

Library Current Awareness Bulletin Radiology – June 2022

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Section	Page(s)	
News	1	<p>Articles can be accessed from the links provided.</p> <p>An OpenAthens account may be required to access some of the articles. To create your free account please go to https://openathens.nice.org.uk/</p> 
Guidance	2	
Statistics	2	
Diagnostic Radiology	2-4	
Interventional Radiology	4-5	
Radiation Exposure	6	
Radiation Therapy	6-10	

News

[AI Update](#)

The Society of Radiographers, May 2022

[Society professional officer Tracy O'Regan gives an update on the current state of artificial intelligence and radiography.]

[Brady spells out how to write bad radiology reports](#)

Matthew Limb, AuntMinnieEurope.com contributing writer
May 2022

[Extended recognition for radiation protection professionals](#)

The Society of Radiographers, May 2022

[Lynda Johnson, SoR professional officer for clinical imaging, outlines the accreditation available.]

[Safer Radiotherapy e-Bulletin #7](#)

UK Health Security Agency, May 2022

[Social prescribing](#)

The Society of Radiographers, May 2022

[Radiography students Thailay Roscoe and Stephanie Edwards reveal how they used Twitter to raise awareness of social prescribing.]

Guidance

[Preventing Patient Identification Incidents in Diagnostic Imaging, Nuclear Medicine and Radiotherapy – guiding principles for safe practice in the United Kingdom](#)

The Society of Radiographers, May 2022

Statistics

[Diagnostic Imaging Dataset 2021-22 Data](#)

NHS England

March 2022

[The Diagnostic Imaging Dataset (DID) is a central collection of detailed information about diagnostic imaging tests carried out on NHS patients, extracted from local Radiology Information Systems (RISs) and submitted monthly.]

Diagnostic Radiology

[A fully automatic artificial intelligence-based CT image analysis system for accurate detection, diagnosis, and quantitative severity evaluation of pulmonary tuberculosis.](#)

Yan C., Wang L., Lin J., Xu J., Zhang T., Qi, J., Li X., Ni W., Wu G., Huang J., Xu Y., Woodruff H.C., and Lambin P.

European Radiology, vol. 32(4) pp. 2188-2199.

April 2022

[Objectives: An accurate and rapid diagnosis is crucial for the appropriate treatment of pulmonary tuberculosis (TB). This study aims to develop an artificial intelligence (AI)-based fully automated CT image analysis system for detection, diagnosis, and burden quantification of pulmonary TB. **Methods:** From December 2007 to September 2020, 892 chest CT scans from pathogen-confirmed TB patients were retrospectively included. A deep learning-based cascading framework was connected to create a processing pipeline. For training and validation of the model, 1921 lesions were manually labeled, classified according to six categories of critical imaging features, and visually scored regarding lesion involvement as the ground truth. A "TB score" was calculated based on a network-activation map to quantitatively assess the disease burden. Independent testing datasets from two additional hospitals (dataset 2, n = 99; dataset 3, n = 86) and the NIH TB Portals (n = 171) were used to externally validate the performance of the AI model. **Results:** CT scans of 526 participants (mean age, 48.5 ± 16.5 years; 206 women) were analyzed. The lung lesion detection subsystem yielded a mean average precision of the validation cohort of 0.68. The overall classification accuracy of six pulmonary critical imaging findings indicative of TB of the independent datasets was 81.08-91.05%. A moderate to strong correlation was demonstrated between the AI model-quantified TB score and the radiologist-estimated CT score. **Conclusions:** The proposed end-to-end AI system based on chest CT can achieve human-level diagnostic performance for early detection and optimal clinical management of patients with pulmonary TB.]

[Chest high-resolution computed tomography can make higher accurate stages for thoracic sarcoidosis than X-ray.](#)

Zhang Y., Du S-S., Zhao M-M., Li Q-H., Zhou Y., Song J-C., Chen T., Shi J-Y., Jie B., Li W., Shen Li., Zhang F., Su Y-L. et al
BMC Pulmonary Medicine, vol. 22(1): 1-8.

April 2022

[Background: To explore if chest high-resolution computed tomography (HRCT) can make higher accurate stages for thoracic sarcoidosis stage than X-ray (CRX) only. **Methods:** Clinical data from medical records of consecutive patients with a confirmed diagnosis of pulmonary sarcoidosis at Shanghai Pulmonary Hospital from January 1 2012 to December 31 2016 and consecutive patients treated at the Sarcoidosis Center of University of Cincinnati Medical Center, Ohio, USA from January 1 2010 to December 31 2015 were reviewed. The clinical records of 227 patients diagnosed with sarcoidosis (140 Chinese and 87 American) were reviewed. Their sarcoidosis stage was determined by three thoracic radiologists based on CXR and HRCT presentations, respectively. The stage determined from CXR was compared with that determined from HRCT. **Results:** Overall, 50.2% patients showed discordant sarcoidosis stage between CXR and HRCT (52.9% in Chinese and 44.8% in American, respectively). The primary reason for inconsistent stage between CXR and HRCT was failure to detect mediastinal lymph node enlargement in the shadow of the heart in CXR (22.1%) and small nodules because of the limited resolution of CXR (56.6%). Stage determined

from HRCT negatively correlated with carbon monoxide diffusing capacity (DLCO) significantly ($P < .01$) but stage determined from CXR did not. Pleural involvement was detected by HRCT in 58 (25.6%) patients but only in 17 patients (7.5%) by CXR. Patients with pleural involvement had significantly lower forced vital capacity and DLCO than patients without it (both $P < .05$). **Conclusion:** Revised staging criteria based on HRCT presentations included 5 stages with subtypes in the presence of pleural involvement were proposed. Thoracic sarcoidosis can be staged more accurately based on chest HRCT presentations than based on CXR presentations. Pleural involvement can be detected more accurately by HRCT.]

[Multi-label annotation of text reports from computed tomography of the chest, abdomen, and pelvis using deep learning](#)

D'Anniballe V.M., Tushar F.I., Faryna K., Han S., Mazurowski M.A., Rubin G.D., and Lo J.Y.

BMC Medical Informatics & Decision Making, vol. 22(1) pp. 1-12.

April 2022

[Background: There is progress to be made in building artificially intelligent systems to detect abnormalities that are not only accurate but can handle the true breadth of findings that radiologists encounter in body (chest, abdomen, and pelvis) computed tomography (CT). Currently, the major bottleneck for developing multi-disease classifiers is a lack of manually annotated data. The purpose of this work was to develop high throughput multi-label annotators for body CT reports that can be applied across a variety of abnormalities, organs, and disease states thereby mitigating the need for human annotation. **Methods:** We used a dictionary approach to develop rule-based algorithms (RBA) for extraction of disease labels from radiology text reports. We targeted three organ systems (lungs/pleura, liver/gallbladder, kidneys/ureters) with four diseases per system based on their prevalence in our dataset. To expand the algorithms beyond pre-defined keywords, attention-guided recurrent neural networks (RNN) were trained using the RBA-extracted labels to classify reports as being positive for one or more diseases or normal for each organ system. Alternative effects on disease classification performance were evaluated using random initialization or pre-trained embedding as well as different sizes of training datasets. The RBA was tested on a subset of 2158 manually labeled reports and performance was reported as accuracy and F-score. The RNN was tested against a test set of 48,758 reports labeled by RBA and performance was reported as area under the receiver operating characteristic curve (AUC), with 95% CIs calculated using the DeLong method. **Results:** Manual validation of the RBA confirmed 91-99% accuracy across the 15 different labels. Our models extracted disease labels from 261,229 radiology reports of 112,501 unique subjects. Pre-trained models outperformed random initialization across all diseases. As the training dataset size was reduced, performance was robust except for a few diseases with a relatively small number of cases. Pre-trained classification AUCs reached > 0.95 for all four disease outcomes and normality across all three organ systems. **Conclusions:** Our label-extracting pipeline was able to encompass a variety of cases and diseases in body CT reports by generalizing beyond strict rules with exceptional accuracy. The method described can be easily adapted to enable automated labeling of hospital-scale medical data sets for training image-based disease classifiers.]

[Radiograph report style preferences of referrers at a district general hospital in the West Midlands, England, UK](#)

Stevens B.J.

Radiography, vol. 28(2) pp. 296-303

May 2022

[Many articles and guidelines have been published proposing suggestions for the optimal radiology report style; it is likely that different referrers will prefer different styles owing to a number of clinical variables. The aim of this study is to assess the x-ray report style preferences of referrers at a district general hospital. This electronic survey study used convenience sampling. An email invitation was sent to all referrers who had requested imaging examinations in the six months prior to the study start date. Participants were asked their opinions on the inclusion of recommendations and advice and to indicate their preferences of mock reports with combinations of the following; short/long, in-depth/brief and paragraph/bullet points. Manual analysis was undertaken in Excel. There were 114 participants from the identified population of 356, giving a response rate of 32%. Nearly all participants find the inclusion of recommendations and advice to be useful ($n = 109, 96\%$). Seventy-nine participants (69.3%) request skeletal x-ray examinations, and 100 (87.7%) request chest x-ray examinations. More than half of skeletal referrers ($n = 42, 53.2\%$) and the majority of chest referrers ($n = 45, 45\%$) prefer reports with short sentences, brief, bullet point format. The most preferred report style for skeletal and chest x-ray reports is short sentences, brief with bullet-point format. These findings add to the current knowledge base and provide different report style options. Tailoring report styles could optimise service users' experience depending on clinical variables and might improve

reporting workflow. Potential differences in style preferences may exist between community and hospital referrers. Consequently, focussed research regarding the report style preferences of GPs is recommended as an area for further research.]

[Thoracic imaging tests for the diagnosis of COVID-19](#)

Ebrahimzadeh S., Islam N., Dawit H., Salameh J-P., Kazi S., Fabiano N., Treanor L., Absi M., Ahmad F., Rooprai P. et al *Cochrane Database of Systematic Reviews*, 2022, Issue 5. Art. No. CD013639.

May 2022

[Background: Our March 2021 edition of this review showed thoracic imaging computed tomography (CT) to be sensitive and moderately specific in diagnosing COVID-19 pneumonia. This new edition is an update of the review.

Objectives: Our objectives were to evaluate the diagnostic accuracy of thoracic imaging in people with suspected COVID-19; assess the rate of positive imaging in people who had an initial reverse transcriptase polymerase chain reaction (RT-PCR) negative result and a positive RT-PCR result on follow-up; and evaluate the accuracy of thoracic imaging for screening COVID-19 in asymptomatic individuals. The secondary objective was to assess threshold effects of index test positivity on accuracy. **Search methods:** We searched the COVID-19 Living Evidence Database from the University of Bern, the Cochrane COVID-19 Study Register, The Stephen B. Thacker CDC Library, and repositories of COVID-19 publications through to 17 February 2021. We did not apply any language restrictions.

Selection criteria: We included diagnostic accuracy studies of all designs, except for case-control, that recruited participants of any age group suspected to have COVID-19. Studies had to assess chest CT, chest X-ray, or ultrasound of the lungs for the diagnosis of COVID-19, use a reference standard that included RT-PCR, and report estimates of test accuracy or provide data from which we could compute estimates. We excluded studies that used imaging as part of the reference standard and studies that excluded participants with normal index test results. **Authors' conclusions:** Chest CT and ultrasound of the lungs are sensitive and moderately specific in diagnosing COVID-19. Chest X-ray is moderately sensitive and moderately specific in diagnosing COVID-19. Thus, chest CT and ultrasound may have more utility for ruling out COVID-19 than for differentiating SARS-CoV-2 infection from other causes of respiratory illness. The uncertainty resulting from high or unclear risk of bias and the heterogeneity of included studies limit our ability to confidently draw conclusions based on our results.]

Interventional Radiology

[Bibliometric analysis of interventional radiology studies in PubMed-indexed literature from 1991 to 2020](#)

Gowda P.C., Lobner K., Hafezi-Nejad N., and Weiss C.R.

Clinical Imaging, vol. 85 pp. 43-47

[Purpose: To evaluate interventional radiology (IR) research over time based on the study type of published articles and the visibility of articles to non-radiology clinicians. **Methods:** We performed a search of all PubMed-indexed literature from January 1, 1991, through November 11, 2020, for clinical IR articles classified by their study type, categorized as: 1) meta-analyses/systematic reviews/practice guidelines; 2) randomized controlled trials; 3) non-randomized controlled trials; and 4) longitudinal/observational studies. Clinical IR articles were defined as those that met keyword criteria constructed from Society of Interventional Radiology procedure guides. Data were also collected on medical specialty journal categories that published IR-related articles. **Results:** When we examined the first vs. the last decade of our study period, the number of IR articles published increased across all study types: randomized controlled trials (374 to 2620; 601% change), longitudinal/observational studies (2324 to 12,447; 436%), meta-analyses/systematic reviews/practice guidelines (1179 to 6135; 420%), non-randomized controlled trials (471 to 2161; 359%). The journal categories with the highest mean percentage increase of IR articles across all study types were obstetrics and gynecology (659%), peripheral vascular disease (342%), and emergency medicine (221%). We found a decrease of IR articles published in surgery (-6.0%), pediatrics (-14%), and pulmonary (-21%) journals.

Conclusion: The number of IR articles grew quickly and at a similar rate compared with all PubMed-indexed articles and increased as a proportion of articles published in non-imaging specialty journals. This indicates greater visibility of IR studies for all clinicians and is encouraging towards the advancement of IR techniques.]

[Safety and effectiveness of vascular closure devices in interventional radiological procedures](#)

Kim E., Sebastiao B.G., Lee A., Ande S. and Shankar J.

Interventional Neuroradiology

May 2022

[**Background:** Although it is well known that vascular closure devices (VCD) are commonly used in therapeutic interventional radiological procedures, standard use in diagnostic procedures is not as well studied. **Purpose:** The aim of this study was to determine the real-world safety and effectiveness of the VCD in both diagnostic and therapeutic interventional radiological procedures. **Materials and methods:** A retrospective, single center study included all patients where VCDs were used for either a diagnostic or therapeutic interventional procedure. Various demographic and clinical risk factors were recorded and examined for any significant association with successful deployment and complications. **Result(s):** A total of 2072 patients were included. VCDs were successfully deployed in 95.2% of the patients with 4.8% of perioperative complications, which included minor oozing from the puncture site, small hematoma less than or equal to 5 cm, large hematoma greater than 5 cm, pain, and loss of vascular access. Therapeutic (vascular interventional radiology (VIR) and neuro-interventional radiology (NIR)) procedures (OR 3.03, 95% CI 1.51-6.09, $p=0.002$), use of Angioseal (OR 5.26, 95% CI 3.13-8.33), $p<0.001$), and no use of antiplatelet medications (OR 0.47, 95% CI 0.22-0.97, $p=0.041$) were independently associated with successful deployment of VCDs when controlled for other risk factors. Smoking (OR 3.50, 95% CI 2.00-6.05, $p<0.001$), use of antiplatelet (OR 2.01, 95% CI 1.04-3.87, $p=0.037$) and use of heparin (OR 1.78, 95% CI 1.10-2.86, $p=0.018$) were independently associated with higher complication rates. **Conclusion(s):** VCD's were successfully deployed in 95.2% of the patients with 4.8% of perioperative minor complications.]

[The role of interventional radiology in the management of refractory bile leaks](#)

Arellano R.S., Reid N.J., Kapoor B. and Lorenz J.

Abdominal Radiology, vol. 47(5) pp. 1881-1890

May 2022

[Refractory bile leaks represent a damaging sequela of hepatobiliary surgery and direct trauma. Management of bile leaks represents a challenging clinical problem. Despite advances in endoscopic techniques, interventional radiology continues to play a vital role in the diagnosis and management of refractory bile leaks. This article reviews strategies for optimizing the diagnosis and management of bile leaks and provides an overview of management strategies, including the management of complicated biliary leaks.]

[Thromboelastography: a review for radiologists and implications on periprocedural bleeding risk](#)

Willis J., Carroll C., Planz V., and Galgano S.J.

Abdominal Radiology

May 2022

[Thromboelastography (TEG) and rotational thromboelastometry are emerging technologies that are gaining increasing acceptance in the medical field to evaluate the coagulation status of patients on an individual level by assessing dynamic clot formation. TEG has been proven to reduce blood product use as well as improve patient outcomes in a variety of medical settings, including trauma and surgery due to the expedited nature of the test as well as the ability to determine specific deficiencies present in whole blood that are otherwise undetectable with traditional coagulation studies. Currently, no guidelines or recommendations are in place for the utilization of TEG in interventional or diagnostic radiology although access to TEG has become increasingly common in recent years. This manuscript presents a review of prior literature on the technical aspects of TEG as well as its use in various fields and explains the normal TEG-tracing parameters. Common hemodynamic abnormalities and their effect on the TEG tracing are illustrated, and the appropriate treatments for each abnormality are briefly mentioned. TEG has the potential to be a useful tool for determining the hemodynamic state of patients in both interventional and diagnostic radiology, and further research is needed to determine the value of these tests in the periprocedural setting.]

Radiation Exposure

[Diagnostic radiological examinations and risk of intracranial tumours in adults-findings from the Interphone Study.](#)

Auvinen A., Cardis E., Blettner M., Moissonnier M., Sadetzki S., Giles G., Johansen C., Swerdlow A., Cook A. et al
International Journal of Epidemiology, vol. 51(2) pp. 537-546.

April 2022

[Background: Exposure to high doses of ionizing radiation is among the few well-established brain tumour risk factors. We used data from the Interphone study to evaluate the effects of exposure to low-dose radiation from diagnostic radiological examinations on glioma, meningioma and acoustic neuroma risk. **Methods:** Brain tumour cases (2644 gliomas, 2236 meningiomas, 1083 neuromas) diagnosed in 2000-02 were identified through hospitals in 13 countries, and 6068 controls (population-based controls in most centres) were included in the analysis. Participation across all centres was 64% for glioma cases, 78% for meningioma cases, 82% for acoustic neuroma cases and 53% for controls. Information on previous diagnostic radiological examinations was obtained by interviews, including the frequency, timing and indication for the examinations. Typical brain doses per type of examination were estimated based on the literature. Examinations within the 5 years before the index date were excluded from the dose estimation. Adjusted odds ratios were estimated using conditional logistic regression. **Results:** No materially or consistently increased odds ratios for glioma, meningioma or acoustic neuroma were found for any specific type of examination, including computed tomography of the head and cerebral angiography. The only indication of an elevated risk was an increasing trend in risk of meningioma with the number of isotope scans, but no such trends for other examinations were observed. No gradient was found in risk with estimated brain dose. Age at exposure did not substantially modify the findings. Sensitivity analyses gave results consistent with the main analysis. **Conclusions:** There was no consistent evidence for increased risks of brain tumours with X-ray examinations, although error from selection and recall bias cannot be completely excluded. A cautious interpretation is warranted for the observed association between isotope scans and meningioma.]

Radiation Therapy

[Efficacy of resistance training during adjuvant chemotherapy and radiation therapy in cancer care: a systematic review and meta-analysis](#)

McGovern A., Mahony N., Mockler D. and Fleming N.

Supportive Care in Cancer, vol. 30(5) pp. 3701-3719.

May 2022

[Purpose: To determine the effect of resistance training during adjuvant chemotherapy and radiation therapy in cancer patients on measures of lean mass and muscle strength. Secondary aims were to analyse the prescription and tolerability of supervised resistance training in this population. **Methods:** EMBASE, Medline, CINAHL, Cochrane Library and Web of Science were searched from inception until 29 March 2021. Eligible randomised controlled trials (RCTs) examining supervised resistance training > 6 weeks duration during adjuvant chemotherapy and/or radiation therapy in cancer patients with objective measurement of muscle strength and/or lean mass were included. The meta-analysis was performed using Revman 5.4. **Results:** A total of 1910 participants from 20 articles were included (mean age: 54 years, SD = 10) and the majority were female (76.5%). Resistance training was associated with a significant increase in upper body strength (standardised mean difference (SMD) = 0.57, 95% CI 0.36 to 0.79, I² = 64%, P < 0.0001), lower body strength (SMD = 0.58, 95% CI 0.18 to 0.98, I² = 91%, P = 0.005), grip strength (mean difference (MD) = 1.32, 95% CI 0.37 to 2.27, I² = 0%, P < 0.01) and lean mass (SMD = 0.23, 95% CI 0.03 to 0.42, I² = 0%, P = 0.02). A P value of < 0.05 was considered statistically significant. The quality of the studies included was moderate to high with low risk of bias as per the PEDro scale. **Conclusion:** Resistance training is an effective adjunct therapy to improve muscle strength and lean mass in cancer patients undergoing chemotherapy and/or radiation therapy.]

[Feasibility of postoperative spine stereotactic body radiation therapy in proximity of carbon and titanium hybrid implants using a robotic radiotherapy device.](#)

Henzen D., Schmidhalter D., Guyer G., Stenger-Weisser A., Ermiş E., Poel R., Deml M.C., Fix M.K., and Manser P. *Radiation Oncology*, vol. 17(1): 1-12.

May 2022

[Background and Purpose: To assess the feasibility of postoperative stereotactic body radiation therapy (SBRT) for patients with hybrid implants consisting of carbon fiber reinforced polyetheretherketone and titanium (CFP-T) using CyberKnife. **Materials and Methods:** All essential steps within a radiation therapy (RT) workflow were evaluated. First, the contouring process of target volumes and organs at risk (OAR) was done for patients with CFP-T implants. Second, after RT-planning, the accuracy of the calculated dose distributions was tested in a slab phantom and an anthropomorphic phantom using film dosimetry. As a third step, the accuracy of the mandatory image guided radiation therapy (IGRT) including automatic matching was assessed using the anthropomorphic phantom. For this goal, a standard quality assurance (QA) test was modified to carry out its IGRT part in presence of CFP-T implants. **Results:** Using CFP-T implants, target volumes could precisely delineated. There was no need for compromising the contours to overcome artifact obstacles. Differences between measured and calculated dose values were below 11% for the slab phantom, and at least 95% of the voxels were within 5% dose difference. The comparisons for the anthropomorphic phantom showed a gamma-passing rate (5%, 1 mm) of at least 97%. Additionally the test results with and without CFP-T implants were comparable. No issues concerning the IGRT were detected. The modified machine QA test resulted in a targeting error of 0.71 mm, which corresponds to the results of the unmodified standard tests. **Conclusion:** Dose calculation and delivery of postoperative spine SBRT is feasible in proximity of CFP-T implants using a CyberKnife system.]

[Improving Patients' Life Quality after Radiotherapy Treatment by Predicting Late Toxicities.](#)

Lapierre A., Bourillon L., Larroque M., Gouveia T., Bourgier C., Ozsahin M., Pèlerin A., Azria D., and Brengues, M. *Cancers*, vol. 14(9)

May 2022

[Simple Summary: Over 50% of patients with cancer will receive radiotherapy treatment. Five to ten percent of patients who received radiotherapy will develop side effects. Identifying these patients before treatment start would allow for treatment modification to minimize these effects and improve the life quality of these patients. Our team developed a test, which allows predicting these secondary effects before starting the treatment. This will help in proposing personalized treatments to improve the outcome. This review presents how this test is performed, its results, as well as its modification in order to be used in hospitals. Personalized treatment and precision medicine have become the new standard of care in oncology and radiotherapy. Because treatment outcomes have considerably improved over the last few years, permanent side-effects are becoming an increasingly significant issue for cancer survivors. Five to ten percent of patients will develop severe late toxicity after radiotherapy. Identifying these patients before treatment start would allow for treatment adaptation to minimize definitive side effects that could impair their long-term quality of life. Over the last decades, several tests and biomarkers have been developed to identify these patients. However, out of these, only the Radiation-Induced Lymphocyte Apoptosis (RILA) assay has been prospectively validated in multi-center cohorts. This test, based on a simple blood draught, has been shown to be correlated with late radiation-induced toxicity in breast, prostate, cervical and head and neck cancer. It could therefore greatly improve decision making in precision radiation oncology. This literature review summarizes the development and bases of this assay, as well as its clinical results and compares its results to the other available assays.]

[Optimal Clinical Target Volume of Radiotherapy Based on Microscopic Extension around the Primary Gross Tumor in Non-Small-Cell Lung Cancer: A Systematic Review.](#)

Tamaki Y., Aibe N., Komiyama T., Nagasaka S., Imagumbai T., Itazawa T., Onishi H., Akimoto T., Nagata Y. et al *Cancers*, vol. 14(9)

[Simple Summary: As radical radiation therapy for non-small-cell lung cancer becomes increasingly precise following the development of techniques such as image-guided radiotherapy and intensity-modulated radiotherapy, how we define the clinical target volume (CTV) is crucial. Although assessing the scope of microscopic extension and microscopic proximal bronchial extension from the primary tumor is critical for defining the CTV, there is currently no consensus on this issue. Accordingly, we conducted this systematic review with the aim of assessing the available evidence. Although there were few studies with a high level of evidence, this systematic review enabled us to collate the available results and to provide some recommendations regarding suitable CTV margins. A crucial issue in radical radiation therapy for non-small-cell lung cancer is how to define the clinical target volume (CTV). Although the scope of microscopic extension (ME) and microscopic proximal bronchial extension (PBE) from a primary tumor should be considered when defining the CTV, there has been limited research on ME and PBE. Therefore, we conducted this systematic review. The PubMed, ICHUSHI (Japanese database), and Cochrane Library databases were searched, and 816 articles were initially retrieved. After primary and secondary screenings, eight articles were ultimately selected. The results of this systematic review suggest the importance of a 0 mm margin in stereotactic radiotherapy for early-stage cancer and a 5–8 mm margin in curative irradiation for locally advanced cancer. Regarding PBE, this review yielded the conclusion that it is appropriate to consider the addition of an approximately 15 mm margin from the bronchial vasculature. Although there were few articles with a high level of evidence, this systematic review enabled us to collate results from previous studies and to provide recommendations, to some extent, regarding the CTV margin in the current clinical environment, where high-precision radiation therapy, such as image-guided radiotherapy and intensity-modulated radiotherapy, is predominant.]

[Perihippocampal failure after hippocampal-avoidance whole-brain radiotherapy in cancer patients with brain metastases: Results of a retrospective analysis](#)

Shieh L-T., Lee S-W., Chen C-C., Ho Y-C., Wang Y-W., and Ho S-Y.

Medicine, vol. 101(14) pp. 1-7.

April 2022

[Abstract: Perihippocampal failure is a rare clinical scenario in brain metastatic cancer patients following hippocampal-avoidance (HA) whole-brain radiotherapy (HA-WBRT). The clinical features have not been fully identified because clinical data on intracranial failure after HA-WBRT are limited. It is thus necessary to accumulate clinical data. We retrospectively analyzed cancer patients with brain metastases who were diagnosed between January 2014 and September 2020 at a regional referral hospital. The medical records of patients who underwent HA-WBRT were reviewed. The clinical features of intracranial recurrence were described. Dosimetry parameters were compared in terms of deviation from the recommended protocol of the Radiation Therapy Oncology Report 0933. Twenty-four eligible patients with brain metastases who underwent HA-WBRT were identified; 13 (54%) were male. Seventeen patients (71%) had lung cancer, 6 (25%) had breast cancer, and 1 (4%) had liver cancer. The median overall survival was 12 months. Three patients developed intracranial failure during clinical follow-up, and 2 relapsed with intracranial failure in the perihippocampal region at 13 and 22 months, respectively. The perihippocampal failure rate was about 8%. One patient with small cell lung cancer received HA-prophylactic cranial irradiation; the minimum and maximum doses to the hippocampi were 6.8 and 10.7 Gy, respectively. Another patient with brain metastases from lung adenocarcinoma received HA-WBRT; the minimum and maximum doses to the hippocampi were 5.4 and 10.6 Gy, respectively. We reported unusual cases of intracranial failure in the perihippocampal region following HA-WBRT. Perihippocampal failure could be attributed to an under-dose of radiation partially or be resulted from aggressiveness of cancer per se. Further research on this topic is encouraged.]

[Preventive Effect of Hippocampal Sparing on Cognitive Dysfunction of Patients Undergoing Whole-Brain Radiotherapy and Imaging Assessment of Hippocampal Volume Changes.](#)

Shang W., Yao H., Sun Y., Mu A., Zhu L., and Li X.

BioMed Research International

April 2022

[Objective: Preventive effect of hippocampal sparing on cognitive dysfunction of patients undergoing whole-brain radiotherapy and imaging assessment of hippocampal volume changes. **Methods:** Forty patients with brain metastases who attended Liaoning Cancer Hospital from January 2018 to December 2019 were identified as research subjects and were randomly divided into a control group and an experimental group, with 20 cases in each group. The control group was treated with whole-brain radiotherapy (WBRT), and the experimental group was treated with hippocampal sparing-WBRT (HS-WBRT). The Montreal Cognitive Assessment (MoCA) score, Eastern Cooperative Oncology Group (ECOG) score, cancer quality-of-life questionnaire (QLQ-C30) score, hippocampal volume changes, and prognosis of the two groups were compared. **Results:** The MoCA scores decreased in both groups at 3, 6, and 12 months after radiotherapy, with significantly higher scores in the experimental group than in the control group ($P < 0.05$). After radiotherapy, both groups had lower ECOG scores, with those in the experimental group being significantly lower than those in the control group ($P < 0.05$). After radiotherapy, the QLQ-C30 score was elevated in both groups, and that of the experimental group was significantly higher than that of the control group ($P < 0.05$). The experimental group outperformed the control group in terms of the prognosis ($P < 0.05$). The hippocampal volume of the control group was significantly smaller than that of the experimental group ($P < 0.05$). **Conclusion:** The application of hippocampal sparing in patients receiving whole-brain radiotherapy is effective in preventing cognitive dysfunction, improving the quality of life and prognosis of patients, and avoiding shrinkage of hippocampal volume.]

[Sinonasal Side Effects of Chemotherapy and/or Radiation Therapy for Head and Neck Cancer: A Literature Review](#)

Riva G., Cravero E., Pizzo C., Briguglio M., Iorio G.C., Cavallin C., Ostellino O., Airolidi M., Ricardi Umberto et al
Cancers, 14(9)
May 2022

[Simple Summary: Rhinosinusitis and smell alterations are common side effects during and after radiotherapy and chemotherapy for head and neck cancer. The assessment of sinonasal complaints is important to increase patients' quality of life. The aim of this review is to summarize and analyze our current knowledge of the sinonasal side effects of chemotherapy and/or radiation therapy for head and neck cancer, with a specific focus on mucosal and olfactory disorders. Radiotherapy and chemotherapy represent important treatment modalities for head and neck cancer. Rhinosinusitis and smell alterations are common side effects in the sinonasal region. This review will summarize and analyze our current knowledge of the sinonasal side effects of chemotherapy and/or radiation therapy for head and neck cancer (HNC), with a specific focus on mucosal and olfactory disorders. A review of the English literature was performed using several databases (PubMed, Embase, Cochrane, Scopus). Fifty-six articles were included in qualitative synthesis: 28 assessed mucosal disorders (rhinitis or rhinosinusitis), 26 evaluated olfactory alterations, and 2 articles addressed both topics. The incidence and severity of olfactory dysfunction and chronic rhinosinusitis were highest at the end of radiotherapy and at three months after treatment and decreased gradually over time. Smell acuity deterioration and chronic rhinosinusitis seemed to be related to radiation dose on olfactory area and nasal cavities, but different degrees of recovery were observed. In conclusion, it is important to establish the severity of chronic rhinosinusitis and olfactory dysfunction in order to find strategies to support patients and improve their quality of life.]

[The Cost-Effectiveness of Selective Internal Radiation Therapies Compared With Sorafenib for Treating Advanced Unresectable Hepatocellular Carcinoma in the United Kingdom](#)

Claxton L., Walton M., Sharif-Hurst S., Wade R., Eastwood A., Hodgson R.
Value in Health, vol. 25(5) pp.787-795
May 2022

[Objectives: To assess the cost-effectiveness of selective internal radiation therapy (SIRT) compared with sorafenib for the treatment of patients with advanced hepatocellular carcinoma in the United Kingdom, including a selected subgroup of patients who have been identified as benefiting from treatment with SIRT. **Methods:** A de novo economic model was developed comparing SIRT with sorafenib using data from two large randomized controlled

trials. The model structure comprised a decision tree representing the outcome of the work-up procedure, transitioning into a 3-state partitioned survival model to project long-term survival outcomes. Cost-effectiveness in a post hoc defined subgroup with low tumor burden and good liver function was explored. **Results:** At list price, SIRT was predicted to be less costly but less effective than sorafenib with an estimated saving of £156 089 per quality-adjusted life-year forgone, with cost savings of £4589 and 0.029 fewer quality-adjusted life-years than sorafenib. Accounting for existing confidential discounts for sorafenib, two SIRTs were cost-effective at a £30 000 willingness-to-pay threshold compared with sorafenib when a discount for the technologies was introduced. In the subgroup with low tumor burden and good liver function, SIRT may be associated with greater survival benefits and cost savings. **Conclusions:** Accounting for confidential discounts, on average, SIRT technologies represent value for money in the whole advanced hepatocellular carcinoma population, being less effective but less costly than sorafenib. Results from a subgroup with low tumor burden and good liver function suggest that the cost-effectiveness of SIRTs may be maximized in this group, but further research is required to demonstrate the validity of effectiveness benefits.]

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