

## **1. Fundamentals of oncology and radiotherapy**

### **Recommended literature:**

- Ruddon RW, Cancer Biology, Oxford University Press, 2007
- Introduction to the Cellular and Molecular Biology of Cancer, Eds. Margaret Knowles and Peter Selby, Oxford University Press, 2005.
- Raymond E Lenhard Jr, Robert T Osteen, Ted Gansler Eds. Clinical Oncology, American Cancer Society.

## **2. Overview of radiation physics**

### **Recommended literature:**

- A. Froma, M. Mast, J. Welleweerd (redactie). Techniek in de Radiotherapie. Elsevier, 2007.
- J. Scheurleer, G. de Vries, J. Welleweerd (redactie). Fysica voor beeldvorming en radiotherapie, Reed Business, 2006.
- Graham DT, Cloke P. Principles of Radiological Physics. 4th Ed. Churchill Livingstone 2003
- Podgorsak EB. Radiation Physics for Medical Physicists. Biol Med Phys, Biomedical Engineering. Springer 2005.
- P. Mayles et al (Eds). Handbook of Radiotherapy Physics. Theory and Practice. Taylor and Francis Groups. 2007.
- J.R. Williams, D.I. Thwaites (Eds). Radiotherapy physics in practice, Oxford University Press, Oxford, second edition 2000.
- F.M. Khan, J.P. Gibbons. The physics of radiation therapy. Lippincott Williams & Wilkins. Fifth edition 2014.

## **3. External beam radiotherapy**

### **Mandatory literature:**

- NCS Report 8. Kwaliteitscontrole van Medische Lineaire Versnellers -Methoden voor kwaliteitscontrole, wenselijke toleranties en frequenties, NCS, december 1995. or
- NCS Report 9. Quality control of medical linear accelerators. Current practice and minimum requirements, NCS, August 1996.
- Monitor unit calculations for high energy photon beams. ESTRO Physics booklet 3, ESTRO, 1998.
- NCS Report 12. Head and phantom scatter corrections. NCS, 1998.
- NCS Report 11. Quality control (QC) of simulators and CT scanner and some basic QC methods for treatment planning systems, current practice and minimum requirements. NCS, September 1997.
- ICRU Report 50. Prescribing, recording and reporting photon beam therapy. International Commission on Radiation Units and Measurements, Bethesda, 1993.
- ICRU Report 62. Prescribing, recording and reporting photon beam therapy. (supplement to ICRU 50), 1999.
- ICRU Report 83. Prescribing, Recording, and Reporting Intensity-Modulated Photon-Beam Therapy (IMRT), 2010.
- ICRU Report 91 - Prescribing, Recording, and Reporting of Stereotactic Treatments with Small Photon Beams, 2017.
- Ezzell G et al. Guidance document on delivery, treatment planning, and clinical implementation of IMRT: report of the IMRT subcommittee of the AAPM radiation committee. Med Phys 2003; 30: 2089-2115.
- Quality assurance of 3-D treatment planning systems for external photon and electron beams; Practical guidelines for acceptance testing, commissioning and periodic quality control of radiation therapy treatment planning systems. NCS Report 15, 2006.

### **Recommended literature:**

- ESTRO booklet & AAPM Report series & ICRU report series.

- Geometrical Uncertainties in Radiotherapy. British Institute of Radiology, 2003
- E. G. A. Aird and J. Conway. CT simulation for radiotherapy treatment planning, British Journal of Radiology, 75, 2002, 937-949.
- Magnetic Resonance Imaging in Radiation Oncology, Seminars in Radiation Oncology, Vol 24 (3), July 2014
- Mutic S et al. Quality assurance for computed-tomography simulators and the computed-tomography-simulation process: report of the AAPM Radiation Therapy Committee Task Group No. 66, Med Phys 2003; 2762-2792.
- Korreman S. et al. The European Society of Therapeutic Radiology and Oncology-European Institute of Radiotherapy (ESTRO-EIR) report on 3D CT-based in-room image guidance systems: a practical and technical review and guide. Radiother Oncol. 2010; 94(2):129-44.
- GS Mageras et al. Deep inspiration breath hold and respiratory gating strategies for reducing organ motion in radiation treatment. Semin Radiat Oncol. 2004;14(1):65-75.
- A. Martin et al. Stereotactic body radiotherapy: a review. Clin Oncol (R Coll Radiol). 2010;22(3):157-72.
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- Dutch mouldroom technologists (NMT) website at <http://www.mouldned.nl>
- D.L.G. Hill, Medical image registration, Phys. Med. Biol. 46 (2001) R1-R45
- M.L. Kessler and M. Robinson. Image Registration and Data Fusion for Radiotherapy Treatment Planning. Springer Berlin Heidelberg. 2006.
- Kahn FM. Treatment planning in radiation oncology. Lippincott Williams & Wilkins 2007.
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- Hogstrom KR. Treatment planning in electron beam therapy. In: Frontiers of radiation therapy and oncology. 25.
- T. Bortfeld, Optimized planning using physical objectives and constraints, Sem. Radiat. Oncol. 9 (1999) 20-34.
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- Absorbed Dose Determination in External Beam Radiotherapy, An International Code of Practice for Dosimetry Based on Standards of Absorbed Dose to Water. TRS-398, IAEA, Vienna, 2000.
- Report of the AAPM Task Group No. 105: Issues associated with clinical implementation of Monte Carlo-based photon and electron external beam treatment planning. Med. Phys. Volume 34, Issue 12, pp. 4818-4853 (December 2007).
- T. Knoös et al. Comparison of dose calculation algorithms for treatment planning in external photon beam therapy for clinical situations. Phys. Med. Biol. 2006: 51: 5785.
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- Kenneth R Hogstrom en Peter R Almond. Review of electron beam therapy physics. Phys. Med. Biol. 2006; 51: R455–R489.
- F. Verhaegen, Monte Carlo modelling of external radiotherapy photon beams, Phys. Med. Biol. 48 (2003) R107-R164.
- C.W. Hurkmans, P. Remeijer, J.V. Lebesque, B.J. Mijnheer. Set-up verification using portal imaging; review of current clinical practice, Radiotherapy and Oncology 58 (2001), 105-120.

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- M. van Herk, Errors and margins in radiotherapy, *Sem. Radiat. Oncol.* 14 (2004) 52-64.
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- Keall PJ, Mageras GS, Balter JM et al. The management of respiratory motion in radiation Oncology. Report of AAPM Task Group 76. *Med Phys* 2006; 33:3874-3900.
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- A. Mans et al. 3D Dosimetric verification of volumetric-modulated arc therapy by portal dosimetry. *Radiother Oncol.* 2010 Feb;94(2):181-7.
- M. Wendling et al. A simple backprojection algorithm for 3D in vivo EPID dosimetry of IMRT treatments. *Med Phys.* 2009 Jul;36(7):3310-21.

#### 4. **Brachytherapy**

##### **Mandatory literature:**

- ICRU Report 38. Dose and volume specification for reporting intracavitary therapy in gynaecology, ICRU, Bethesda, 1985.
- ICRU Report 58. Dose and volume specification for reporting interstitial therapy, ICRU, Bethesda, 1997.
- NCS rapport 13. Quality Control in Brachytherapy, Current practice and minimum requirements, NCS, November 2000.
- Quality control of sealed beta sources in brachytherapy Recommendations on detectors, measurement procedures and quality control of beta sources. NCS Report 14, 2005, <http://www.stralingsdosimetrie.nl/ncsreport.php>.

##### **Recommended literature:**

- ESTRO Booklet series & ICRU Report series & AAPM report series.
- *The Physics of Modern Brachytherapy for Oncology. Series in medical physics and biomedical engineering.* Baltas D, Sakelliou L, Zamboglou N. CRC Press. ISBN: 0750307080, 9780750307086. 2007.
- *The GEC ESTRO Handbook of Brachytherapy.* Gerbaulet A, Pötter R, Mazon JJ, Meertens H and Van Limbergen E, Editors. Ash D, Briot E, Haie-Meder C, Lartigau E, Scalliet P, Venselaar J and Wambersie A. ISBN 90-804532-6. 2002
- IAEA. International Atomic Energy Agency. "Calibration of photon and beta ray sources used in brachytherapy". Guidelines on standardized procedures at SSDs and Hospitals. IAEA-TECDOC-1274. March, 2002.
- Haie-Meder C, Pötter R, Van Limbergen E, et al. Recommendations from Gynaecological (GYN) GEC ESTRO Working Group (I): concepts and terms in 3D image-based 3D treatment planning in cervix cancer brachytherapy with emphasis on MRI assessment of GTV and CTV. *Radiother Oncol* 2005; 74:235-45.
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- Mazon JJ, Ardiet JM, Haie-Méder C. GEC-ESTRO recommendations for brachytherapy for head and neck squamous cell carcinomas. *Radiother Oncol* 2009; 91: 150–156.
- Pötter R. Image-guided brachytherapy sets benchmarks in advanced radiotherapy. Editorial. *Radiother Oncol* 2009; 91:141–146.

## **5. Dosimetry**

### **Mandatory literature:**

- NCS Report No. 7. Recommendations for the calibration of Iridium-192 high-dose-rate sources. NCS, 1994.
- NCS Report No. 10. Dosimetry of low and medium energy X-rays. NCS, 1997. Code of Practice for the Absorbed Dose Determination in High Energy Photon and Electron Beams.
- NCS Report 18. Code of Practice for the Absorbed Dose Determination in High Energy Photon and Electron Beams, 2008.
- NCS Report 22. Code of Practice for the Quality Assurance and Control for Intensity Modulated Radiotherapy, 2013.
- NCS Report 23. Audit of High-Energy Photon Beams in Belgian and Dutch Radiotherapy Departments, NCS, December 2013.
- NCS Report 24. Code of Practice for the Quality Assurance and Control for Volumetric Modulated Arc Therapy, February 2015.

### **Recommended literature:**

- Absorbed Dose Determination in External Beam Radiotherapy, TRS-398, IAEA 2000.
- Calibration of Reference Dosimeters for External Beam Radiotherapy, TRS-469, IAEA 2009.
- Attix FH. Introduction to Radiological Physics and radiation Dosimetry, Ed. Wiley-VCH Verlag GmbH & Co. 2004.
- Knoll GF. Radiation detection and measurement. Third edition. Ed. Wiley. 2000.
- ICRU Report 34 and 35.
- IPEM Report No 94. Commissioning and quality assurance of linear accelerators, IPEM, York, 2006.
- ESTRO booklet no. 5. Practical guidelines for the implementation of In Vivo Dosimetry with diodes in External Radiotherapy with photon beams (Entrance Dose). Huyskens DP et al. 2001.
- M.Essers, B.J. Mijnheer. In vivo dosimetry during external photon beam radiotherapy. *Int. J. Radiat. Oncol. Biol. Phys*, 43:245-259, 1999.

## **6. Particle therapy**

### **Recommended literature:**

- Kraft G. Tumor therapy with charged particles, *Progr Part Nucl Phys* 2000; 45:473-544.
- Krämer M et al. Treatment planning for heavy-ion radiotherapy: physical beam model and dose optimization, *Phys Med Biol* 2000; 45:3299–3317.
- Jäkel O et al. Treatment planning for heavy-ion radiotherapy: clinical implementation and application, *Phys Med Biol* 2001; 46:1101–1116.
- A.R. Smith, *Vision20/20: Proton therapy*, *Med. Phys.* 36 (2009) 556-568.
- H. Paganetti, *Proton therapy physics*, Series in Medical Physics and Biomedical Engineering.

## **8. Radiobiology and Radiobiological modelling**

### **Mandatory literature:**

- M. Joiner & A van der Kogel. *Basic Clinical Radiobiology*. 4th edition, Hodder Arnold, 2009.

**Recommended literature:**

- Dale R and Jones B (eds.), Radiobiological Modelling in Radiation Oncology, The British Institute of Radiology, 2007.
- Alberts B, Bray D, Hopkin K, Johnson A, Lewis J, Raff M, Roberts K, Walter P. Essential cell biology, Garland, 2009.
- Hall E, Giaccia AJ, Radiobiology for the radiologist, Lippincott, Wilkins & Williams, 2006.
- Introduction to the Cellular and Molecular Biology of Cancer, Eds. Margaret Knowles and Peter Selby, Oxford University Press, 2005.
- Hanahan D and Weinberg RA. The Hallmarks of Cancer. Cell 2000; 100: 57–70.
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- Y. Liao et al. Hypofractionation: what does it mean for prostate cancer treatment? Int J Radiat Oncol Biol Phys. 2010 Jan 1;76(1):260-8.
- J. Bourhis et al. Hyperfractionated or accelerated radiotherapy in head and neck cancer: a meta-analysis. Lancet. 2006 Sep 2;368(9538):843-54.

**9. Miscellaneous****Mandatory literature:**

- KWF-2011 rapport: Kanker in Nederland tot 2020: trends en prognoses, KWF Kankerbestrijding, sept 2011.