

CURRICULUM VITAE

Name: Dr. Kavuma Awusi **Date of Birth:** 16th March 1971 **Nationality:** Ugandan
Profession: Radiotherapy Medical Physicist **Position:** Senior Medical physicist
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Academics and clinical / professional training courses

Course name / subject	Provider	Degree / Certificate	Duration	Dates
PhD (Medical Physics)	Glasgow University - Scotland	Degree	3.5 years	Nov 2007 – May 2011
MSc (Medical Physics)	Orange Free State University – South Africa	Degree	2 years	Jan 1999-July 2000
MSc (Physics)	Makerere University – Kampala Uganda	Degree	2 years	1994 - 1997
BSc (Physics and Mathematics)	Makerere University – Kampala Uganda	Degree	3 Years	Sep1989-June 1989
Scottish Radiotherapy Physics workshop	Radiotherapy Dept Dundee	Certificate	1 day	12/06/2010
Advances and challenges in radiation protection of patients	Versailles - France	Certificate	3 days	2-4 Dec 2009
Scottish Radiotherapy Physics workshop	Radiotherapy Dept Glasgow	Certificate	1 day	13/06/2009
Scottish Radiotherapy Physics workshop	Radiotherapy Dept Edinburgh	Certificate	1 day	12/04/2008
Workshop on radiological equipment used radiotherapy treatment planning	Cairo - Egypt	Certificate	1 week	10-14 Dec 2006
Training workshop on auditing of radiotherapy units & practices	Johannesburg Hospital Radiotherapy Dept South Africa	Certificate	1 week	25-29 Sept 2006
Training workshop on In vivo dosimetry in radiotherapy	Algiers Hospital Radiotherapy Dept Algiers - Algeria	Certificate	1 week	20-21 May 2005
Training workshop on In vivo dosimetry in radiotherapy	Algiers Hospital Radiotherapy Dept Algiers - Algeria	Certificate	1 week	20-21 May 2005
Training workshop on codes of practice in radiotherapy dosimetry	Johannesburg Hospital Radiotherapy Dept South Africa	Certificate	1 week	20-24 Sept 2004
Training workshop on AIDS related cancers	Mulago hospital, Radiotherapy Dept	Certificate	1 week	6-10 Sept 2004
Acceptance testing and commissioning of radiotherapy equipment	Tripoli Hospital, Radiotherapy Department Tripoli -Libya	Certificate	1 week	12-16 Oct 2003
Radiotherapy simulator QA course	Nucletron – Kampala Uganda	Certificate	1 week	17-24 Sept 2001
Treatment planning and dosimetry in Radiotherapy	Service de Radiotherapie Instuut Sala Azaiz, Tunis - Tunisia	Certificate	2 weeks	2/06/1997 – 13/06/1997
On the job training in clinical medical physics	Merle west cancer centre – Oregon USA	Certificate	3 months	Nov1994-Feb 1995
Radiation protection course	Argonne National Lab Chicago - USA	Certificate	2 months	Sep 1994-Nov1994

Employment and Working History:

1994- 1999 – Joined Radiotherapy Dept as medical physics trainee

1999- 2000 – Msc Medical physics at Orange Free State University, South Africa

2001 – 2007 – Radiotherapy Dept Mulago Hospital

Nov 2007 – May 2011 – PhD at Glasgow University / Beatson cancer center, Scotland

Summary of medical physics experience (1994-2007) at Mulago Radiotherapy**Department**

- I participated in the installation, acceptance testing and commissioning of Teletherapy units (GWGP80 Cobalt-60), the Cs-137 Intracavitary unit (Cervifix), the treatment planning system (Theraplan plus) and simulator (Simulix).
- Perform periodical (daily, monthly, annual) quality assurance checks of machines, facilities and systems (Cobalt-60, Cs-137, simulator and planning system), for the treatment of patients with radiotherapy.
- QA done on external beam source units, divided into three categories:
- Liaison with doctors and therapy radiographers to perform radiotherapy treatment planning, preparation, and delivery.
- Treatment time and dose calculation using Theraplan plus TPS.
- Machine (Cobalt-60, Cs-137 and simulator) operation and patient treatment delivery
- Performing radiation monitoring / surveys in the working area.
- Providing patient information and support on treatment and radiation
- X-ray film processing, acquisition of chest, abdominal and other site X-rays for simulation and treatment planning purposes
- Ensuring that radiological equipment is functioning and well maintained.
- Teaching basic medical / radiation physics and radiation safety to different students e.g. M.Med students, MBChB, radiographers, nurses, etc.
- Ensuring radiation safety / radiation monitoring of all medical workers, patients and the general public by performing radiation monitoring / surveys in the working area.
- Assessment of radiation doses to staff with liaison with the national radiation protection authority.
- Involved in specification of new equipment, purchase, acceptance testing, commissioning, maintenance and quality control of the equipment.

- Advise radiographers, radiation oncologists, and others in the use of new equipment and or methods and to draft / provide physical – technical guidelines.
- Participated in the day-to-day clinical issues and clinical research.
- Providing patient information and support on treatment and radiation
- Designing and testing of physical / technical aids or methods for both the treatment of patients (e.g lead-shields cutting, Vac-Bags, Head & Neck braces) and physical measurements
- Participate in planning / budgeting and preparation of reports for the department.
- Asses performance of junior staff, and identifying their training needs and make appropriate recommendations to higher managerial levels.
- In-depth statistical analysis knowledge including clinical (qualitative) and physical (quantitative) data
- Obtaining information from Patient Medical Records and charts
- Preparation of periodical department equipment wish-list (e.g In vivo dosimetry system, personnel dosimeter, area survey meters, electrometers, etc) for budgetary purposes giving their technical description and possible suppliers
- Attend management meetings and any other administrative duties assigned by my seniors.

Summary of medical physics training / experience at the Beatson oncology centre (2007 – 2011)

The Beatson West of Scotland Cancer Centre has state of the art radiotherapy equipment and services, with eleven linear accelerators and a full range of supporting facilities, including IMRT, RapidArc, IGRT, Stereotaxy, CT and MRI, Simulators, PET/CT, HDR and prostate seed brachytherapy services. My research work at the Beatson focused on calibration of electronic portal imaging devices (EPID) for transit in vivo dosimetry.

- Operation in various modes of the Varian high and low energy accelerators
- Quality assurance of linear accelerators (daily, monthly, quarterly)
 - Daily preparation (start-up) of accelerator for clinical usage
 - Collimator, gantry, couch vertical, floor rotations calibration checks
 - Light field centre cross rotation, optical distance indicator, laser alignment, Field size and light projection coincidence checks

- Multi leaf collimator QA tests
- EPID / PV / OBI quality assurance tests
- Basic QA methodology for dosimetry of treatment machines
 - Dosimetry equipment operation (electrometers, ionisation chambers, MapCheck, LinaCheck, diodes, TLD, etc)
 - Linac photon output determination (definitive output measurements)
 - Dosimetry system linearity check measurements
 - Calibration of radiation detectors (Dosimeter / electrometer cross calibration) for radiation measurement
 - Beam flatness and symmetry / symmetry versus gantry angle check
 - Photons beam quality index determination
 - Electrons standard and relative out puts measurements
 - Electrons half-value depth measurements
 - Dose verification (patient specific pre-treatment QA) of IMRT and RapidArc plans using MapCheck devices, phantoms and film dosimetry
- Radiotherapy treatment planning using Eclipse treatment planning system for different types of cancer patients
- Daily preparation of CT simulators
- X-ray film processing and dose analysis
- Computing methods for quality assurance (QA) purposes
- Image processing and data extraction from raw data (EPID and Eclipse TPS) files, for an in-depth mathematical modelling, quantitative and statistical analysis using MATLAB v2008b (The Math works, Inc.)

E: Publications:

- 1) **Awusi Kavuma**, Martin Glegg, Mohamed Metwaly, Garry Currie and Alex Elliott (2011) Calculation of exit dose for conformal and dynamically wedged fields, based on water equivalent path length measured with an amorphous silicon electronic portal imaging device (In press – J. Appl. Clin. Med. Phys).
- 2) **Awusi Kavuma**, Martin Glegg, Mohamed Metwaly, Garry Currie and Alex Elliott (2010) A novel method for patient exit and entrance dose prediction based on water equivalent path length measured with an amorphous silicon electronic portal imaging device *Phys. Med. Biol.* **55** 435–452

- 3) **Awusi Kavuma**, Martin Glegg, Garry Currie and Alex Elliott (2008) Assessment of dosimetrical performance in 11 Varian a-Si500 electronic portal imaging devices *Phys. Med. Biol.* **53** pg 6893–6909
- 4) Gakwaya A, Kigula-Mugambe J, **Kavuma Awusi**, Luwaga A, Fualal J, Jombwe J and Kanyike D (2008) Cancer of the breast: 5-year survival in a tertiary hospital in Uganda; *British Journal of Cancer* **99** 63-67
- 5) Kigula-Mugambe J, **Kavuma Awusi** Cancer of the cervix: A comparison of outcomes in patients with known HIV serostatus treated with radiotherapy, *East African Medical Journal* Vol 83 No.8 August 2006.
- 6) Kigula-Mugambe J, **Kavuma Awusi** Epidemic and endemic Kaposi's sarcoma: A comparison of outcomes and survival after radiotherapy, *Radiotherapy & Oncology Journal* Volume 76, Issue 1, Pages 59-62 July 2005
- 7) Kigula-Mugambe J, **Kavuma Awusi** Handbook on Radiotherapy for Cancer patients – A guide to self help during cancer treatment, Axis Printers Kampala – Uganda.

F: External Lecturing and Examining:

Part time lecturer at the Islamic University in Uganda, from 1998 teaching radiation physics. I had breaks between 1999 – 2000 when I was away in South Africa for M.Med.Sc course and between 2007 – 2011 when I was in UK for PhD medical physics course.

G: Conference Papers:

- 1)) Awusi Kavuma, Martin Glegg, Mohamed Metwaly, Garry Currie and Alex Elliott (Dec 2- 4, 2009) Patient exit and entrance dose prediction based on water equivalent path length measured with an amorphous silicon electronic portal imaging device. *International conference on modern radiotherapy: Advances and challenges in radiation protection of patients. Versailles - France* Awusi Kavuma,
- 2 Martin Glegg and Mohamed Metwaly (12 June 2008) Development of an algorithm to predict entrance and exit dose to a phantom from EPID. *Scottish Radiotherapy physics workshop Glasgow*
- 3) Kavuma.A. Radiation monitoring with emphasis to personnel, Kampala. A Paper presented at The International Conference organized by the Uganda Society for the advancement of Radiology and imaging, Kampala Oct 1996.

4) Kavuma,A; Willmse, C. Using Monte Carlo techniques to evaluate the dose distribution from a radiotherapy treatment planning system, Durban, South Africa. A Paper presented at the 40th International Congress of the South African Association of Physicist in Medicine and Biology, May 2000.

5) Kavuma,A; Willmse, C. Monte Carlo simulation of the GWGP-80 cobalt-60 unit, Bloefontain, South Africa. A Paper presented at the 41st International Congress of the South African Association of Physicist in Medicine and Biology, July 2001.

H: Awards

Certificate of merit awarded by the executive director and management of Mulago hospital for excellent and exemplary performance during the year 2005 in the Radiotherapy department.

I: Membership of Professional Organizations:

- Member of UK Health profession Council (Clinical Scientist) Reg No: CS17729
- Member of the American Association of Medical Physicists - Partners in Physics (PIP No: 28566)
- Member of the Uganda Society for the advancement of Radiology and imaging
- Member on the radiation safety committee of Mulago hospital
- Associate member of the South African Association of Physicist in Medicine and Biology (2000 – 2004)

J: Future Interests: More involvement in clinical medical physics and research in radiotherapy field. My main research areas of interest are radiotherapy dosimetry and planning

K: Declaration:

I declare that the information stated above is true to the best of my knowledge.

Signed: Kavuma Awusi

Date: 25th May 2011