irradiation. Medihoney should be considered as another option to standard care treatment in breast patients receiving adjuvant radiation therapy.


### 3171

**Accumulated Tumor Volume Threshold Correlates With Neurologic Outcomes in Patients With Brain Metastases Treated With Radiosurgery**

**Purpose/Objective(s):** Brain metastases occur in 10 to 30 percent of primary non-CNS cancer patients. Recent prospective studies have demonstrated non-inferiority when comparing up to ten metastases, total cumulative volume <15cc treated with stereotactic radiosurgery (SRS) compared to whole brain radiation therapy (WBRT). In addition, the combination of WBRT to SRS is associated with diminished cognitive function and worse patient-reported quality of life. This study analyzes neurologic outcomes as it relates to volume of intracranial lesions treated with SRS.

**Materials/Methods:** A retrospective analysis of hospital records at Virginia Hospital Center for patients with brain metastases who underwent stereotactic radiation treatment between June 2008 and June 2014 was performed. Previous treatment history, metastatic tumor dimensions, and outcomes were recorded. Predictors of neurologic defects, local tumor progression, and overall survival were assessed with univariate and multivariate analysis.

**Results:** We identified 127 adult patients (67% male) with a median age of 61.5 years and a median follow-up of 6.6 months. Worsening neurologic defects showed an association with an increased number of lesions (p <.02), increasing age (p <.05), and an accumulated tumor volume greater than the median volume of 7cc (p <.05). For local tumor progression, patients who received WBRT were less likely to progress (74, 95%, CI .49, 1.10), while those who received chemotherapy (1.48 95%, CI 1.00, 2.24), or surgery (1.40 95%, CI .88, 2.16) without WBRT were more likely to progress. Increasing number of lesions treated with radiosurgery (p <.05) was the only factor associated with poor patients’ survival.

**Conclusion:** Our data suggest that an accumulated tumor volume limit of 7cc correlates with worse neurologic outcomes following radiosurgery. In addition, WBRT appears to have a role in improved survival for patients with increased tumor burden. A prospective study is warranted to validate these findings.

**Author Disclosure:** R.L. Hong: None. I.K. Kim: None. R. Starke: None. D. McAree: None. G. Cernica: None. N.M. Nasr: None. A. Caputy: None. J. Sherman: None.

### 3172

**Fractionated External Beam Radiation Therapy for Skull Base Metastases With Cranial Nerve Involvement**

**Purpose/Objective(s):** Skull base metastases (SBM) have rarely been clinically diagnosed. Nonetheless, they induce severe pain and/or neurological disorders which strongly impair patient’s quality of life. This retrospective study analyzed fractionated external beam radiation therapy (EBRT) as a palliative treatment with emphasis on neurological outcome.

**Materials/Methods:** A retrospective review was performed of adult patients with SBM with cranial nerve involvements who received EBRT between 2003 and 2013. MR images were taken for all patients to detect involved lesions. Neurological status and pain score were assessed before radiation therapy and four weeks after. Neurological outcome was scored as persistence of symptoms, partial response, and good / complete response. Treatment-related toxicity and overall survival were assessed.

**Results:** Forty-one SBM patients with neurological deficit were identified. Median age was 63 years (range: 33-83 years). Primary tumors (number of patients) were breast (10), prostate (9), lung (8), and other cancers (14). According to Greenberg, the majority of lesions localized in the orbital (3), paraseellar (19), middle-fossa (8), jugular foramen (4), and occipital condyle (7). Median time from the onset of symptoms to irradiation was 19 days (range: 4-217 days). Median radiation dose was 30 Gy (range: 30-50 Gy), and fraction number was 10 (range: 10-25). The planned radiation therapy course was completed by 40 (97%) patients; acute toxicities were mild except for one patient with grade 3 radiation sickness. Of 29 patients whose neurological symptoms were evaluable four weeks after radiation therapy, 12 patients (41%) showed significant improvement of their symptoms. Other 12 patients (41%) improved slightly, 5 patients (17%) remained same. For ocipital neuralgia, none reported improvement. The symptoms of lower cranial nerves showed less improvements than other cranial nerve symptoms (73.3% vs 92.6%, p = 0.08). No significant differences were observed in symptom improvement according to histological types, time from the onset to irradiation, total radiation doses. Nine (22%) patients experienced intracranial recurrence, two of nine with in-field recurrence. Median survival time since initiation of RT was 4.0 months (range: 0.2-100.1 months). On univariate analysis, Karnofsky Performance status (KPS) ≥ 70 was a prognostic factor associated with longer overall survival.

**Conclusion:** Fractionated EBRT for 41 patients with SBM demonstrated successful symptomatic improvements with high feasibility and low toxicity. These findings suggest EBRT as an effective therapeutic treatment in the palliative setting for patients with symptomatic SBM.


### 3173

**Outpatient Palliative Care Needs of Metastatic Cancer Patients Treated With Radiation Therapy**

**Purpose/Objective(s):** To examine the burden of unmet physical, psychological, spiritual, and practical needs of patients with metastatic disease who have completed a course of radiation treatment; and to determine the level of support needed for an outpatient palliative care service.

**Materials/Methods:** We performed a telephone survey to evaluate the unmet needs of living patients with stage IV metastatic cancer treated with radiation therapy at a single institution within the past six months. Data were collected using the Palliative care Outcome Scale, a validated 12-question survey about unmet patient needs, as well as its associated symptom scale. We also examined patients’ treatment histories by reviewing medical records. Among an initial group of 87 eligible patients treated, 45 had died, 19 were unable to be reached, and two declined participation. Thus, 21 patients were included in the preliminary analysis.

**Results:** Diagnosis varied, with the most frequent being lung (24%; 5/21). Most patients had received their recent radiation course was completed by 40 (97%) patients; acute toxicities were mild except for one patient with grade 3 radiation sickness. Of 29 patients whose neurological symptoms were evaluable four weeks after radiation therapy, 12 patients (41%) showed significant improvement of their symptoms. Other 12 patients (41%) improved slightly, 5 patients (17%) remained same. For ocipital neuralgia, none reported improvement. The symptoms of lower cranial nerves showed less improvements than other cranial nerve symptoms (73.3% vs 92.6%, p = 0.08). No significant differences were observed in symptom improvement according to histological types, time from the onset to irradiation, total radiation doses. Nine (22%) patients experienced intracranial recurrence, two of nine with in-field recurrence. Median survival time since initiation of RT was 4.0 months (range: 0.2-100.1 months). On univariate analysis, Karnofsky Performance status (KPS) ≥ 70 was a prognostic factor associated with longer overall survival.

**Conclusion:** Fractionated EBRT for 41 patients with SBM demonstrated successful symptomatic improvements with high feasibility and low toxicity. These findings suggest EBRT as an effective therapeutic treatment in the palliative setting for patients with symptomatic SBM.

reported more symptoms and increased symptom severity, but 44% of patients reported moderate pain even among those not undergoing radiation therapy or chemotherapy.

Conclusion: Patients with metastatic cancer recently treated with radiation therapy continue to have substantial needs that are frequently not being met by standard oncologic care, despite recent visits with physicians. Although many of these patients are receiving chemotherapy and may be identified for palliative care programs through the medical oncology service, radiation oncology clinics should also routinely integrate quality palliative care for patients with metastatic cancer.


3174

Inpatients Who Received Palliative Radiation Therapy: Status Survey
S. Chawla,1 C. Easterly,1 S. Tenjarla,2 and A. Herman1; 1Rochester Regional Health System, Rochester, NY; 2D.Y. Patil Medical College, Hospital and Research Centre, Pune, India

Purpose/Objective(s): About 30-50% of patients referred for radiation therapy are treated with palliative intent. The purpose of this study was to investigate patterns of palliative radiation therapy (RT) in inpatients and their outcome.

Materials/Methods: Sixty-eight patients admitted with advanced or metastatic cancer treated with palliative RT between January 2013 and December 2013 were analyzed. Demographic details were obtained. Treatment course and outcome were evaluated using medical records. Univariate analyses were performed by using the 2-sided chi-square test.

Results: Median age was 70 years (range 24-96 years). Median KPS was 60(range 50-80). Most common primary sites were lung (46%), breast (10%), genitourinary (10%) and others (34%). Metastases were present in bone (40%), brain (38%), and the rest were primary sites (22%). Charlson comorbidity score was >2 in most patients. Most common radiation therapy schedule was 30 Gy in 10 fractions. Median elapsed days of RT were 13 (range 0-75 days). Median survival of all patients was 47 days. Single fraction RT was given in one patient and radiosurgery of brain in 2 patients. Twenty nine patients (43%) lived for <30 days, 9 patients (13%) lived for >30 days and<60 days, 20 patients (29%) lived for > 60 days and<6months and 10 patients (15%) lived for >6 months. Thirty nine patients (57%) were discharged to hospice. Therapy was prematurely discontinued in 23% of patients because of early death or deteriorating health status. Only marital status conveyed a poor survival on univariate analysis (p = .009) and KPS (p = .57), age (p = .87), sex (p = .40) race (p = .06), rural vs. urban status (p = .67) and treatment site (p = .18) did not.

Conclusion: As demonstrated in other studies from United States, single fraction radiation therapy for palliation was undertreated in this study. More than 50% of patients died within 60 days of diagnosis and about one fourth of patients spent remaining end of life receiving palliative RT. Future research is needed to identify barriers to shorter courses of radiation, prognostic models should be used to tailor course of palliative radiation therapy and very sick patients should be offered an option of comfort care.

Author Disclosure: S. Chawla: None. C. Easterly: None. S. Tenjarla: None. A. Herman: None.

3175

Frequency of Distal Bone Metastases in Patients Treated for Palliative Radiation Therapy and Associations With Primary Tumor Types
M. Barnes,1 M.S. Tiwana,1 A. Kiraly,2 M. Hutchison,1 and R.A. Olson1; 1BC Cancer Agency, Prince George, BC, Canada, 2University of Northern BC, Prince George, BC, Canada

Purpose/Objective(s): This study assesses the incidence of distal bone metastases in palliative radiation therapy patients.

Materials/Methods: All courses of RT for bone metastases from 2007-2011 for patient living in BC were identified in a provincial RT program. Treated bone metastases (BoM) were categorized as distal if the BoM was located within or distal to the elbow or knee. Patients were grouped by primary tumor site as breast, lung, prostate gastrointestinal, hematological, melanoma, and other. The incidence of distal bone metastases and associations with primary tumor types were determined.

Results: From 2007-2011, 8008 patients were treated with 16,277 courses of RT, of which 425 (2.6%) were courses of RT for distal BoM (p<.001). The incidence of distal BoM in decreasing order by primary tumor type was melanoma (5%), hematological (3%), lung (2%), other (2%), prostate (2%), breast (1%) and gastrointestinal (1%). Distal BoM where more commonly identified in the lower extremity (87%). Single fraction RT was used more commonly for distal vs non-distal BoM (60% vs. 40%; p<.001). Multi-variable analysis revealed the incidence of distal BoM was significantly higher in melanoma malignancies (OR = 2.45 compared to breast; p = .011) and lower for male patients (OR = 0.74; p = .035).

Conclusion: The incidence of distal BoM among patients treated with palliative RT was 2.6% and most commonly identified in patients with melanoma and hematological malignancies.


3176

How, When and Where to Discuss Do Not Resuscitate: A Prospective Study to Compare the Perceptions and Preferences of Patients, Caregivers, and Health Care Providers in a Multidisciplinary Lung Cancer Clinic
N. Ahmed,1 M. Lobchuk,2 W. Hunter,1 P. Johnston,2 Z. Nugent,1 A.M. Sharma,1 S. Ahmed,1 and J. Sisler2; 1CancerCare Manitoba, University of Manitoba, Winnipeg, MB, Canada, 2Faculty of Nursing, University of Manitoba, Winnipeg, MB, Canada, 3Department of Epidemiology and Cancer Registry, CancerCare Manitoba, University of Manitoba, Winnipeg, MB, Canada, 4CancerCare Manitoba, Winnipeg, MB, Canada

Purpose/Objective(s): Do Not Resuscitate (DNR) is a significant but challenging part of end of life discussions when dealing with incurable lung cancer patients. We have attempted to explore the perceptions and preferences of patients, their caregivers (CGs) and health care providers (HCPs), and the current practice and opinions on DNR discussion in a multidisciplinary lung cancer clinic.

Materials/Methods: This is a prospective descriptive study with a mixed quantitative and qualitative methodology to capture perceptions of the participants. To obtain a rich description of participant responses to questionnaire items, we employed a “think aloud” process that prompted participants to immediately verbalize their thoughts when responding to questionnaire items. We used content analysis and constant comparison techniques to identify, code, and categorize primary themes in the captured data.

Results: Ten patients with advanced staged lung cancer; nine CGs from the lung clinic, and ten HCPs from the Thoracic Disease Site Group (DSG) were enrolled in the study. Most patients had only a limited understanding of DNR. Most CGs had a fair to good understanding of DNR. Most HCPs perceived their patients to have understood DNR most of the time. When patients were interviewed, a theme of “anticipated discussion” about DNR was identified. Patients and CGs expressed having faith in the system and responsible physicians as to when to discuss DNR. HCPs embraced a clinician preference-based decision-making approach to engage in DNR discussions. They desired more resources, more knowledge, more structure, and more time to discuss DNR. Most HCPs felt that it would be worth conducting a prospective clinical trial to determine the best time to discuss DNR.