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BOOK REVIEW

Fundamentals of Radiation Oncology: Physical, Biological, and Clinical Aspects, edited by Dr. Hasan Murshed and authored by 61 contributors, 541 pp., 2024, Academic Press - an imprint of Elsevier, ISBN 978-0-443-22208-5, $105.00 (paperback), Cambridge, Massachusetts, USA.

Physical, Biological, and Clinical Aspects (2024) edited by Dr. Hasan Murshed (Medical Director of Hope Regional Cancer Center in Panama City, Florida) and authored by 61 contributors covers radiation biology, physics, and clinical radiation oncology, the three topics of four exams for American Board of Radiology (ABR) initial board certification in radiation oncology, in 541 numbered pages that includes a list of abbreviations and a subject index. Part I (Chapters 1–4) is about the basic science of radiation oncology, largely radiobiology. Part II (Chapters 5–14) is about techniques and modalities of radiation oncology, largely medical physics. Parts III (Chapters 15–26) and IV (Chapters 27–28) are about clinical radiation oncology. Part III is broken down by disease site and material for each disease site is organized with a consistent structure. Part IV is about palliative care (Chapter 27) and largely radiation toxicity management (Chapter 28).

Chapter 1 provides an overview of radiation physics, dosimetry, and treatment planning. Topics include electromagnetic radiation and interaction properties (e.g., wavelength, frequency and photon interactions), the physics of dosimetry (e.g., inverse square law, backscatter and percent depth dose), linac calibration (e.g., monitor unit formulas), electron beam dosimetry (e.g., practical range), radiation treatment planning (e.g., gross, clinical, internal, and planning target volumes GTV, CTV, ITV, and PTV respectively, organ at risk or OAR volume, planning OAR volume, isodose distribution, and dose-volume histogram or DVH), external beam radiotherapy (RT – e.g., 3-dimensional conformal radiotherapy or 3DCRT, intensity modulated radiotherapy or IMRT, volumetric modulated arc therapy or VMAT, and image-guided radiotherapy or IGRT), brachytherapy (e.g., interstitial and intracavitary), and other modalities (e.g., stereotactic radiosurgery – SRS, stereotactic body radiotherapy – SBRT, particle radiotherapy, and unsealed radionuclides). Illustrations such as of photon interactions (e.g., photoelectric absorption, Compton scattering, and pair production) and of linear accelerator components aide in understanding. Treatments goals such as having "> =95% of the PTV within 100% of the prescribed isodose line while maintaining all the critical structural constraints set forth by the physician" are mentioned. Radiation oncology resident physician readers who have yet to take the ABR radiation oncology medical physics board exam may find it helpful to consult another resource, e.g., a medical physics textbook (McDermott and Orton 2010; Ford 2025; Gibbons 2020), to understand certain terms (e.g., 'positron').

Chapter 2 is about radiation protection and safety, including radiation quantities (e.g., radiation exposure), radiation protection factors (e.g., time of radiation exposure, distance from the radiation source, and shielding), and occupational and general public dose limits recommended by the National Council on Radiation Protection and Measurements (NCRP) – The Table 2.3 NRCP 150 mSv/year annual dose equivalent limit to the lens of the eye differs from the corresponding Table 16.5 limit of 50 mSv/year given in Hall et al.'s *Radiobiology for the Radiologist* 8th edition (Hall and Giaccia 2019), which may be related to differences in dates of recommendations. The chapter also covers the as low as reasonably achievable (ALARA) principle and non-stochastic and stochastic effects, and treatment room design, signage, labeling, and personnel requirements. Radiation Oncology resident physician readers who have yet to take the ABR radiation oncology medical physics board exam may find it helpful to consult another resource, e.g., a medical physics textbook (McDermott and Orton 2010), to understand certain terms (e.g., 'wipe test').

Chapter 3 is about radiation biology, including direct and indirect action, linear energy transfer, relative biological effectiveness, radiation effects on chromosomes, mechanisms of repair of radiation-induced deoxyribonucleic acid or DNA damage, cell survival curves and the linear-quadratic (L-Q) model, the four R's of Radiobiology, altered fractionation, biologically effective or equivalent dose, sublethal and potentially lethal damage, oxygen enhancement ratio, radiosensitizers and radioprotectors, molecular biology techniques, cell cycle kinetic parameters, functional subunits, early and late reacting tissues, whole-body irradiation-induced acute syndromes (i.e., prodromal, hematopoietic, gastrointestinal, cerebrovascular), deterministic and stochastic radiation effects, effects of radiation on the embryo and fetus, and sources of radiation exposure. Important values for the ABR radiation biology board exam such as 0.15 Gy to the testes for temporary sterility are included. From another resource (e.g., a radiobiology textbook), readers could know to exponentiate the "2" in "D2" in the surviving fraction formula for the L-Q model (Hall and Giaccia 2019; Chang et al. 2021) and know that "TD5/5" is the tolerance dose for 5% complication rate within 5 years (Hall and Giaccia 2019). The diffusion distance for oxygen is given as ~70um from blood vessels. It is not mentioned that the diffusion distance for oxygen varies from ~150 um from the arterial end of a capillary to a smaller distance from the venous end.

Chapter 4 is about Molecular Cancer Biology, including cell cycle phases and restriction points, tumor suppressor genes, proto-oncogenes and oncogenes, intrinsic and extrinsic apoptotic pathways, chemotherapies, and targeted therapies.

Chapter 5 is about Brachytherapy, including interstitial and intracavitary, radioactive sources, source strength

specifications, Task Group Number 43 (TG-43) dosimetry system, brachytherapy dose rate, the high dose rate remote afterloader, a computerized treatment planning process (e.g., importance of magnetic resonance imaging or MRI to identify target volumes), and clinical indications of brachytherapy. On page 78, point A is described and later labeled on an image in Figure 22.6, and "RLT images" are referred to without definition.

Chapter 6 is about IMRT (including VMAT) and IGRT. IMRT is described as using inverse planning in which a dose prescription and normal tissue constraints are given and software then calculates beam intensities and multileaf collimator sequences to achieve a desirable dose distribution. VMAT is described as IMRT while the gantry is rotating around the patient. IGRT is described as using imaging before and during radiotherapy to guide delivery of dose. The application of IMRT to brain, head and neck, breast, lung, and prostate cancers is discussed.

Chapter 7 is about stereotactic radiotherapy (RT), which is described as a radiotherapy technique that precisely delivers high-dose radiation in 1–5 fractions to at least one small target, for intracranial lesions. SRS is described as using "a single fraction of high-dose radiation to treat tumors." This SRS definition is not universally adhered to and other texts (e.g., the 8th edition of *Perez, Brady, Halperin, and Wazer's Principles and Practice of Radiation Oncology*) allow for "multifraction SRS" so long as stereotactic localization and targeting techniques are used (Halperin et al. 2025). In *Gunderson & Tepper's Clinical Radiation Oncology*, SRS is defined as "a distinct discipline that uses externally generated ionizing radiation in certain cases to inactivate or eradicate a defined target or targets in the head or spine without the need to make an incision" (Tepper et al. 2021). McDermott and Orton's *The Physics & Technology of Radiation Therapy* 2nd edition acknowledges that the definition of "SRS" "varies depending on the reference consulted" and "SRS" can refer to "any type of single- (or small number) fraction treatment in which the targeting is highly accurate" (McDermott and Orton 2010). In my clinical experience, "SRS" is typically used to describe stereotactic RT for an intracranial target while "SBRT" is typically used to describe stereotactic RT for an extracranial target.

Chapter 8 is about SBRT for lung cancer, including dose constraints for various dose and fractionation regimens in 1 to 5 fractions. The choice of regimen depends on tumor location and nearby critical structures with greater fractionation favored the closer the tumor is to the proximal bronchial tree. Peripheral, central, and ultracentral tumors are progressively closer to the tree. The term "peripheral" lung tumor is omitted from the "SBRT for Central & Ultracentral Lesions" section on page 106. Figure 8.2 provides a helpful diagram illustrating 2 centimeters within the proximal bronchial tree that is used to define a "central" tumor. Open questions are discussed, such as factors influencing the choice of surgery versus SBRT for a patient and how systemic therapy should be sequenced with SBRT.

Chapter 9 is about proton RT, which can sometimes be leveraged to deliver higher dose to the tumor and lower dose to surrounding normal tissues, clinical situations that may particularly benefit from protons (e.g., ocular, spinal, base of skull, liver, and pediatric tumors, and re-irradiation), and the application of protons to various disease sites. Figure 9.1 provides a helpful diagram illustrating that a proton beam's spread-out Bragg peak does not penetrate as deeply as a photon beam, a key feature of protons. The term "passing gamma" is used without definition.

Chapter 10 is about adaptive RT that allows adaptation of treatment plans to anatomical changes through an iterative process of imaging, contouring, plan adaptation, and quality assurance, which maintains conformal tumor dose coverage while avoiding irradiating organs at risk.

Chapter 11 is about artificial intelligence (AI) in radiation oncology, including natural language processing to extract useful information from medical records, AI in image segmentation to identify target volumes and organs at risk, and AI for treatment planning. The chapter does not discuss at a mathematical level how AI methods work but rather provides an overview of areas in which they have been used.

Chapter 12 is about immunotherapy (IO), including immune system components, vaccines, monoclonal antibodies, cytokines, chimeric antigen receptor T cells, immune checkpoint inhibitors (ICIs), immunotherapies that have been approved for various disease sites, and IO toxicities.

Chapter 13 is about radiation and combined modality therapy, including combining radiation with surgery or chemotherapy, and mechanisms of action and side effects of chemotherapeutics used in combination with RT.

Chapter 14 is about statistics used in the radiation oncology literature, including types of variables (e.g., continuous, counted, and categorical – ordinal and nominal), mean, standard deviation, median, range, a 2×2 table for displaying counts for a combination of a binary predictor's values and a binary outcome's values, relative risk, odds ratio, multiple regression (which is appropriately termed "multiple" rather than "multivariate" to refer to a multivariable regression model that has multiple predictor variables and one outcome variable) (Hidalgo and Goodman 2013), logistic regression, survival analysis, and certain study designs (i.e., trials, retrospective chart reviews, and meta-analysis). The language could be made more precise, for example by describing a false positive rate as a probability (or a sample estimate of this probability) of making a type I error rather than a type I error. A Box-Whisker plot is mentioned without illustration. Certain typographical errors are present. For example, to fit a model with a categorical predictor variable with c categories, one would need to include c minus 1 (i.e., "c-1" instead of "c1") dummy variables, log-"tank" should be log-"rank" test, and "postmarking" should be "post-marketing" or "postmarketing" when describing a surveillance study.

Part III Chapters 15 through 25 about clinical radiation oncology disease sites and Part IV Chapter 27 about palliative radiotherapy are structured in the following way: Sometimes relevant anatomy is discussed, followed by, for each subsite, workup, staging, treatment, RT technique (e.g., description and illustration of target volumes and associated diagnostic scans, dose fractionation regimens and OAR constraints with sources sometimes given for these, and axial,

sagittal, and/or coronal views of RT plans along with their DVHs or beam's eye view [BEV] images), outcomes (e.g., local control or survival percentages at particular time points after treatment), complications, and/or follow-up (e.g., visit frequency and scans to obtain at visits), and then the chapter ends with concise summaries of relevant chronological studies (e.g., clinical trials). Each study summary typically includes a table of key results. For disease sites focused on an anatomic region of the body, their chapters are ordered from head to toe.

Chapter 15 is about skin cancers, including non-melanoma skin cancer (basal cell and squamous cell carcinomas), malignant cutaneous melanoma, and merkel cell cancer. RT technique includes external beam (definitive and adjuvant to the primary site, and lymph node treatment), brachytherapy, photons, and electrons.

Chapter 16 is about primary brain cancers, including circumscribed astrocytic glioma, adult type diffuse glioma, brainstem glioma, optic glioma, ependymoma, meningioma, medulloblastoma, pituitary adenoma, and craniopharyngioma. Key molecular tests by tumor type are stated on page 195, like O^6-methylguanine-DNA methyltransferase (*MGMT*) promoter methylation for gliomas, though reasons for their importance are not given, like the prognostic importance of *MGMT* promoter methylation for malignant gliomas and methylation status being predictive for response to alkylating chemotherapy in glioblastoma (Weller et al. 2010). Brain MRI is importantly included in the workup, contouring, and follow-up of brain tumors. Images of proton dose distributions, NRG Oncology consensus contours for glioblastoma (PubMed Identifier or PMID 30888558) (Kruser et al. 2019), and RT plan cross sections and a DVH for glioblastoma are shown.

Chapter 17 is about head and neck cancers, beginning with a description of borders of head and neck subsites and lymph node borders with Figure 17.1 helpfully illustrating lymph node levels, and including oral cavity cancer, nasopharyngeal cancer, oropharyngeal and hypopharyngeal cancer, laryngeal cancer, nasal cavity and paranasal sinuses, parotid gland tumors, and unknown primary tumors. Epstein-Barr virus (EBV) is mentioned as a risk factor for nasopharyngeal cancer. Human papillomavirus (HPV) is mentioned as a risk factor for oral cavity, oropharyngeal, and hypopharyngeal cancers. The separate staging systems of HPV+ and HPV- oropharyngeal cancers are given, which is important given that HPV+ patients have better survival prognosis than HPV- patients. Head and neck can be particularly challenging to contour due to the multiple volumes that are simultaneously treated and variation in target volumes depending on subsite. Subclinical disease around the GTV and ipsilateral and/or contralateral neck lymph nodes to include in CTVs are described for each head and neck subsite.

Chapter 18 is about breast cancers, including a description of breast and lymph node borders by RTOG and ESTRO with Figure 18.1 illustrating lymph nodes, ductal carcinoma in situ (DCIS), early stage (I or II) breast cancer, post mastectomy radiotherapy (PMRT), locally advanced breast cancer, and recurrent breast cancer. Breast cancer is a disease site with an associated large literature that makes condensation challenging. Investigations include genomic assays like Oncotype DX DCIS and PreludeDx DCISionRT for DCIS and Oncotype DX for invasive breast cancer are mentioned. For DCIS, stated treatment options include breast conservation therapy (lumpectomy) with at least a 2-millimeter margin, no sentinel lymph node (SLN) dissection, and adjuvant RT to the whole breast or partial breast with a tumor bed boost. Conditions for omission of RT or boost or selection of partial versus whole breast adjuvant RT are given. Total mastectomy is given as a treatment option although this is less common than lumpectomy. For early stage breast cancer, stated treatment options include lumpectomy with no tumor on ink, SLN biopsy, followed by adjuvant RT to the whole breast with or without regional nodal irradiation (RNI) and tumor bed boost. Conditions are given for omission of full axillary dissection and addition of RNI. Page 263 gives examples of conventional, moderately hypofractionated, and ultrahypofractionated dose fractionation RT regimens, and accelerated partial breast irradiation (APBI) regimens. Moderately hypofractionated regimens are stated as the standard of care for whole breast RT for early-stage breast cancer with ultrahypofractionation, APBI, or omission of RT considered for selected patients with favorable risk factors. For high-risk node-negative tumors, chemotherapy options are stated and typically given prior to RT. For estrogen receptor-positive tumors, 5-year endocrine therapy options are given as tamoxifen typically for premenopausal patients and an aromatase inhibitor for postmenopausal patients. Trastuzumab for HER2-positive tumors, olaparib for germline BRCA1/2 mutations, and pembrolizumab with neoadjuvant chemotherapy for triple negative breast cancer are mentioned. For PMRT, stated treatment options include modified radical mastectomy, levels I-II axillary LN dissection, potential breast construction, adjuvant RT to the chest wall with or without RNI or scar line boost, chemotherapy before RT, and consideration of endocrine therapy and trastuzumab. For locally advanced breast cancer, stated treatment options include neoadjuvant chemotherapy followed by lumpectomy or mastectomy, surgical axilla staging, adjuvant RT to the breast or chest wall and RNI with practitioners varying in whether they include internal mammary lymph nodes. Systemic therapy options are given. For recurrent breast cancer, combinations of surgery, RT, and systemic therapy are considered with location of the recurrence and prior treatments influencing treatment options. Recent trials published in 2025 such as the interim analysis of the EUROPA trial comparing 5–10 years of endocrine therapy to 5–15 days of RT after breast-conserving surgery in terms of quality of life and ipsilateral breast tumor recurrence (PMID 39675376) (Meattini et al. 2025), INSEMA trial investigating omission of surgical axillary staging as part of breast-conserving therapy (PMID 39665649) (Reimer et al. 2025), and NSABP B-51 investigating omission of RNI after response to neoadjuvant chemotherapy (PMID 40466065) (Mamounas et al. 2025) are not included due to their publication after this book was published.

Chapter 19 is about thoracic cancers, including lymph node stations with an associated diagram of these, non-small

cell lung cancer (NSCLC), small cell lung cancer (SCLC, both limited stage and extensive stage), thymoma and thymic carcinoma, and malignant mesothelioma. Low-dose computing tomography (CT) screening, first line systemic options including tyrosine kinase inhibitors (TKIs) and immune checkpoint inhibitors depending on the presence or absence of certain mutations, and consideration of prophylactic cranial irradiation with or without hippocampal avoidance versus brain MRI surveillance for SCLC are included. How to conduct a CT simulation scan (e.g., motion management options including breath hold, gating, abdominal compression and 4-dimensional CT scans to delineate an ITV), that the ITV should include inspiratory and expiratory CTVs, and conventional 1.8 to 2 Gray per fraction and SBRT regimens are included.

Chapter 20 is about gastrointestinal cancers, including esophageal cancer, gastric cancer, pancreatic cancer, colorectal cancer, and anal cancer. For pancreatic cancer, stated treatment options depend on whether the tumor is resectable, borderline resectable, or unresectable. For colorectal cancer, investigations include mismatch repair protein tests. For anal cancer, IMRT volumes as per RTOG 0529 are described and cross sections of RT plans, a DVH, and a BEV are given. Chapter 21 is about genitourinary cancers, including renal cancer, bladder cancer, prostate cancer, and testicular cancer. For renal cancer, stated treatment options for Stages I-III disease include partial or radical nephrectomy and for Stage IV disease include cytoreductive nephrectomy and metastasectomy, immunotherapy or TKIs, and SBRT to the primary and to the solitary metastasis. For bladder cancer, stated treatment options are separated by whether the disease is superficial versus invasive and include transurethral resection of bladder tumor (TURBT) for both. Treatment options for superficial disease include consideration of TURBT followed by intravesicular Bacillus Calmette-Guerin (BCG) vaccine. Treatment options for invasive disease include bladder preservation management with maximum TURBT followed by concurrent chemoradiation. For prostate cancer, equations and nomograms for calculating the percent risk of pelvic lymph node involvement are given. Investigations to consider importantly include prostate-specific antigen (PSA), prostate MRI, transrectal ultrasound-guided biopsy with MRI prostate fusion and targeted prostate biopsies, prostate-specific membrane antigen (PSMA) positron emission tomography/computed tomography (PET/CT), which involves injecting a radioactive substance that targets the PSMA protein expressed by prostate cancer cells to aide in identifying prostate cancer on a scan, and calculation of life expectancy using Social Security Administration tables. The Decipher genetic risk score that is involved in certain clinical trials like NRG-GU010 is not included in the Investigations section. Gleason score-based grade groups are described and inform the definition of very low-risk, low-risk, favorable intermediate-risk, unfavorable intermediate-risk, high-risk, and very high-risk categories. These categories guide the choice of initial management options, which include active surveillance, radical prostatectomy (RP) with or without pelvic lymph node dissection, RT (external beam potentially with low dose rate or high dose rate brachytherapy), androgen deprivation therapy (ADT, either short-term such as 4–6 months or long-term such as 24–36 months), and the addition of abiraterone to ADT. Definitions of biochemical failure after initial treatment differ depending on whether the initial treatment involved prostatectomy (AUA definition) or RT (Phoenix definition). After initial treatment with prostatectomy, stated treatment options include adjuvant or salvage RT and ADT, and indications for adjuvant or salvage RT are given. After initial treatment with RT, stated treatment options include salvage brachytherapy, cryotherapy, high-intensity focused ultrasound (HIFU), prostatectomy, ADT, or orchiectomy. The challenge of prostatectomy after RT is not described. For testicular cancer, modified and conventional dogleg fields are described.

Chapter 22 is about gynecological cancers, including endometrial, cervical, ovarian, vaginal, and vulvar cancers. For endometrial cancer, estrogen and obesity are included as risk factors though the mechanism of obesity contributing to increased estrogen is not given. For cervical cancer, HPV is importantly included in the risk factors though HPV vaccination is not mentioned as a preventive strategy for the disease. Images of external beam and brachytherapy plans, as well as brachytherapy applicators are shown. Both intracavitary and interstitial brachytherapy are described.

Chapter 23 is about lymphoma and hematological cancers, including Hodgkin lymphoma (classical and nodular lymphocyte-predominant) and non-Hodgkin lymphoma. Symptoms and signs of lymphoma include systemic B symptoms involving weight loss, temperature > 38 degrees Celsius, and drenching night sweats. For Hodgkin lymphoma, investigations include PET/CT scans before, during, and after treatment. Staging includes an illustration of lymph node regions included in the Ann Arbor staging system. Early stage favorable, early stage unfavorable, and advanced stage groups are defined by the Ann Arbor stage and presence of certain risk factors (e.g., erythrocyte sedimentation rate, B symptoms, and number of nodal sites involved). These groups and the PET/CT Deauville score influence therapeutic options, which can involve involved site radiotherapy (ISRT). Non-Hodgkin lymphomas discussed include B-cell lymphoid proliferations and lymphomas (e.g., follicular lymphoma) and T-Cell and NK-Cell lymphoid proliferations and lymphomas (e.g., large B-cell lymphomas).

Chapter 24 is about soft tissue sarcomas. The workup section includes risk factors (e.g., inherited disorders like hereditary retinoblastoma or Li Fraumeni syndrome, radiotherapy, and chronic lymphedema), signs and symptoms (e.g., a painless growing lump that exerts symptoms via pressure or direct tumor invasion), and investigations (e.g., preference of core needle biopsy over excisional biopsy to avoid tumor seeding). Staging includes incorporation of the Fédération Nationale des Centers de Lutte Contre Le Cancer (FNCLCC) histologic grade. Treatments vary depending on stage and tumor location. The “RT Technique” section mentions fusion of an MRI in the radiation treatment position with the CT simulation scan for target delineation and

includes illustrations of radiation volumes and treatment planning magnetic resonance images. The section does not explicitly mention that to confidently cover a postoperative tumor bed, postoperative RT volumes can be larger than preoperative volumes, which is why some physicians prefer preoperative RT. 5-year local control and overall survival percentages are given by treatment (e.g., surgery alone, RT alone, or surgery and RT) or spread of disease. The most common complications include wound healing and fibrosis. Follow-up includes chest CT at each visit.

Chapter 25 is about pediatric cancers, including Hodgkin lymphoma, neuroblastoma, nephroblastoma (Wilm's tumor), rhabdomyosarcoma, Ewing's sarcoma, and retinoblastoma. Neuroblastoma arises from neural crest cells, typically in the adrenal glands or paraspinal sympathetic ganglia. Nephroblastoma, also known as Wilm's tumor, consists of renal cells and is the most common pediatric abdominal tumor. For nephroblastoma, Children's Oncology Group (COG) staging system, whole abdomen fields, and whole lung fields are shown. Rhabdomyosarcoma is made up of immature mesenchymal cells of striated muscles. Ewing's sarcoma comes from either mesenchymal or neuroectodermal cells and is most commonly located in the distal femur. Retinoblastoma is the most common childhood ocular malignancy. Complications of RT for pediatric patients include growth restriction and secondary malignancy.

Chapter 26 is about benign tumors. For each benign tumor, RT technique follows a description of the benign condition. Conditions include keloids, desmoid tumor/aggressive fibromatosis, Peyronie's disease, Dupuytren's contracture, gynecomastia, meningioma, pituitary adenoma, craniopharyngioma, acoustic neuroma, chordoma, glomus tumor, pterygium, Graves' ophthalmopathy, arteriovenous malformation/cavernous hemangioma, trigeminal neuralgia, Parkinson's disease, heterotopic ossification, and osteoarthritis.

Chapter 27 is about radiation emergencies and common indications for palliative RT, including brain metastases – Figure 27.2 provides representative axial slices of hippocampi contours, spinal cord compression, painful bone metastases, and superior vena cava syndrome.

Chapter 28 is largely about treatment-related toxicities with a focus on radiotherapy side effects and their management. There is grouping of toxicities by the site irradiated (e.g., skin, head and neck, thorax, breast, gastrointestinal tract, genitourinary, gynecological, and nervous system). The discussed toxicities are not all strictly due to radiotherapy and other therapies such as surgery or systemic therapy can contribute. Discussed toxicities include radiation dermatitis, mucositis, osteoradionecrosis, xerostomia, radiation pneumonitis, lymphedema, esophagitis, nausea or vomiting, diarrhea, weight loss, neurocognitive deficit, pain, and radiation fibrosis. For early radiation dermatitis, treatments include moisturizer and topical steroids. For desquamation, treatments include *Domeboro* soaks followed by topical *Silvadene* to prevent infection, or holding RT. Italics are used to separate generic from brand names. Certain abbreviations like "PPI" for proton pump inhibitor that are commonly used in the medical community are not defined. Smoking cessation and medications for anxiety and depression are also discussed.

In summary, this book impressively provides an overview of the radiobiology, physics, and clinical aspects of radiation oncology. Entire books have been devoted to each of these three parts of radiation oncology. Illustrations of relevant anatomy and images of target volumes and associated diagnostic scans, radiation treatment plan cross sections, DVHs, and BEVs are unique features not seen at all or as often in some other books about clinical radiation oncology (Trifiletti and Zaorsky 2019; Kocsis et al. 2025). Disease site-specific chapters in Part III are well-organized with a consistent structure. Since certain terms are used without prior definition (e.g., "positron", "wipe test", "TD5/5", "RLT", and "passing gamma") and are absent from the list of definitions for abbreviations near the end of the book, and since certain typographical errors are present (e.g., "log-tank test" in Chapter 14), the book is best understood by someone with some prior knowledge of these subjects or someone who can refer to another resource for further explanation. Perhaps due to length considerations, the book omits information like the existence of the Decipher risk score for prostate cancer and the HPV vaccine. Conciseness and comprehensiveness are competing interests. Other texts can be read for awareness of these omitted elements. Radiation oncology trainees and practicing radiation oncologists can use this as a three-in-one reference book for ABR radiation oncology board exam preparation or clinical usage.

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