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From Sandy Wolff  
Radiation Safety Officer  
Sentara Hospitals  
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45-00131-02 140700  
03003298

Date 8/20/07

Number of pages including cover page  
10

Subject Amendment request

Please see bottom of CV  
page 3 for additional  
residency activity details  
New 313 also attached.

Thank you - Sandy



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Sentara Healthcare 6015 Poplar Hall Drive, Suite 101 Norfolk, VA 23502

140700

Phone [REDACTED] • E-MAIL: [REDACTED]

→ **DR. VIRGINIA L. LOCKAMY** ←

→ **EDUCATION**

- June 2004-August 2005* University of Minnesota (Minneapolis, MN)  
Postdoctoral Residency
- August 2000 - May 2004* Wake Forest University (Winston-Salem, NC)  
PhD, Physics
- August 1996 - May 2000* North Carolina State University (Raleigh, NC)  
B.S. Physics; B.S. Applied Mathematics

→ **PROFESSIONAL EXPERIENCE**

- January 2007 - Present* Sentara Norfolk General Hospital (Norfolk, VA)  
Medical Physicist (Dept. of Radiation Oncology)
- Perform clinical duties of medical physicist including monthly and annual QA, treatment planning, patient treatment verification QA, monitor unit calculations, etc; fill in at satellite centers when other physicists and/or dosimetrists on vacation
- September 2005 - December 2006* Albemarle Hospital (Elizabeth City, NC)  
Medical Physicist (Regional Oncology Center; solo position)
- Perform clinical duties of medical physicist including monthly and annual QA, treatment planning, patient treatment verification QA, monitor unit calculations, etc; commissioned IMRT program; commissioned GE-CT Sim program; acted as both physicist and dosimetrist while dosimetrist out on maternity leave; implemented paperless charting by preparing all documents for charting; served on Radiation Protection Committee; contact person for all x-ray equipment for hospital and all satellite centers
- June 2004 - August 2005* University of Minnesota (Minneapolis, MN)  
Postdoctoral Resident (Dept. of Therapeutic Radiology/Radiation Onc.)
- Perform clinical duties of medical physicist including monthly and annual QA, treatment planning, patient treatment verification QA, monitor unit calculations, etc; medical physics instruction for radiation therapy students; clinical instruction for radiation therapy students
- May 2004 - June 2004* Wake Forest University (Winston-Salem, NC)  
Postdoctoral Researcher (Dr. D.B. Kim-Shapiro, Dr. S.B. King)
- Manage laboratory/research endeavors, assist with alternate research topics, train new members of the laboratory staff, consult and prepare future research topics for publication
- January 2001 - May 2004* Wake Forest University (Winston-Salem, NC)  
Graduate Research Assistant (Dr. D.B. Kim-Shapiro, Dr. S.B. King)
- Perform research for dissertation; develop unique approaches to researching a common goal project in the laboratory
- August 2000 - December 2000* Wake Forest University (Winston-Salem, NC)  
Graduate Teaching Assistant
- Lead tutorial sessions; class evaluations; grading papers
- January 2000 - May 2000* Triangle Learning Consultants (Raleigh, NC)  
Tutor for physics and math (middle and high school students);
- Prepare homework and tests for troubled teens
- January 1998 - May 2000* North Carolina State University (Raleigh, NC)  
Supplemental Instructor, Department of Physics (Dr. M.A. Klenin)
- Lead tutorial sessions in physics and applied mathematics; lead review sessions for exams
- May 1998 - August 2000* North Carolina State University (Raleigh, NC)  
Tutor - Physics Tutorial Center (Ms. E.A. Rieg)
- Lead tutorial sessions in the walk-in educational assistance center

→ **PUBLICATIONS**

Virginia L. Lockamy. *The Search for the Mechanism of Nitric Oxide Release in Hydroxyurea Therapy*. Doctoral Dissertation. Wake Forest University Graduate School of Arts & Sciences, Dept. of Physics. (2004) Advisors: Dr. D. B. Kim-Shapiro (*Physics*), Dr. S. B. King (*Chemistry*).

PERSONAL INFORMATION WAS REMOVED  
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Virginia L. Lockamy, Howard Shields, Daniel B. Kim-Shapiro, and S. Bruce King. *Iron nitrosyl hemoglobin formation due to the reactions of hydroxylamine and hemoglobin under physiological conditions.* Biochimica et Biophysica Acta, 1674(3):260-267, 2001.

Virginia L. Lockamy, Jiming Huang, Howard Shields, Samir K. Ballas, S. Bruce King, and Daniel B. Kim-Shapiro. *Urease enhances the formation of iron nitrosyl hemoglobin in the presence of hydroxyurea.* Biochimica et Biophysica Acta, 1622(2):109-116, 2003.

Xiuli Xu, Virginia L. Lockamy, Kejing Chen, Zhi Huang, Howard Shields, S. Bruce King, Samir K. Ballas, James S. Nichols, Mark T. Gladwin, Constance T. Noguchi, Alan N. Schechter, and Daniel B. Kim-Shapiro. *Effects of Iron Nitrosylation on Sickle Cell Hemoglobin Solubility.* The Journal of Biological Chemistry, 277(39):36787-36792, 2002.

Virginia L. Lockamy, Jiming Huang, Mamudu Yakubu, Howard Shields, Samir K. Ballas, S. Bruce King, and Daniel B. Kim-Shapiro. "The search for the mechanism of NO release in hydroxyurea therapy." Meeting of the Biophysical Society, Baltimore, MD, 14-18.

Virginia L. Lockamy, Jiming Huang, Howard Shields, Fouad Azizi, Samir K. Ballas, S. Bruce King, and Daniel B. Kim-Shapiro. "In search of the physiologically relevant mechanism for NO release in hydroxyurea therapy." Meeting of the Biophysical Society, San Antonio, TX, 3-5 March 2003. Biophysical Journal, 84(2):34A, Feb 2003.

Jiming Huang, Virginia L. Lockamy, Daniel B. Kim-Shapiro, and S. Bruce King. "Comparison of nitrite and nitrate production from hydroxyurea upon treatment with various biological oxidants." Oxygen Society Meeting, San Antonio, TX, Nov. 2002. Free Radical Biology and Medicine, 33:224 Suppl. 2, 2002.

Daniel B. Kim-Shapiro, Xiuli Xu, Virginia L. Lockamy, Kejing Chen, Howard Shields, S. Bruce King, Samir K. Ballas, James S. Nichols, Margaret E. Pease-Fye, Mark T. Gladwin, Constance T. Noguchi, and Alan N. Schechter. "Inhibition of Sickle Hemoglobin Polymerization by Nitric Oxide." National Sickle Cell Disease Program meeting, Washington DC, Sept. 2002.

Fouad Azizi, Virginia L. Lockamy, Rupen Amin, Brian Cinc, Erin Lichtenstein, Samir K. Ballas, S. Bruce King, and Daniel B. Kim-Shapiro. "Effects of NO and NO-producing compounds on sickle hemoglobin polymerization." Meeting of the Biophysical Society, San Francisco, CA, 23-27 February 2002. Biophysical Journal, 82(1):2163 Part 2, Jan. 2002.

#### PROFESSIONAL MEMBERSHIPS

July 2007 Private inspector for therapy & shielding design (state of VA)  
License Number: RH-25-07-295

August 2006 Passed Part I of ABR exam

➤ Currently registered to take Part II of ABR exam in August 2007

2004 - Present American Association of Physicists in Medicine

2001 - 2004 Biophysical Society

1998 - Present Sigma Pi Sigma

1998 - 2000 Pi Mu Epsilon

➤ President of North Carolina State chapter

#### OBJECTIVES OF RESEARCH

-To study effects of NO-producing compounds (hydroxyurea and hydroxylamine) on blood and hemoglobin

-To investigate the in vivo mechanism of formation of iron-nitrosylated hemoglobin (HbNO)

-To determine reaction kinetics for deoxyhemoglobin (deoxyHb), oxyhemoglobin (oxyHb), and methemoglobin (metHb) with hydroxylamine

-To determine reaction kinetics for metHb with hydroxyurea (HU)

-To study the kinetics of formation of methemoglobin (metHb) and iron-nitrosylated hemoglobin

-To test the blood of patients with sickle cell disease for the hydrolysis of hydroxyurea to hydroxylamine

#### COMMUNITY ACTIVITIES

2004 - 2005 Tutor in Physics, Medical Physics

2003 - 2004 Graduate Liaison to the Physics Program Review Committee, WFU

2002 - 2004 Physics Representative; Graduate Student Association, WFU

2002 - 2003 Volunteer; Crisis Control Ministry (Winston-Salem, NC)

1998 - 2000 Youth Counselor; Edenton Street UMC (Raleigh, NC)

1996 - 2000 Tutor in Physics, Mathematics

### ➔ SPECIALTY CERTIFICATIONS

*June 2006* Eclipse Administration & Physics Training (Las Vegas, NV)  
Eclipse IMRT Administration & Physics Training (Las Vegas, NV)  
*March 2006* CPR Training/Accreditation  
*August 2001* Human Participants Protection Education for Research Teams  
Sponsored by the National Institutes of Health  
*July 2004* CPR Training/Accreditation  
*July 2004* IIRPAA Training

### ➔ LABORATORY SKILLS

Electron Paramagnetic Resonance (EPR) Spectroscopy; Absorption Spectroscopy (Reaction Kinetics, Scanning Kinetics, Concentration Measurements); Nitric Oxide Analyzer (Chemiluminescence); Distillation; Centrifugation; Paper Chromatography; Blood/Hemoglobin Fractionation and Preparation; Vacuum Systems (Blood De-gassing); High Performance Liquid Chromatography; Column Fractionation; Buffer Preparation and Titration

### ➔ COMPUTER SKILLS

Microsoft Office (Word, Excel, Powerpoint); Maple; Matlab; C++ Computer Language; Internet Reference/Citation Searches; Fortran 77/90; Pinnacle/ADAC; Eclipse; CMS XiO; Xknife; Brachyvision; Theraplan; Plato; MU Check; RadCalc; MapCheck; Fixer; ImageFusion; TLD Software; GE Advantage Sim; VARIs; IMPAC; RIT Software

### ➔ CLINICAL SKILLS

3-D conformal and non-conformal treatment planning (Pinnacle/ADAC, Eclipse, CMS XiO); IMRT planning (Pinnacle, Eclipse, CMS XiO); IMRT commissioning (Eclipse); Tomotherapy - treatment planning and QA; VARIs; IMPAC; Electronic charting; Digitizing blocks, contours (Pinnacle, Eclipse, CMS XiO); Block planning & construction; Compensator construction; IMRT QA (film & chamber measurements, MapCheck), Photon & electron therapy treatment planning; Total skin electron therapy (dose verification using TLD and boost planning); Total body irradiation (Right/Left Lateral Technique); Fanconi Anemia treatment (AP/PA technique) - calculation & compensator design; Stereotactic Radiosurgery (planning X-knife, treatment, CT- and/or MRI-based imaging); Stereotactic commissioning (Xknife 4); Linac Isocentric accuracy; Stereotactic accuracy; High Dose Rate Brachytherapy (HDR) - QA (monthly/daily), planning (GYN, Head and Neck, Mammosite, Extremities) & treatment; Low Dose Rate Brachytherapy (LDR) - iridium and cesium - ovoid, tandem, syed planning and treatment; seed/ribbon calibration; loading/unloading radioactive sources; Eye Plaque (Iodine-125) - treatment calculation, seed calibration, plaque loading; Iodine-131 calibration & dosing for thyroid treatment; Palladium-103 calibration & implant; Samarium calibration & dosing; GM meter or ion chamber meter surveying; In-vivo dosimetry; TLD (powder & chip); Diode measurements; Linac monthly and annual QA (both TG-21 & TG-51); Simulator QA; CT QA; CT-Sim QA; CT-Sim commissioning; MLC QA (80- and 120-leaf systems); Orthovoltage calibration; General treatment planning; Monitor unit calculations (RadCalc & MU Check); Electron cutout measurements (film & ion chamber); BAT QA/operation; Wellhofer scanner (film analysis & QA); Craniospinal treatment planning; Anatomical contouring; Classroom and clinical instruction; Linacs: Varian 2100C, Varian 2100C/D, Varian 2100 EX, Varian 2100 SC, Tomotherapy; Simulators/CT-Sim: Nucletron conventional simulator, Varian conventional simulator, GE-CT Sim (Advantage Sim software); HDR units: Nucletron and Gammamed



### ➔ ACTIVITIES DURING RESIDENCY

#### Courses

- TRAD 7170 Basic Radiological Physics
- TRAD 7173 Physics of Radiation Therapy
- RTT 3581 Principles & Practices of Radiation Therapy I
- RTT 4581 Principles & Practices of Radiation Therapy II

#### Treatment Equipment (Teletherapy)

- Calibration - calibration according to protocol, acceptance testing, commissioning, beam data input into the computer, verification of

- computer isodose distributions, surface doses, buildup dose distributions, determination of parameters for monitor set calculations
- Radiation Protection – head leakage, neutron contamination, area survey, design specifications, facility design
- Quality assurance – daily, weekly, monthly, & annual checks
- Simulator/CT Scanner
  - Testing – acceptance testing & commissioning
  - Radiation Protection – beam quality, head leakage, & area survey
  - Quality assurance – mechanical, radiation, fluoroscopic, & processor
- Dosimetric Equipment
  - Ion chambers – use of Farmer Chamber, plane parallel chamber, survey meter (calibration & use), radiation field scanner (water phantom)
  - TLD – annealing procedures, calibration, use of capsules, chips, in vivo dosimetry
  - Film – film dosimetry for electrons & photons, sensitometric curve, & film badges
  - Quality assurance – chamber calibration & intercomparisons, TLD quality control, & survey meter calibration checks
- Treatment Planning
  - Equipment – acceptance testing & commissioning of treatment planning computer, digitizer, plotter & other auxiliary devices
  - Software – check of computer algorithms for isodose generation, blocking, inhomogeneity & other benchmark tests
  - Imaging – check of CT & MRI images for accuracy of contour delineation, magnifications; CT numbers vs. electron density curve
  - Quality assurance – point dose verification by manual calculation
- Treatment Aids
  - Field Shaping – Custom blocking, multileaf collimators, half-value thickness blocks, gonadal shields, eye shields, & internal shields with electrons
  - Bolus – material & thickness
  - Compensators – design of missing tissue compensators & dosimetry check
  - In vivo Dosimetry – use of TLD chips, diodes
  - Patient Positioning – immobilization devices, body position, leveling, & anatomic landmarks
  - On-line Imaging – verification of portal images in comparison with simulation images
- Special Techniques
  - TBI – establishing dosimetry protocol for total body irradiation technique including dose calculation formalism, compensation & dosimetric verification
  - TSI – establishing total skin irradiation technique including treatment parameters, dosimetry & in vivo checks
- Stereotactic Radiosurgery
  - Specifications – acceptance testing & commissioning of radiosurgery apparatus, beam data acquisition for small fields, data input into the treatment planning computer, & testing of dose calculation algorithm by head-phantom dosimetry
  - Treatment Planning – acquisition of CT, MRI, angiographics data; planning of isodose distributions in 3-D, plan evaluation, generation of treatment parameters
  - Quality assurance – QA checks before each case
- Patient Dose Calculations
  - Dosimetric Quantities – percent depth dose, TPR, TMR, TAR, etc. & their relationship
  - Monitor Unit Calculation – calculations for different treatment conditions & techniques, verification of calculation formalism using bench mark problems
- Brachytherapy
  - Calibration – acceptance testing & commissioning of brachytherapy applicators & HDR source

- Source Preparation – preparation of sources & applicators for implantation
- Radiation Protection – radiation surveys, leak testing & other requirements of regulatory agencies
- Treatment Planning – computer isodose distributions, check of dose calculation algorithm, implant system rules & dose specification
- NRC Mandated Quality Management Program – detailed review of QMP document, implementation & audit

#### Quality Assurance Program

- Design or review of physical quality assurance program for the department, including the NRC mandated Quality Management Program, AAPM Report (TG-40), JCAHO guidelines, etc.

#### Special Reports

- Theory & operation of: radiation detectors, ion chambers/triaxial cables/electrometer, thermoluminescent dosimeters (TLD), film (XV2, EDR2), diodes
- Calibration of: superficial x-ray unit, orthovoltage x-ray unit, megavoltage x-ray & electron beam unit
- Acceptance testing & commissioning of: simulator, linear accelerator, & treatment planning computer

#### ➤ REFERENCES

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*References available upon request*

NRC FORM 313A (AMP)  
(10-2006)

U.S. NUCLEAR REGULATORY COMMISSION

**AUTHORIZED MEDICAL PHYSICIST TRAINING AND EXPERIENCE  
AND PRECEPTOR ATTESTATION  
[10 CFR 35.51]**

APPROVED BY OMB: NO. 3150-0120  
EXPIRES: 10/31/2008

Name of Proposed Authorized Medical Physicist

Virginia L. Lockamy

Requested  
Authorization(s)  
(check all that apply)

- 35.400 Ophthalmic use of strontium-90
- 35.600 Teletherapy unit(s)
- 35.600 Remote afterloader unit(s)
- 35.600 Gamma stereotactic radiosurgery unit(s)

**PART I -- TRAINING AND EXPERIENCE**  
(Select one of the three methods below)

\*Training and Experience, including Board Certification, must have been obtained within the 7 years preceding the date of application or the individual must have obtained related continuing education and experience since the required training and experience was completed. Provide dates, duration, and description of continuing education and experience related to the uses checked above.

- 1. **Board Certification**
  - a. Provide a copy of the board certification.
  - b. Go to the table in 3.c. and describe training provider and dates of training for each type of use for which authorization is sought.
  - c. Skip to and complete Part II Preceptor Attestation.
- 2. **Current Authorized Medical Physicist Seeking Additional Authorization for use(s) checked above**
  - a. Go to the table in section 3.c. to document training for new device.
  - b. Skip to and complete Part II Preceptor Attestation
- 3. **Education, Training, and Experience for Proposed Authorized Medical Physicist**
  - a. Education: Document master's or doctor's degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university.

Degree	PhD	Major Field	Physics
College or University	Wake Forest University, N.C.		

b. Supervised Full-Time Medical Physics Training and Work Experience in clinical radiation facilities that provide high-energy external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services.

Yes. Completed 1 year of full-time training in medical physics (for areas identified below) under the supervision of \_\_\_\_\_ who meets the requirements for an Authorized Medical Physicist.

**AND**

Yes. Completed 1 year of full-time work experience in medical physics (for areas identified below) under the supervision of Alexander Gray who meets the requirements for an Authorized Medical Physicist.

NRC FORM 313A (AMP)  
(10-2006)

U.S. NUCLEAR REGULATORY COMMISSION

**AUTHORIZED MEDICAL PHYSICIST TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)**

**3. Education, Training, and Experience for Proposed Authorized Medical Physicist (continued)**

**b. Supervised Full-Time Medical Physics Training and Work Experience (continued)**

*If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.*

Description of Training/ Experience	Location of Training/License or Permit Number of Training Facility/Medical Devices Used+	Dates of Training*	Dates of Work Experience*
Medical Physics	SNGH, Norfolk, VA 45-00131-02		Dec 06- present
Performing sealed source leak tests and inventories	SNGH		"
Performing decay corrections	SNGH		"
Performing full calibration and periodic spot checks of external beam treatment unit(s)	SNGH		"
Performing full calibration and periodic spot checks of stereotactic radiosurgery unit(s)	NA		"
Performing full calibration and periodic spot checks of remote afterloading unit(s)	SNGH		"
Conducting radiation surveys around external beam treatment unit(s), stereotactic radiosurgery unit(s), remote after loading unit(s)	SNGH		"

Supervising Individual\*\*

Alex Gray

License/Permit Number listing supervising individual as an authorized Medical Physicist

45-00131-02

for the following types of use:

- Remote afterloader unit(s)       Teletherapy unit(s)       Gamma stereotactic radiosurgery unit(s)

+ Training and work experience must be conducted in clinical radiation facilities that provide high-energy external beam therapy (photons and electrons with energies greater than or equal to 1 million electron volts) and brachytherapy services.

\* 1 year of Full-time medical physics training and 1 year of full time work experience cannot be concurrent.

\*\* If the supervising medical physicist is not an authorized medical physicist, the licensee must submit evidence that the supervising medical physicist meets the training and experience requirements in 10 CFR 35.51 and 35.59 for the types of use for which the individual is seeking authorization.



NRC FORM 313A (AMP)  
(10-2006)

U.S. NUCLEAR REGULATORY COMMISSION

**AUTHORIZED MEDICAL PHYSICIST TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)**

**3. Education, Training, and Experience for Proposed Authorized Medical Physicist (continued)**

c. Describe training provider and dates of training for each type of use for which authorization is sought.

Description of Training	Training Provider and Dates		
	Remote Afterloader	Teletherapy	Gamma Stereotactic Radiosurgery
Hands-on device operation	SNGH Dec 2006 - present	X	X
Safety procedures for the device use	"		
Clinical use of the device	"		
Treatment planning system operation	"		

Supervising Individual

If training is provided by Supervising Medical Physicist. (If more than one supervising individual is necessary to document supervised training, provide multiple copies of this page.)

Alexander Gray

License/Permit Number listing supervising individual as an authorized Medical Physicist

45-00131-02

for the following types of use:

Remote afterloader unit(s)

Teletherapy unit(s)

Gamma stereotactic radiosurgery unit(s)

If Applicable:

Authorization Sought	Device	Training Provided By	Dates of Training
35.400 Ophthalmic Use of strontium-90		NA	

d. Skip to and complete Part II Preceptor Attestation.

NRC FORM 313A (AMP)  
(10-2006)

U.S. NUCLEAR REGULATORY COMMISSION

**AUTHORIZED MEDICAL PHYSICIST TRAINING AND EXPERIENCE AND PRECEPTOR ATTESTATION (continued)**

**PART II - PRECEPTOR ATTESTATION**

Note: This part must be completed by the individual's preceptor. The preceptor does not have to be the supervising individual as long as the preceptor provides, directs, or verifies training and experience required. If more than one preceptor is necessary to document experience, obtain a separate preceptor statement from each.

**First Section**

Check one of the following:

**1. Board Certification**

I attest that \_\_\_\_\_ has satisfactorily completed the requirements in  
Name of Proposed Authorized Medical Physicist  
10 CFR 35.51(a)(1) and (a)(2).

**OR**

**2. Education, Training, and Experience**

I attest that Virginia Lockamy has satisfactorily completed the 1-year of full-time  
Name of Proposed Authorized Medical Physicist  
training in medical physics and an additional ~~year~~ of full-time work experience as required by 10 CFR  
35.51(b)(1). 8 months

**AND**

**Second Section**

Complete the following:

I attest that Virginia Lockamy has training for the types of use for which authorization  
Name of Proposed Authorized Medical Physicist  
is sought that include hands-on device operation, safety procedures, clinical use, and the operation of a  
treatment planning system.

**AND**

**Third Section**

Complete the following:

I attest that Virginia Lockamy has achieved a level of competency sufficient to  
Name of Proposed Authorized Medical Physicist  
function independently as an Authorized Medical Physicist for the following:

- 35.400 Ophthalmic use of strontium-90       35.600 Teletherapy unit(s)
- 35.600 Remote afterloader unit(s)       35.600 Gamma stereotactic radiosurgery unit(s)

**AND**

**Fourth Section**

Complete the following for preceptor attestation and signature:

I meet the requirements in 10 CFR 35.51, or equivalent Agreement State requirements for Authorized  
Medical Physicist for the following:

- 35.400 Ophthalmic use of strontium-90       35.600 Teletherapy unit(s)
- 35.600 Remote afterloader unit(s)       35.600 Gamma stereotactic radiosurgery unit(s)

Name of Preceptor <u>Alexander S. Gray</u>	Signature <u>Alexander S. Gray</u>	Telephone Number <u>757-388-2570</u>	Date <u>8/20/07</u>
License/Permit Number/Facility Name <u>45-00131-02 SNGH</u>			