

THE CLEVELAND CLINIC FOUNDATION

9500 Euclid Avenue Cleveland, Ohio 44106 U.S.A.

Ms. Patty Whiston
U.S. NUCLEAR REGULATORY COMMISSION, Region III
Material Licensing Branch
799 Roosevelt Road
Glen Ellyn, Illinois 60137

CONTROL NUMBER 82816
July 28, 1987

Dear Ms. Whiston:

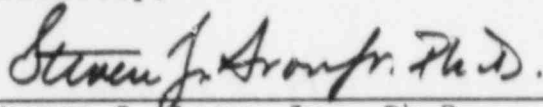
As discussed with you today, please include the following as part of our January 15, 1987 request to amend our NRC license, number 34-00466-02:

Please amend Item 9 to read:

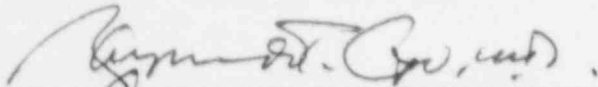
Item 9. One source to be used in an AECL Theratron 780 teletherapy unit for the treatment of humans and for irradiation of biological specimens, animals and inanimate objects, excluding explosives and highly flammable materials. One source in its shipping container to be in possession of the licensee as necessary to the replacement of the source in the teletherapy unit only.

Please don't hesitate to call me at (216) 444-6645 if you should have any questions.

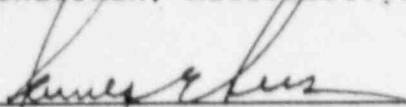
Sincerely,



Steven J. Aron, Jr., Ph.D.
Radiation Safety Officer



Raymundo T. Go, M.D.
Chairman, Radioisotope and Radiation Safety Committee



James E. Lees
Director of Operations

cc: Signatories

8801280204 870810
REG3 LIC30
34-00466-02 PDR

RECEIVED

JUL 30 1987

REGION III

JUL 30 1987

CONVERSATION RECORD

TIME

9:30A

DATE

7/28/87

TYPE

☐ VISIT☐ CONFERENCE☒ TELEPHONE☐ INCOMING☒ OUTGOING

ROUTING

NAME/SYMBOL

INT

Location of Visit/Conference:

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU

ORGANIZATION (Office, dept., bureau, etc.)

TELEPHONE NO.

Steven Aron, B.S.D.

Cleveland Clinic

(216) 444-1645

SUBJECT

Amendment request dated 1/15/87

Sec No. 34-00466-02 CN 82816

SUMMARY

I called to clarify request for addition of uses (non-human use) on human use license -02. I told Dr. Aron that it does not appear that we need to amend -02 license since it doesn't authorize any non-human use.

Dr. Aron stated they would like to add non-human use to their authorization in Item 9.A of Sec. No. 34-00466-02.

I requested they submit supporting documentation which describes intended non-human use of co-60 unit as addl. info.
Refer to CN 82816
Respond w/in 30d.

ACTION REQUIRED

NAME OF PERSON DOCUMENTING CONVERSATION

SIGNATURE

DATE

P.J. Winton

7/28/87

ACTION TAKEN

SIGNATURE

TITLE

DATE

THE CLEVELAND CLINIC FOUNDATION

9500 Euclid Avenue Cleveland, Ohio 44106 U.S.A.

Steven J. Aron, Jr., Ph.D.
Radiation Safety
216/444-6645

U.S. Nuclear Regulatory Commission - Region III
Materials Licensing Branch
799 Roosevelt Road
Glen Ellyn, Illinois 60137

January 15, 1987

Gentlemen:

Enclosed are two checks for \$230.00 (each) to amend the Cleveland Clinic Foundation's NRC teletherapy licenses, number 34-00466-02 and number 34-00466-03, each as follows:

- 12.A. Licensed material shall be used by, or under the supervision of, physicians who are certified by the American Board of Radiology in Radiology or Therapeutic Radiology and who have been approved by the Cleveland Clinic Foundation's Radioisotope Committee.
- 12.B. Licensed material for non-human use shall be used by or under the supervision of Patrick Higgins, Ph.D., Claudio Sibata, Ph.D., William McCarthy, M.S., James Blue, Ph.D., or William Roberts, M.S.
- 12.C. The Radiation Safety Officer for the activities authorized by this license is Steven J. Aron, Jr., Ph.D.

Attached are curriculum vitae for Patrick Higgins, Ph.D., Claudio Sibata, Ph.D. and William McCarthy, M.S.

Should you have any questions regarding this request, please don't hesitate to call me at (216) 444-6645.

34-00394

RECEIVED
JAN 27 1987

Log	Jan 17
Remitter	
Check No.	574637
Amount	\$230
Fee Category	7A
Type of Fee	Amend
Date Check Rec'd.	
Date Completed	2/5/87
By:	SA

CONTROL NO. 82816

RECEIVED

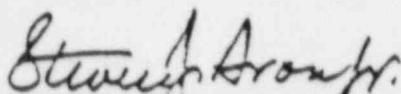
JAN 21 1987

REGION III

880/110/10

Page 2
License Amendment
January 15, 1987

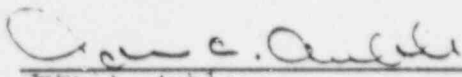
Sincerely,



Steven J. Aron, Jr., Ph.D.
Radiation Safety Officer



Raymundo T. Go, M.D.
Chairman, Radioisotope Committee



John A. Auble
Secretary and General Counsel

Attachments:

1. Two checks for \$230.00 (each).
2. Curriculum Vitae for Patrick Higgins, Ph.D., Claudio Sibata, Ph.D. and William McCarthy, M.S.

CONTROL NO. 82816

THE CLEVELAND CLINIC
FOUNDATION
9500 Euclid Avenue, Cleveland, Ohio 44106



REMITTANCE STATEMENT

No. 57463

MEMO	CCF P.O. NO.	INVOICE DATE	INVOICE NUMBER	GROSS AMOUNT	DISCOUNT DEBIT MEMO	NET AMOUNT
AMENDING CCF NRC LICENSE # 34-00466-02		1-8-87				230.00
TOTALS →						230.00

THE CLEVELAND CLINIC
FOUNDATION
9500 Euclid Avenue, Cleveland, Ohio 44106



No. 57463

DATE 1-19-87

CHECK
NUMBER

The sum of 230 dollars 00 cents

PAY TO THE ORDER OF

AMOUNT \$230.00

U.S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSING BRANCH
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

THE CLEVELAND CLINIC FOUNDATION

AMERITRUST
4366 MAIN AVE
ASHTABULA, OH
44004

VOID AFTER 90 DAYS

⑈574637⑈ 1:04 1 20 1 7031:7 1 505 ⑈8528⑈

THE CLEVELAND CLINIC
FOUNDATION



9500 Euclid Avenue, Cleveland, Ohio 44106

REMITTANCE STATEMENT

No. 574638

MEMO	CCF P.O. NO.	INVOICE DATE	INVOICE NUMBER	GROSS AMOUNT	DISCOUNT DEBIT MEMO	NET AMOUNT
AMENDING CCF NRC LICENSE #34-00466-03		1-8-87				230.00
TOTALS →						230.00

CHECK
NUMBER

TOTALS →

230.00

THE CLEVELAND CLINIC
FOUNDATION



9500 Euclid Avenue, Cleveland, Ohio 44106

No. 574638

DATE 1-19-87

CHECK
NUMBER

The sum of 230 dollars 00 cents

PAY TO THE ORDER OF

AMOUNT \$230.00

AMERITRUST
4066 MAIN AVE.
ASHTABULA, OH
44004

U.S. NUCLEAR REGULATORY COMMISSION
MATERIALS LICENSING BRANCH
799 ROOSEVELT ROAD
GLEN ELLYN, IL 60137

THE CLEVELAND CLINIC FOUNDATION

VOID AFTER 90 DAYS

⑈574638⑈ ⑆041201703171505⑈8526⑈

WILLIAM A. MCCARTHY

31400 Aldrich Drive
Bay Village, Ohio 44140
216-871-7519

- CURRICULUM VITAE -

6/84-Present CLEVELAND CLINIC FOUNDATION

Medical Radiation Physicist. Responsible for planning for Theratron 780 Cobalt machine and Therac 20 linear accelerator, as well as brachytherapy. Instruct and supervise dosimetrist trainee. Responsible for physics instruction of students in the Radiotherapy Technologist Training Program. Utilize various dosimetry systems, GE and ADAC treatment planning computers and a Harshaw TLD system. Implement TG-21 protocol.

4/83-6/84 USVA Medical Center

Physicist, Radiology. Responsible for quality assurance of Linac and Orthovoltage therapy machines, computerized treatment planning and dosimetry, the diagnostic X-ray QA program and radiation safety for the Radiology Department. Utilized CMS treatment planning computer, Teledyne TLD system and various health physics and diagnostic QA instruments and devices.

3/82-4/83 Contemporary Science Inc.

Represented several companies in product areas including nuclear pulse height analyzers, radiological treatment planning, dosimetry, x-ray QA, x-ray diffraction and isotope calibrators.

5/81-3/82

Harshaw Chemical Company

Responsible for the technical and business development of the company's medical system, low background counting system and thermoluminescent dosimetry product lines.

1957-81

Victoreen Inc.

Achieved the rank of Vice President. Directed the market development and engineering functions.

1950-57

Tracerlab Inc.

Responsible for the health physics aspects and installation of the company's industrial nuclear gauges. Then took responsibility for the company's medical, research and industrial products in the Midwest.

1947-50

Medical Nuclear Research Project, Case Western
Reserve University

Responsible for counting lab, nuclear waste disposal and health physics monitoring, in addition to research duties.

SOME ACCOMPLISHMENTS

- . Dosimetry Calibration Laboratory. Directed the establishment of a new calibration laboratory at Victoreen to meet the expectations of the medical physics community for more accurate and better assured calibrations. Met my goals of AAPM accreditation as well as profitability. In fact, this was the first commercial calibration laboratory to be accredited by the AAPM.
- . Research. Designed the first clinically successful Sr-90 beta ray eye applicator and then a parallel plate extrapolation ionization chamber to measure its output.
- . Criterion for AAPM Accreditation. Found the AAPM accreditation process for dosimetry calibration labs to be somewhat arbitrary. Was appointed by a task group of the therapy committee to prepare a formal criterion for accreditation. Drafted the document used officially by the AAPM in conjunction with the NBS to accredit (or conversely to discontinue accreditation of) a dosimetry calibration lab.
- . Administration. Analyzed the VA hospital's long-term radiotherapy patient load trends in the light of the "Radiology Blue Book" as well as stated Veterans Administration goals. Prepared a five year plan for the orderly expansion of facilities based on appropriately extrapolated long term growth data. Plan adopted for implementation by the Regional Director.
- . International Dosimetry Standard. Served, with Dr. Robert Loevinger of NBS, as the U.S. representative to IEC committee SC 620. We prepared the international standard for medical dosimetry equipment.
- . National Council for Radiation Protection. Appointed to the NCRP ad hoc committee which drafted a policy for the adoption of SI units for the measurement of radioactivity and ionizing radiation in the United States.
- . "Medical Physics" - (the journal of the AAPM).
Founding editor of this journal.

- Dosimetry Equipment. Applied my company's new, more sensitive electrometer technology to the measurement of diagnostic, as well as therapeutic exposure rates. The resultant device (Model 555) contributed strongly to the development of x-ray quality control protocol formulation.
- Diagnostic X-ray QA KVP Meter. Perceived the need for this kind of device to measure KVP on a "non-invasive" basis. Set up a program to choose appropriate detectors, test breadboarded concept, and to plan software and hardware development. The result is the unique device called "Nero".

EDUCATION:

John Carroll University, M.S., Physics and Mathematics, 1977. Dissertation: "The Metrology of Electromagnetic Ionizing Radiation".

John Carroll University, B.S., Physics and Mathematics. Chemistry and Philosophy minors, 1948. Thesis: "The Ion Chamber".

Various short courses on computer programming, MRI imaging Hyperthermia, semiconductor detectors, and finance.

PUBLICATIONS:

"Importance of the Calibration of All the Parameters Affecting Radiation Exposure Measurement"; W. A. McCarthy, Medical Physics, Vol. 2, No 2, Mar. Apr., 1975.

"A Simple Laboratory Setup for Rapid Measurement of Beta Ray Dosages Above 1 rep/sec; J. S. Krohmer and William A. McCarthy, Science, Vol. 113, No. 2935, pages 360-361.

PROFESSIONAL ACTIVITIES:

Member of the American Association of Physicists in Medicine, Health Physics Society of North America, Institute of Electrical and Electronic Engineers, and Cleveland Area Medical Physicists.

3/86

CURRICULUM VITAE

NAME: Patrick D. Higgins, Ph.D.

ADDRESS: Business:
Radiation Therapy Department
Cleveland Clinic Foundation
9500 Euclid Avenue
Cleveland, OH. 44106
PHONE: 216/444-5583

Residence:
7190 Cottesmore Lane
Solon, OH. 44139

DATE OF BIRTH: March 31, 1951
PLACE OF BIRTH: Detroit, Michigan

MARITAL STATUS: Married, October 13, 1979
Wife: Kimberley
Child: Shannon

SOCIAL SECURITY NUMBER: 379-58-7231

EDUCATION: University of Detroit, Detroit, Michigan
Minor - Mathematics and Philosophy;
Major - Physics
B.S. - 1973

University of Notre Dame, Notre Dame, Indiana
High Energy Physics
Ph.D. Advisor: Nripendra Biswas
Dissertation Title: "A Study of Resonance and
Neutral Particle Production in High Energy π -P
Interactions"
Ph.D. - 1978

HONORS: Phi Eta Sigma
Sigma Pi Sigma (physics)
Pi Mu Epsilon (mathematics)
Hugh Smith Scholarship (Detroit)
Sigma Xi

SOCIETIES: American Physical Society
Radiation Research Society

EXPERIENCE:

Sept. 1973-May 1978:

Teaching assistant, University of Notre Dame,
Notre Dame, Indiana

Extensive experimental research in High
Energy Physics was performed at Argonne and
Fermi National Laboratories, including 2
streamer chamber experiments and a number of
experiments utilizing the 12 foot, 15 foot and
30 inch bubble chambers.

May-Aug. 1978:

Member of Technical Staff, Bell Laboratories,
Holmdel, New Jersey.

Participated in the Survey Planning Group:
Performed the statistical design for a quality
control survey to be executed in 1979-80; pro-
grammed data-taking devices for this survey.

Sept. 1978-June 30, 1981:

Postdoctoral Fellow: National Cancer Institute
Grant for Medical Physics and Biology Training,
Division of Medical Physics, Department of Ra-
diology, University of Wisconsin, Madison,
Wisconsin.

Primarily involved in research into
measurement of the microdosimetric proper-
ties of 2.5 and 14.8 MeV neutrons.

Initiated a joint Radiobiology/Medical
Physics program to study the effects of fast
neutron radiation on cellular response.

Acquired and installed a ^{60}Co tele-
therapy unit to further study effects of
non-ionizing radiation for mixed beams of
fast neutrons and ^{60}Co photons.

July 1, 1981-June 30, 1983:

Project Associate: Section of Radiation
Therapy Physics, Division of Radiation
Oncology, Department of Human Oncology,
University of Wisconsin Medical School,
Madison, Wisconsin.

CURRICULUM VITAE

Patrick D. Higgins, Ph.D.

Page 3

July 1, 1983-July 31, 1984:

Assistant Scientist: Departments of Human
Oncology and Medical Physics, University of
Wisconsin Medical School, Madison, Wisconsin.

July 1, 1984-May 30, 1986:

Assistant Professor: Departments of Human
Oncology and Medical Physics, University of
Wisconsin Medical School, Madison, Wisconsin.

June 1, 1986-present:

Director of Radiotherapy Physics
Cleveland Clinic Foundation
Cleveland, OH. 44106

RESEARCH GRANTS:

NIH Grant 1-R23-CA-37057-01A1

Dates: 12/01/84 - 11/30/87

Amount: \$103,375.00

Title: Thermal Modeling for Ultrasound
Hyperthermia. Principle Investigator

University of Wisconsin Graduate School

Grant No.: 151560

Dates: 7/01/85 - 6/30/86

Amount: \$16,967.00

Title: Calorimetry for Synchrotron Radiation
Dosimetry. Principle Investigator

University of Wisconsin Medical School and

Department of Human Oncology

Dates: 2/01/85 - 1/31/86

Amount: \$6,370.00

Title: Study of Normal Porcine Fat and Muscle
Response to Focused Ultrasound Hyperthermia.
Principle Investigator

American Cancer Society Institutional Research
Grant

Dates: 11/01/85 - 10/31/86

Amount: \$2,500.00

Title: Hyperthermia Induction and Tissue Response
in Dogs with Thermally Self-Regulating
Ferromagnetic Implants. Co-Principle
Investigator

CURRICULUM VITAE

Patrick D. Higgins, Ph.D.

Page 4

PUBLICATIONS:

Principal Author:

1. Higgins, P.D., et al: Study of Delta⁺⁺ Production in 100, 100, and 360 GeV/c pi-p Interactions. PHYS. REV. D-19:731, 1979
2. Higgins, P.D., et al: Energy Dependence of Rho(770) Production in 100, 200, and 360 GeV/c pi-p Interactions. PHYS. REV. D-19:65, 1979.
3. Higgins, P.D., et al: Measurement of OER and RBE for Mono-energetic 2.5 and 14.3 MeV Neutrons. INT. J. RADIAT. BIOL. 40:313, 1981.
4. Higgins, P.D., DeLuca, P.M., Gould, M.N., Pearson, D.W.: Survival of V79 Chinese Hamster Cells Following Simultaneous Irradiation by 14.8 MeV Neutrons and ⁶⁰Co. RADIAT. RES. 95:45-56, 1983.
5. Higgins, P.D., Sibata, C.H., Attix, F.H., Paliwal, B.R.: Calculational Methods for Estimating Skin Dose in ⁶⁰Co Beams. MED. PHYS. 10:622, 1983.
6. Higgins, P.D., Zeng, X.-W., Zagzebski, J.A., Paliwal, B.R.: Versatility of Focused Ultrasound in Treatment of Superficial Tumors. INT. J. RADIATION ONCOL. BIOL. PHYS. 10:1923-1931, 1984.
7. Higgins, P.D., DeLuca, P.M., Jr., Gould, M.N.: Effect of Pulsed Dose in Simultaneous and Sequential Irradiation of V79 Cells by 14.8 MeV Neutrons and ⁶⁰Co Photons. RADIAT. RES. 99:591-595, 1984.
8. Higgins, P.D., Sibata, C.H.: Determination of Contamination-Free Build-up for ⁶⁰Co. PHYS. MED. BIOL. 30:153-162, 1985.
9. Higgins, P.D., Jafari, F.: Thermal Distributions in Spherical Regions with Variable Thermal Conductivity. IEEE TRANSACTIONS ON ULTRASONICS, Ferroelectrics and Frequency Control 1:21-26, 1986.
10. Higgins, P.D., Adams, W.M., Siegfried, L., Paliwal, B.R., Steeves, R.A.: Chronic Response of Normal Porcine Fat and Muscle to Focused Ultrasound Hyperthermia. RADIAT. RES. 104:140-152, 1985.
11. Higgins, P.D., Adams, W.M., Dubielzig, R.R.: Thermal Dosimetry of Normal Porcine Tissues. RADIAT. RES. (submitted) 1986.

CURRICULUM VITAE

Patrick D. Higgins, Ph.D.

Page 5

PUBLICATIONS:

Co-Author:

1. Anderson, E.W., et al: Direct e^+e^- Production by 360 GeV/c π in Hydrogen. PHYS. REV. LETT. 37:1593, 1976.
2. Firestone, A., et al: π -P Interactions at 360 GeV/c: Measurement of the Total and Elastic Cross Sections and the Charged Particle Multiplicity Distributions. PHYS. REV. D-14:2902, 1976.
3. Biswas, N.N., et al: Inclusive $\Delta^{++}(1232)$ Production in 200 GeV/c π -p Interactions. PHYS. REV. D-16:2090, 1977.
4. Lamsa, J., et al: The Inelastic Diffractive Dissociation in Cross Section in π^- P Interactions at 200 GeV/c. PHYS. REV. D-18:3933, 1979.
5. Lehman, E., et al: Tests of the Quark-Parton Model in Soft Hadronic Processes. PHYS. REV. D-18:3353, 1978.
6. Biswas, N.N., et al: High- P_T P ion Production in $\pi\pi$ Interactions. PHYS. LETT. 97B:333-336, 1980.
7. DeLuca, P.M., Higgins, P.D., Pearson, D.W., Attix, F.H.: Neutron and Photon Dose Components in a 15 MeV Neutron Beam Determined with a Granite-walled Proportional Counter. Seventh Symposium on Microdosimetry, Vol. II, edited by J. Booz, H.A. Ebert and H.D. Hartfiel, Harwood Academic Publ., 1980.
8. DeLuca, P.M., Schell, M.C., Pearson, D.W., Higgins, P.D., Attix, F.H.: Performance Characteristics of Al50 Plastic-Equivalent Gases in Al50 Plastic Proportional Counters for 14.8 MeV Neutrons. MED. PHYS. 11, 449-455, 1984.

CURRICULUM VITAE

Patrick D. Higgins, Ph.D.

Page 6

DEPARTMENT OF ENERGY REPORTS:

1. DeLuca, P.M., Higgins, P.D., Pearson, D.W., Attix, F.H.: Application of a Graphite-walled Proportional Counter for Determining Photon and Neutron Dose Fractions in a 15 MeV Neutron Beam. DOE-COO-1105-267, 1979.
2. Higgins, P.D., DeLuca, P.M., Gould, M.N., Pearson, D.W.: Correlation of Cellular Response with Event Size. DOE-EV-01105-276, 1980.
3. Brandan, M.E., DeLuca, P.M., Pearson, D.W., Higgins, P.D.: LET Distributions from Fast Neutron Irradiation of TE-Plastic and Graphite Measured in a Cylindrically Symmetric Geometry. DOE-EV-01105-274, 1980.
4. DeLuca, P.M., Higgins, P.D., Pearson, D.W., Attix, F.H.: Comparison of Photon Doses Determined with a Graphite-walled Proportional Counter with Paired Dosimeters Irradiated by 14.8 MeV Neutrons. DOE-EV-01105-272, 1980.
5. Higgins, P.D., DeLuca, P.M., Pearson, D.W., Gould, M.N.: V79 Survival Following Simultaneous or Sequential Irradiation by 14.8 MeV Neutrons and ^{60}Co Photons. DOE-EV-01105-282, 1981.
6. Higgins, P.D., DeLuca, P.M., Pearson, D.W., Gould, M.N.: A Semi-Phenomenological Method for Applying Microdosimetry in Estimating Biological Response. DOE-EV-01105-283, 1981.
7. DeLuca, P.M., Higgins, P.D., Pearson, D.W., Schell, M.C., Attix, F.H.: Application of Al50-Plastic Equivalent Gases in Microdosimetric Measurements. DOE-EV-01105-284, 1981.
8. DeLuca, P.M., Higgins, P.D., Schell, M.D., Pearson, D.W.: Fast Neutron and Photon Doses Determined with Proportional Counters and an Ionization Chamber. DOE-EV-01105-285, 1981.

CURRICULUM VITAE

Patrick D. Higgins, Ph.D.

Page 7

MEETINGS:

A. Papers Presented:

1. DeLuca, P.M., Higgins, P.D.: A Multiport Wide Dynamic Range Data Acquisition Channel for LET Spectra. 21st Annual American Association of Physicists in Medicine, July 1979. MED. PHYS. 6:355, 1979.
2. DeLuca, P.M., Higgins, P.D., Pearson, D.W., Attix, F.H.: Neutron and Photon Dose Components in a 15 MeV Neutron Beam Determined with a Graphite-walled Proportional Counter. RADIOLOGY 133:249, 1979.
3. DeLuca, P.M., Attix, F. H., Pearson, D.W., Higgins, P.D., Schell, M., Awschalom, M.: Development of an Al₂O₃-Plastic Equivalent Gas for Ionization Chamber and Microdosimetric Measurements of 14.8 MeV Neutron Doses. 4th Symposium on Neutron Dosimetry, Munich, Germany, 1981.
4. Higgins, P.D., DeLuca, P.M., Pearson, D. W., Gould, M. N.: A Measurement of the Relative Biological Effect and Oxygen Enhancement Ratio for a Beam of 15 MeV Neutrons with V79 Cells. Works in Progress - Radiological Society of North America, Nov., RADIOLOGY 133:2491, 1979.
5. Higgins, P.D., DeLuca, P.M., Pearson, D.W., Gould, M.N.: Measurement of the RBE and OER for 2.5 and 14.3 MeV Mono-energetic Neutrons. RADIAT. RES. 83:470, 1980.
6. DeLuca, P.M., Higgins, P.D., Pearson, D. W., Attix, F.H.: A Tandem Irradiation Fast-Neutron and ⁶⁰Co Source Facility. 4th Symposium on Neutron Dosimetry, Munich, Germany, 1981.
7. Higgins, P.D., DeLuca, P.M., Pearson, D. W., Gould, M. N.: Survival of V-79 Cells Following Simultaneous Irradiation by 14.8 MeV Neutrons and ⁶⁰Co Photons. RADIAT. RES. 87:410, 1981.
8. Higgins, P.D., Zagzebski, J.A., Madsen, E.L., Paliwal, B.R., Felmlee, J.: Focused Ultrasound Hyperthermia: Modelling and Measurement. MED. PHYS. 9:604, 1982.
9. Higgins, P.D., Sibata, C., Attix, F.H.: Calculation and Measurement Techniques for Estimating Electron Contamination in ⁶⁰Co Photon Beams. MED. PHYS. 9:804, 1982.

CURRICULUM VITAE

Patrick D. Higgins, Ph.D.

Page 8

A. Papers Presented: (contd.)

10. Paliwal, B.R., Higgins, P.D., Madsen, E.L., Zagzebski, J.A.: Simulation of Blood Flow Effects in Hyperthermia Application. MED. PHYS. 9:601, 1982.
11. Higgins, P.D., Zeng, X.W., Zagzebski, J.A., Paliwal, B.R., Steeves, R. A.: Demonstration of the Versatility of Focused Ultrasound Hyperthermia in Treatment of Superficial Lesions. RADIAT. RES. 1983.
12. Paliwal, B.R., Higgins, P.D., Steeves, R. A.: Thermal Distribution Studies with a Dynamic Phantom. 31st Radiation Research Society Meeting, San Antonio, TX., 1983.
13. Blacher, S.E., Fleming, P.A., Bak, M., Thomadsen, B.R., Higgins, P.D., Battaglia, D.G.: Description of an Afterloading Ir-192 Interstitial Implant Technique for the Treatment of Advanced Carcinoma of the Pyriform Sinus. Endocurietherapy Meeting, 1984.
14. Fleming, P., Buchler, D., Higgins, P.D., Bak, M., Thomadsen, B.R.: Cumulative Radiation Effect (CRE) as a Potential Guide in the Management of Advanced Carcinoma of the Vulva. Endocurietherapy Meeting, 1984.
15. Higgins, P.D., Jafari, F., Paliwal, B.R., Steeves, R.A.: Thermal Modeling for Ultrasound Hyperthermia in Spherical Geometry. 32nd Radiation Research Society Meeting, Orlando, Florida, 1984.
16. Higgins, P.D., Adams, C., Siegfried, L., Paliwal, B.R., Steeves, R.A.: Chronic Normal Porcine Tissue Response to Hyperthermia Produced by Annular Focused Ultrasound. 32nd Radiation Research Society Meeting, Orlando, Florida, 1984.
17. Higgins, P.D.: Effects of Simultaneous vs. Sequential Mixtures of 15 MeV Neutrons and ⁶⁰Co Photons on V79 Chinese Hamster Cell Survival. 2nd International Conference on Time, Dose and Fractionation in Radiation Oncology. Madison, Wisconsin, Sept. 12-14, 1984.
18. Higgins, P.D.: Evaluation of Acoustic Applicators. Invited Symposium: 33rd Radiation Research Society Meeting, Los Angeles, California, 1985.
19. Higgins, P.D.: Use of the Thermal Dillutation Technique to Quantify Effective Conductivity Distributions for Thermal Modeling, MED. PHYS. 13:568, 1986.
20. Beddar, A.S., Higgins, P.D.: Use of Ferroelectric Crystal Detector for Electron Dosimetry, MED. PHYS. 13:606, 1986.
21. Thomason, C., Higgins, P.D.: Comparative Dosimetry of Ir-192 and Cs-137 Seed Sources, MED. PHYS. 13:595, 1986

October/1985

CURRICULUM VITAE

NAME: Claudio H. Shibata, PhD
Research Associate

ADDRESS: UW Hospital & Clinics
Department of Radiotherapy,
600 Highland Ave R47B100
Madison, Wisconsin 53792

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SOCIAL SECURITY No.: 398-84-8094

DATE OF BIRTH: September 15, 1932

CITIZENSHIP: Brazilian

MARITAL STATUS: Married

CHILDREN: One

EDUCATION:

- * PhD in Medical Physics, August 1984
University of Wisconsin-Madison
Medical Physics Department
- * MS in Nuclear Engineering, May 1983
University of Wisconsin-Madison
Nuclear Engineering Department
- * MS in Medical Physics, May 1982
University of Wisconsin-Madison
Medical Physics Department
- * Advanced Medical Physics Program, November 1978-June 1979
The University of Texas at Houston
MD Anderson Hospital and Tumor Institute, completed
courses in:
External Beam, Interstitial and Intracavitary Techniques,
Principles, and Manual and Computer Methods of Calculation,
on High-Energy Electrons, X-ray and Neutron Dosimetry.
- * Advanced Physics Program, first semester 1975
University of Sao Paulo, Physics Institute, Brazil
Energy and Environment, Techniques in Nuclear Physics
- * Advanced Physics Program, second semester 1975
State University of Campinas, Physics Institute, Brazil
Nuclear Physics IV, Radiochemistry

- BS in Physics, december 1974
University of São Paulo, Physics Institute, Brazil

EXPERIENCE

- October/85 to present
Research Associate, Human Oncology Department, University of Wisconsin
Clinical Work:
Routine calibration of Clinac 4s, Linac 15 and Cobalt 60.
Quality assurance of Clinacs, Cobalt 60 unit, simulators and CT scanner.
Clinical Research Projects:
Use of CT scanner (Philips) for treatment Planning purposes on ADCL Therapian System.
Implementation of the Electron Monte Carlo Algorithm in the Therapian System.
Research Projects:
Experimental Derivation of Beta for High Energy Photons.
Determination of 3D dose distribution by 1280 imaging using Fricke dosimeter.
Theoretical calculations of β for high energy photons by analytical and Monte Carlo (GEANT Code) methods.
- September/84 to September/85
Research Associate, Instituto de Radioproteção e Dosimetria, Rio de Janeiro, Brazil
Projects in radiation dosimetry involving water calorimeters, measurement of x-ray spectra, construction of ion chambers
- February/80 to August/84
Research Assistant at the Medical Physics Department, University of Wisconsin, Madison, Wisconsin
Projects in hyperthermia, clinical electron beam modified by magnetic fields, photon beams electron contamination, electron beam arc therapy
- July/77 to September/79
Head of the Dosimetry Section of Centro de Oncologia, Campinas, Campinas, Brazil

- * May/78 to September/79
Teacher of the course of Physics at the Faculdade de Ciências Médicas of Pontifícia Universidade Católica de Campinas, Campinas, Brazil
- * December/76 to June/77
Fellow in Medical Physics, MD Anderson Hospital and Tumor Institute, Houston, TX
- * January/75 to November/76
Physicist at the Clínica de Radioterapia Geral e Supervoltagem S/C, Hospital Sirio-Libanes, São Paulo, Brazil
- * January/76 to October/76
Health physicist of Secretaria do Estado de Saúde, São Paulo, Brazil
- * September/72 to December/74
Dosimetrist at the Clínica de Radioterapia Geral e Supervoltagem S/C, Hospital Sirio-Libanes, São Paulo, Brazil

HONORS *

- * March 1984, Knopp Travel Award to present a paper at the Radiation Research Society Annual Meeting in Orlando, FL
- * Feb to Aug 1984, fellowship from Comissão Nacional de Energia Nuclear to complete the graduation work at the University of Wisconsin-Madison
- * Feb/80 to Jan/84, fellowship from Ministry of Education, Brazil to obtain a PhD degree in Medical Physics at UWMadison
- * 1979, Sakura Award for best article in the journal: Radiologia Brasileira.
- * Dec/76 to June/77, fellowship from AECL to study at MD Anderson Hospital and Tumor Institute, Houston, Texas

SOCIETIES

- * American Association of Physicists in Medicine
- * Health Physics Society

* Radiation Research Society

* Associação Brasileira de Físicos em Medicina, Brazil

TEACHING EXPERIENCE

* Faculdade de Ciências Médicas da UNICAMP

Fall 1978: Medical Physics

Spring 1979: Medical Physics

Fall 1979: Medical Physics

* Centro de Estudos e Pesquisas Oncológicas de Campinas

In charge of the Radiation Therapy Technologist Training Program, Spring 1978 and Spring 1979

In charge of the course: "Use of Ionization Chambers in Radiation Dosimetry", Jun/79 and Nov/78

In charge of the course: "Radiotherapy Physics", Feb/79

In charge of the course: "Treatment Planning in Radiotherapy", June/79

Teacher of the course: "Radiodiagnostic Physics", Nov/78

* Associação Brasileira de Físicos em Medicina

"Treatment Planning in Radiotherapy", October/78

"Radiation Dosimetry Protocol", September/85

INVITED TALKS

* Intracavitary Brachytherapy: Our Method
Centro de Oncologia Campinas, December 1973

* Radiotherapy Physics

Associação Brasileira de Físicos em Medicina Annual Meeting, July 1978

* Treatment Planning in Central Nervous System Tumors
Hospital AC Camargo, São Paulo, December/74

* Dosimetric Aspects of Intracavitary Brachytherapy
Hospital AC Camargo, São Paulo, November/71

* Absolute Measurement of Exposure

Instituto de Radioproteção e Dosimetria, São de Janeiro, April 1985.

- Theoretical Inconsistencies in Radiation Dosimetry.
IAEA Training course, Rio de Janeiro, October, November 1981.

SCIENTIFIC EXHIBITS

1. Faliwal BR, Thomassen BR, Sibata C, Greenberg J. Wiley AL: A collimation system for electron beam arc therapy. American Association of Physicists in Medicine, Boston, Massachusetts, August, 1981.
2. Faliwal BR, Wiley AL, Sibata C, Filamor GU: Deep Heating Characteristics of the Magnetron System. American Association of Physicists in Medicine, Boston, Massachusetts, Aug 28, 1981.
3. Faliwal BR, Sibata C: Dynamic Modification of Electron Beams. V Conference of the Association of Medical Physicists of India, Coimbatore, India, January 13-15, 1982.
4. Sibata CH, Faliwal BR, Attix FH: Absorbed Dose and Collision Kerma Relationship for High-Energy X-rays. Radiation Beams of Society, Orlando, Florida, March 1984.
5. Sibata CH, Cecatti ER, de Almeida CE: X-ray Spectra Intercomparison by Different Methods. Brazilian Association of Medical Physicists, Belo Horizonte, Brazil, September 1985.
6. Sibata CH, Araujo MM, Cecatti ER, de Almeida CE: Absorbed Corrections for High-Energy X-rays. Brazilian Association of Medical Physicists, Belo Horizonte, Brazil, September 1985.
7. Austerlitz C, Sibata CH, de Almeida CE: Graphite Transmission Chamber. Brazilian Association of Medical Physicists, Belo Horizonte, Brazil, September 1985.
8. Araujo MM, Cecatti ER, Malamut C, de Almeida CE, Sibata CH: Effective Point of Measurement for Ion Chambers in Electron Beams- A Model. Brazilian Association of Medical Physicists, Belo Horizonte, Brazil, September 1985.

ABSTRACTS AND PRESENTATIONS

1. Pereira AI, Sibata CH: Individual monitoring in the use of gold seed implants for breast cancer (in portuguese). Medical Physics Symposium, Brasilia, Brazil, July 1976.

2. Miyamoto N, Zanardo EL, Craveiro PM, Oliveira M, Sibata CH, Cecatti ER: Dose received by the public in the 70 and 80's years (in portuguese). Medical Physics Symposium, Brazil, Brazil, July 1978.
3. Cecatti ER, Sibata CH, de Almeida CE: Driftless Factors for Co-60 gamma-ray beams (in portuguese). SBPE Annual Meeting, Sao Paulo, July 1978.
4. Sibata CH, de Almeida CE: Comparisons of buildup curves from different linacs. Conference of the 10th Anniversary of ABFM, Sao Paulo, Brazil, September 1979.
5. Sibata CH, de Almeida CE: Clinical and Physical Parameters in the Electron Beam Dosimetry. Conference of the 10th Anniversary of ABFM, Sao Paulo, Brazil, September 1979.
6. Craveiro PM, Mendonca AD, Sibata CH, Pereira AJ: Radiograph with 4 and 8 MeV x-ray beams in the tumor localization (in portuguese). II Latin American Conference in Medical Physics, Belo Horizonte, Brazil, July 1975.
7. Craveiro PM, Pereira AJ, Niziane HA, Sibata CH, Mendonca AD: Partial irradiation of the cardiac area in ischemic patients (in portuguese). II Latin American Conference in Medical Physics, Belo Horizonte, Brazil, July 1975.
8. Pereira AJ, de Silva CBB, Craveiro PM, Sibata CH: Whole body irradiation dosimetry with 4 MeV electrons (in portuguese). I Latin American Conference in Medical Physics, Belo Horizonte, Brazil, July 1975.
9. Sibata CH, de Almeida CE: Dosimetric characteristics of the 4 MeV x-ray beam from the Sagittaire linac (in portuguese). II CRILA, Guarujá, Brazil, October 1978.
10. Cecatti ER, Sibata CH, de Almeida CE: Isodose curves for the Sagittaire electron beams (in portuguese). II CRILA, Guarujá, Brazil, October 1978.
11. Kawakami NS, Sibata CH, de Almeida CE: Isodose curves for tangential breast applicator (in portuguese). Guarujá, Brazil, October 1978.
12. Alexandre AC, Sibata CH, de Almeida CE: Verification of a Co-60 gamma-ray beam isodose curves (in portuguese). II CRILA, Guarujá, Brazil, October 1978.
13. Paliwal RB, Sibata CH, Turner PA, Wiley AJ: Patterns of Heating Produced with the Computer-Controlled-Closed-Looped RF Hyperthermia System. AAPM Annual Meeting, Albuquerque, New Mexico, July 1980.

14. Paliwal BR, Turner P, Gibbs F, Wiley AL, Fong C, Sibata CH, Filamor C: 13.5 MHz RF Magnetron Induced Heating Patterns in Phantom and in the Live and Terminated Pig, ABRN, American Cancer Society Meeting, Dallas, TX, October 1981.
15. Paliwal BR, Thomadsen BR, Sibata C, Greenberg AL, Wiley AL: A Collimation System for Electron Beam Arc Therapy, Med Phys, 8(4):500, July/August, 1981.
16. Paliwal BR, Wiley AL, Sibata C, Filamor C: Deep Heating Characteristics of the Magnetron System, Med Phys, 8(4):500, July/Aug 1981.
17. Thomadsen BR, Paliwal BR, Sibata C: A Tertiary Collimation System of Electron Arc Therapy, Electron Dosimetry and Arc Therapy Symposium, Madison, WI, September 1981.
18. Paliwal BR, Thomadsen BR, Sibata C, Greenberg AL, Wiley AL: A Collimation System for Electron Beam Arc Therapy, ABRN Annual Meeting, Boston, MA, August 1981.
19. Thomadsen BR, Paliwal BR, Laurson F, Sibata C, Seaborg M: The Use of Effective Angle in Electron Beam Arc Therapy Calculations, RSNA, Chicago, IL, Dec 1982.
20. Sibata CH, Paliwal BR, Attia FH: Dose and Form Relationship for High-Energy X-rays, AAPM Annual Meeting, New York, NY, July 1983.
21. Higgins FD, Sibata CH, Attia FH: Calculations and measurement techniques for estimation of skin doses from electrons in Co-60 gamma-ray beams, AAPM Annual Meeting, New Orleans, LA, 1982.

BOOKS AND MONOGRAPHS

1. Pereira AJ, Sibata CH, Rota HC: Atlas of Computed Isodose Curves for Megavoltage X-ray Beams (in portuguese), Supplement 1 of ABRN Bulletin, July 1978.
2. de Almeida CE, Sibata CH: Technical Profiles, Resonated and Radiation Therapy in Breast Cancer (in portuguese), Chapter 11 "Therapeutics in Mastology" edited by JA Pinheiro, Sao Paulo, 1984.

ARTICLES OR PROCEEDINGS PUBLISHED OR ACCEPTED IN REFERENCED JOURNALS

1. Cecatti ER, Sibata CH, de Almeida CE: Off-axis factor for a Co-60 gamma-ray beam (in portuguese). Radiol. Bras., XII, 101:105, 1978.
2. Alexandre AC, Sibata CH, de Almeida CE: Verification of isodose curves for the Eldorado 78 Co-60 gamma ray beams (in portuguese). Revista Brasileira de Cancerologia, 22(4):417, 1978.
3. Sibata CH, de Almeida CE: Comparison of Electron build-up curves from Different Linacs. Proc. Conference of the 10th ABFM Anniversary, 53a:544, 1979.
4. Cecatti ER, Sibata CH, de Almeida CE: Study of the physical parameters of the Sagittaire electron beams. Proc. Conference of the 10th ABFM Anniversary, 59a:520, 1979.
5. Sibata CH, de Almeida CE: Physical and dosimetric parameters of the 25 kV photon beam from the Sagittaire linac. Radiol. Bras., XIII, 43:52, 1980.
6. de Almeida CE, Sibata CH: New Concepts in Electron Beam Dosimetry. Proc. of the Conference of the 10th ABFM Anniversary, 401:425, 1979.
7. Alexandre AC, Cecatti ER, Sibata CH, de Almeida CE: Radiation dose in the 7 and 19 kV electron beams from a linac and the dose distribution for small and medium size fields. Radiol. Bras., XX, 110:115, 1982.
8. Kawahara NS, Sibata CH, de Almeida CE: Isodose Curves for a Tangential Breast Applicator. Rev. Interam. Radiol., 2(4):17, 1979.
9. Sibata CH, de Almeida CE: Build-up Curves of Scanned High-Energy Electron Beams from the Sagittaire Linac. Nukleonika, 35(4):378, 1980.
10. de Almeida CE, Sibata CH, Cecatti ER, Kawahara NS, Oliveira JG, Petropoulos IO: Quality control program for electron beam treatment planning calculation. Proc. World Congress on Med Phys and Biomed Engin. Hamburg, 1982.
11. Higgins FD, Sibata CH, Attix FH, Pollock BR: Calculational methods for estimating skin dose from electrons and x or gamma-ray beams. Med Phys., 10(5), 822, 1983.

12. Thomadsen BR, Paliwal BR, Sibata CH: A Tertiary Collimation System of Electron Beam Arc Therapy. Proc. of the Electron Dosimetry and Arc Therapy Symposium, Madison, 1982.
13. Higgins PD, Sibata CH, Paliwal BR: Determination of Contamination-free Buildup for Electron Beams. Rad. Eff., 133, 1982.
14. Sibata CH: Theoretical inconsistencies in High Energy Electron Dosimetry. Proc. IAEA Interregional Training Course on Dosimetry, 1985.
15. Paliwal BR, Thomadsen, Sibata CH: Physics Considerations in Electron Beam Arc Therapy. Proc. 9th Varian Clinical Users Meeting, 1982.
16. Sibata CH, Paliwal BR, Attix FH: Experimental Determination of Betas for High-Energy Photons. submitted to Rad. Phys.
17. Aosterlitz C, Sibata CH, de Almeida CE: A Graphical Transmission Chamber. submitted to Nucl. Inst. Meth.