalities for treatment planning	11/30/2005	Holupka	lecture	R01_(T29, T87-T90); R02_(T41-T43, T98); R03_(T42, T58-T63); R04_(T34,T35,T55-T57)
14	Treatment Planning I	12/07/2005	Czerminska	11	R01_(T12-T15); R02_(T20-T24, T38); R03_(T16-T21, T39); R04_(T13-T17)
15	*Treatment Planning I*	12/14/2005	Czerminska	11	R01_(T12-T15); R02_(T20-T24, T38); R03_(T16-T21, T39); R04_(T13-T17)
16	Treatment Planning II	12/21/2005	Czerminska	12	R01_(T17-T21); R02_(T27-T30); R03_(T25-T28); R04_(T18-T25)
17	TBA	12/28/2005			
18	Treatment Planning III	01/04/2006	Czerminska	13	R01_(T16, T39-T42); R02_(T25, T55-T56); R03_(T23,T24, T51-T54); R04_(T20-T22, T49-T51)
19	Basics of Inhomogeneity corrections (photons)	01/11/2006			R01_(T30-T31); R02_(T44-T45); R03_(T43); R04_(T37)
20	Electron Beam Characteristics	01/18/2006	Makrigiorgos	14	R01_(T44-T49); R02_(T57-T61); R03_(T64-T69); R04_(T59,T63)
21	Electron beam TP applications	01/25/2006	Makrigiorgos	14	R01_(T50-T64); R02_(T26, T59,T62,T64); R03_(T70-T71); R04_(T64)
22	*Breast Irradiation*	02/01/2006	Lyatskaya	lecture	
23	Hodgkins Irradiation	02/08/2006	Czerminska	lecture	
24	Brachytherapy I (Basics)	02/15/2006	XQ Lu	15	R01_(T53-T57, T61-T67); R02_(T65-T71, T77-T80); R03_(T73-T76); R04_(T65-T70, T76,T77)
25	Brachytherapy I (TP applications)	02/22/2006	XQ Lu	15	R01_(T58,T68); R02_(T81,T82); R03_(T81); R04_(T68, T78,T79)
26	Brachytherapy: Image guided implant techniques	03/01/2006	Cormack	lecture	
27	Brachytherapy: HDR and Vascular irradiation	03/08/2006	Cormack	lecture	
28	Radiation Protection	03/15/2006	Svensson	16	R01_(G75-G88); R02_(G86-G99); R03_(G82-G94); R04_(G85-G94)
29	*Quality Assurance*	03/22/2006	Svensson	17	R01_(T77, T78); R02_(T90, T91); R04_(T90)
30	IMRT applications	03/29/2006	Zygmanski	lecture	R03_(T55-T57); R04_(T52-T54)
31	Stereotactic applications	04/05/2006	Hacker	lecture	R01_(T37); R02_(T52-T54); R04_(T47,T48)
32	TBA	04/12/2006			
33	Principles of Nuclear Medicine-- Gamma Camera	04/19/2006	Moore	Lecture	
34	Diagnostic Radiology (screen-film sys, image quant, rad basics)	04/26/2006	Nawfel	Lecture	
35	Diagnostic radiology raphex questions	05/03/2006	BIDMC-TBA		R01_(D8-D15); R02_(D15-D24); R03_(D10-D28); R04_(D14-D1(, D20-D25, D31)
36	Principles of CT	05/10/2006	Nawfel	Lecture	
37	Principles of PET; PET/CT fusion for treatment planning	05/17/2006	F. Fahey	Lecture	
38	Principles of MRI	05/24/2006	BIDMC-TBA	Lecture	

2-12

MASSACHUSETTS GENERAL HOSPITAL

HARVARD MEDICAL SCHOOL

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Kathryn D. Held, Ph.D.
Associate Radiation Biologist, MGH
Associate Professor, HMS

March 27, 2006

To Whom It May Concern
Nuclear Regulatory Commission

Dear Sir or Madam:

This letter is to certify that Dr. Jon Strasser took the Harvard Medical School Radiation Biology course that I teach at Massachusetts General Hospital/Harvard Medical School. A copy of the course curriculum is attached. Additionally, he participated in extra Radiation Biology seminars, discussions and review sessions. I estimate that over the course of his 4 years as a Radiation Oncology resident at Harvard Dr. Strasser received about 80 hours of instruction in Radiation Biology.

If you have any questions about his training in this area, please feel free to contact me.

Sincerely,

Kathryn D. Held, Ph.D.

Enclosure

As of 3/27/2006

Cellular, Molecular and Tissue Radiation Biology
Department of Radiation Oncology, Massachusetts General Hospital
Joint Center for Radiation Oncology
Harvard Medical School
Fall 2004/Winter 2005

Date	Topic	Speaker
Wed., Oct. 13, 2004	Radiation chemistry; effects on DNA and chromosomes	K. D. Held
Mon., Oct. 18, 2004	No regular class; Visiting lecturer Ashok Venkitaraman	
Wed., Oct. 20, 2004	No regular class; visiting lecturer Bleddyn Jones	
Mon., Oct. 25, 2004	Effects on DNA (cont.); Cell survival curves	K. D. Held
Wed., Oct. 27, 2004	Survival curves (cont.)	K. D. Held
Mon., Nov. 1, 2004	OER and LET effects	K. D. Held
Wed., Nov. 3, 2004	Chemical Modification	K. D. Held
Mon., Nov. 8, 2004	Chemical modification (cont.)	K. D. Held
Wed., Nov. 10, 2004	Repair of SLD and PLD	K. D. Held
Mon., Nov. 15, 2004	Cell cycle and cell kinetics	K. D. Held
Wed., Nov. 17, 2004 (I'll be away)	Introduction to molecular biology techniques	B. D. Price
Mon., Nov. 22, 2004 (I'll be away)	Transformation, oncogenes, tumor suppressor genes	B. D. Price
Wed., Nov. 24, 2004	No lecture – Thanksgiving Eve	
Mon., Nov. 29, 2004	Molecular biology of the cell cycle and checkpoints	B. D. Price
Wed., Dec. 1, 2004	Tumor radiation biology	K.D. Held
Mon., Dec. 6, 2004	Molecular biology of DNA repair	B. D. Price
Wed., Dec. 8, 2004	Signal transduction	cancelled
Mon., Dec. 13, 2004	Apoptosis pathways	D. Fisher
Wed., Dec. 15, 2004	No lecture	
Mon., Dec. 20, 2004	Radiation-induced apoptosis	K.D. Held
Wed., Dec. 22, 2004	Radiation biology of normal tissues (inc. acute effects and fetus)	K.D. Held
Dec. 27 and 29, 2004	No lectures	
Mon., Jan. 3, 2005	Tumor pathophysiology I: Angiogenesis and vascular compartment	R.K. Jain

As of 3/27/2006

Wed., Jan. 5, 2005	Tumor pathophysiology II: Extravascular compartment	R.K. Jain
Mon., Jan. 10, 2005	Fractionation	K.D. Held
Wed., Jan. 12, 2005	Calculations of cell survival curves and fractionation	K.D. Held
Mon., Jan. 17, 2005	No lecture – MKL Holiday	
Wed., Jan. 19, 2005	Problem calculations (cont)	K.D. Held
Mon., Jan 24, 2005	Interactions of chemotherapy and radiation therapy	cancelled due to weather
Wed., Jan 26, 2005	Late effects of radiation (mutagenesis, carcinogenesis)	K.D. Held
Mon., Jan 31, 2005	Hyperthermia	L.E. Gerweck
Wed., Feb. 2, 2005	Genomic instability, bystander effects and other low dose responses	K.D. Held
Mon., Feb. 7, 2005 (I'm away)	Bench to Bedside	A. Taghian
Wed., Feb. 9, 2005	Genetic susceptibility	J.E. Garber
Mon., Feb. 14, 2005		
Wed., Feb. 16, 2005	Photodynamic therapy	T. Hasan
Mon., Feb. 21, 2005	No lecture – Presidents' Day Holiday	
Wed., Feb. 23, 2005	Radiation-induced gene expression	A. Fornace
Mon., Feb. 28, 2005	Gene therapy	T. DeWeese
Wed., Mar. 2, 2005		
Mon., Mar. 7, 2005	Interactions of chemotherapy and radiation therapy	S. Rockwell
Wed., Mar. 9, 2005	Exam	

Questions/comments, contact:
Kathryn D. Held, Ph.D.
phone: 617-726-8161
email: kheld@partners.org

Nucletron

Field Training Report

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Nucletron Corporation, Service Department, 8671 Robert Fulton Drive, Columbia, MD 21046 PH: 410-872-4400 Fax: 410-312-4196

Customer: Christiana Hospital	Charge Type: ☑ Contract ☐ No Charge ☐ Bill ☐ Install ☐ Warranty ☐ Other
Address: 4755 Ogletown-Stanton Road, Newark, DE	Call Number ☐ Rtn. Visit Required
Phone No.	Course Instructor: Dayee Jacob — Date In Out
PO No.	Time In Out

Training Given

mHDR Annual Emergency Procedures In-Service

Attendance Registration

Name	Title	Department	Signature
Janet Mento	RTT	Rad Oncology	
Carole Robinson	RTT	Rad Oncology	
Larry Simpson	Physicist	Rad Oncology	7/29/05
Brenda McKay	RN	Rad Oncology	
Jon Strasser	MD	Rad Oncology	
Adam Raben	MD	Rad Oncology	
Jodie Noonan	Dosimetrist	Rad Oncology	

Remarks

For Office Use Only - This Is Not An Invoice

Travel Charged	Hrs	Airline		Travel Expenses (Meals, Tolls, etc)
Regular Charged	Hrs	Rental Car		
Overtime Charged	Hrs	Hotel		
O/T (Sundays & Holidays)	Hrs	No of Miles	$0.00	

We certify that the training noted in this document has been carried out in accordance with the manufacturer's instructions by Nucletron's authorized representative and with proper supervision by:

Course Instructor 7/29/05 Customer

EMERGENCY PROCEDURES

FOR

microSelectron-HDR

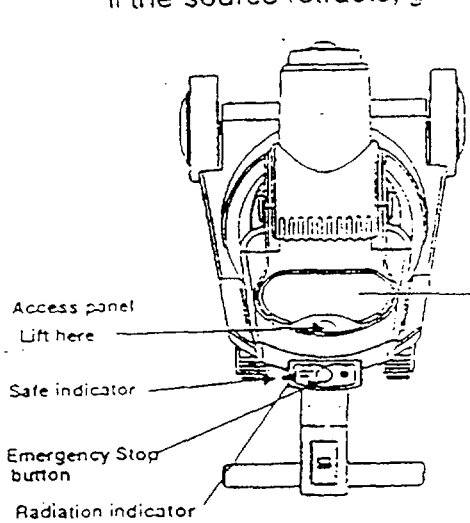
IF THE SOURCE FAILS TO RETURN TO THE SAFE

3 - 3

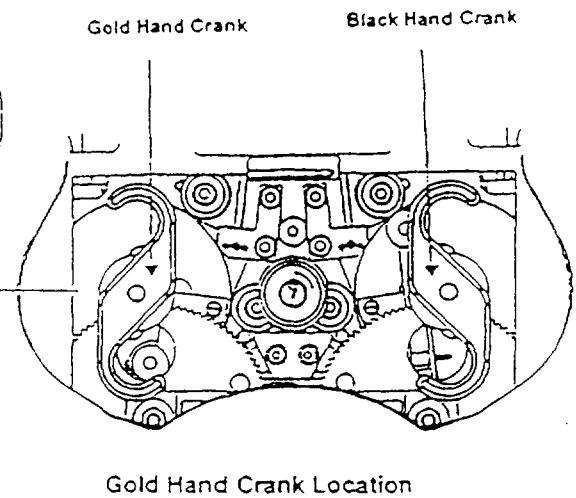
1. Depress RED EMERGENCY STOP BUTTON on emergency stop button on the treatment control panel. If the source retracts, go to step 7, otherwise step 2.

2. Enter the treatment room.

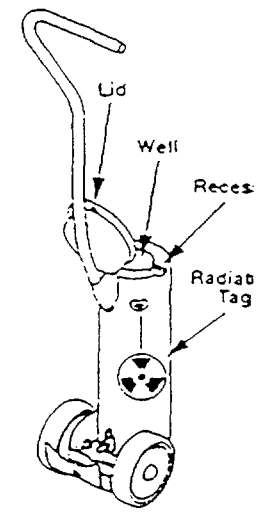
   - Lift the access panel on top of the treatment unit to access the GOLD hand crank. Turn it in the direction of the arrows (on the hand crank) until it blocks.
   - If the source retracts, go to step 7, otherwise step 3.



Access Panel Location



Gold Hand Crank Location



Emergency Container

3. Check the patient for radiation. If detected, remove the applicator from the patient, ensuring that radiation is confined to the applicator. Open the lid of the Emergency Container. Insert the applicator containing the source into the well, using long forceps. Guide the transfer tube through the recess at the container edge. Close the lid. Leave the radiation warning tag hanging outside the container, to indicate it contains radioactive material.

4. IMMEDIATELY assist the patient from the room.

5. Ensure that the applicator and source are safely stored inside the emergency container.

6. Leave the room. Close the door. Mark it NO ENTRY.

7. Retain the treatment data printout and contact the following:

Physicist: DAVID JACOB Tel. 302-733-1453

Doctor: Michael Sorenson Tel. 302-623-4515

Nucletron-Oldelft Representative: TECHNICAL SUPPORT Tel. 1-800-336-2249

R.S.O Larry Simpson PhD Tel. 302-545-3870

The unintended radiation dose to which those present have been subjected should be estimated and recorded by a suitably qualified person.

CHRISTIANA CARE HEALTH SERVICES

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Radiation oncology

HDR Emergency Procedures

(For source not returning to its Shielded Position)

On each treatment day the attending Physicist will accept the responsibility for preparing for the emergency procedure and will respond to an emergency, should one occur that day.
Another staff member, either the Therapist or the Dosimetrist on duty will be available to start a stop watch when it is realized that the HDR source is jammed.

The Physicist will prepare for an emergency by assuring that a wire cutter , a pair of long forceps, survey meter and a stopwatch are set out on the counter and immediately available. A shielded container will be placed close to the area where it will be needed in the treatment room. It will be assured that radiation badges are worn by all persons who would enter the room for an emergency.
First an attempt would be made to retract the source to its shielded position with in the treatment unit by pressing the **Red Emergency Stop** button on the treatment console. If the source fails to retract, then the Physicist will enter the treatment room with the survey instrument, approach the HDR unit and note the exposure reading.

The therapist/dosimetrist will start the stopwatch as soon as it is realized that the source has not retracted.

The Physicist will lift the access panel cover on top of the treatment unit to access the **GOLD** hand crank and attempt to manually rewind the cable until the source is in its shielded position. If it can be retracted into the unit, the survey instrument will be then used to verify that the source is in the shielded position. If the source returns the patient will be removed as usual.
If not fully retracted the Physicist will check the patient for radiation . If detected the applicator will be removed from the patient (with the Physicians' help if necessary), ensuring that radiation is confined to the applicator. The applicator containing the source is then inserted into the well of the emergency container using long forceps. The transfer tube is guided through the recess at the container edge. The container is closed with the lid. The radiation warning tag will be hanging outside the container indicating the radioactive material inside.

The patient will be surveyed again and removed immediately.

The Physicist will leave the room and the door will be closed and marked **NO ENTRY.**

The treatment data printout will be retained and the Radiation Safety Officer shall then be immediately notified of the incident.

Contact Nucletron at 1-800-336-2249.

Authorized Medical Physicists: Larry Simpson, Ph.D Cell: 302-545-3870 Pager: 451-2086
Dayee Jacob , M.S. 302-733-1453 Pager: 733-3734/5316

This is to acknowledge the receipt of your letter/application dated

6/29/2006, and to inform you that the initial processing which includes an administrative review has been performed.

☑ There were no administrative omissions. Your application was assigned to a technical reviewer. Please note that the technical review may identify additional omissions or require additional information. AMENDMENT 07-12153-01

☐ Please provide to this office within 30 days of your receipt of this card

_____.

A copy of your action has been forwarded to our License Fee & Accounts Receivable Branch, who will contact you separately if there is a fee issue involved.

Your action has been assigned **Mail Control Number** 139062.
When calling to inquire about this action, please refer to this control number.
You may call us on (610) 337-5398, or 337-5260.

NRC FORM 532 (RI)
(6-96)

Sincerely,
Licensing Assistance Team Leader