# Supporting Material

Table S1. Radiation therapy studies providing insight on the effect of age on acute radiation effects.

| **Study** | **Design/Population** | **Endpoints** | **Results/Findings** |
| --- | --- | --- | --- |
| ***Pediatric*** |  |  |  |
| Radiation-related treatment effects across the age spectrum: Differences and similarities or What the old and young can learn from each other (Krasin et al. 2010) | Adults and children. | Review comparing general differences in treatment effects in both children and adults. | Radiation related effects in children and adults limit the delivery of effective radiation doses and result in long-term morbidity affecting function. **Effects depend on the target organ.** |
| Sources, effects, and risks of ionizing radiation. (UNSCEAR 2013) | Children/ adolescents. | Review analyzing data, results, and literature of radiation effects in the pediatric population. | Generally, **children are at more risk of radiation health effects than are adults**. |
| ***Adults*** |  |  |  |
| Correlation between delivered radiation doses to the brainstem or vestibular organ and nausea & vomiting toxicity in patients with head and neck cancers – an observational clinical trial (Schiller et al. 2017) | 26 patients receiving NSCLC to the brainstem and vestibular system. | Nausea and vomiting. 65.4% experienced nausea and vomiting at least once during treatment. | Females and **younger** **aged patients were more prone to nausea and vomiting**. |
| Influence of age, prior abdominal surgery, fraction size, and dose on complications after radiation therapy for squamous cell cancer of the uterine cervix. (Lanciano et al. 1992) | 1558 patients were reviewed, with a median follow-up of 43 months. | Analysis of complications in regards to treatment by radiotherapy. | **Patients under 40 years were associated with an increase in complications** from radiotherapy as compared to those over 40. |
| ***Elderly*** |  |  |  |
| Radiation-induced organizing pneumonia after stereotactic body radiotherapy for lung tumor (Ochiai et al. 2015) | 78 patients (47 males with median age of 80 years old), median follow-up of 23 months, treatment was stereotactic body radiotherapy (SBRT). | Organizing pneumonia (OP) following stereotactic body radiotherapy. | 6.4% developed OP at 6-18 months after SBRT. 8.2% at one and two years respectively. Radiation-induced organizing **pneumonia was observed in this elderly population**. |
| Comorbidity assessment and radiotherapy in elderly cancer patients (Fiorica et al. 2012) | Review of findings from the treatment of elderly patients with non-small cell lung cancer, rectal cancer, breast, and prostate cancer. | Comparison of geriatric index of comorbidity [GIC], adult comorbidity evaluation-27 [ACE-27], cumulative illness rating scale for geriatrics [CIRS-G] and the Charlson index, cumulative illness rating scale. | Patients without or with mild comorbidities had a significantly better survival than patients with moderate/severe comorbidities. Increasing severity of **comorbidities may shorten life expectancy and increase acute toxicity.** |
| Stereotactic body radiotherapy for very elderly patients with stage I non-small cell lung cancer (Hayashi et al. 2014) | 81 patients (elderly; median age, 80 years; age range 64–93 years) with stage 1 non-small cell lung cancer. | Data from stereotactic body radiotherapy and its effects on elderly populations. | Radiotherapy was deemed feasible and efficacious in elderly but, elderly patients did experience **significantly more severe radiation pneumonitis**. |
| Greater influence of age than comorbidity on primary treatment and complications of prostate cancer patients: an in-depth population-based study (Lanciano et al. 1992) | Random sample of 505 prostate cancer patients. | Data comparing patients with and without comorbidities on prostate cancer outcomes. | Prostate cancer patients with comorbidity did not suffer from more complications but had a **worse prognosis**. |
| Symptomatic radiation pneumonitis in elderly patients receiving thoracic irradiation (Kharofa and Gore 2013) | There were 99 patients > age 70 and 157 patients age < 70 years old. | Data on incidence of pneumonitis after radiation therapy. | Elderly patients were observed to have an **increased risk of symptomatic pneumonitis.** |
| Age has no impact on acute and late toxicity of curative thoracic radiotherapy (Pignon et al. 1998) | 1208 patients in 6 age ranges from 50-70 years. | Data on acute and late toxicities. | Age has no impact on acute and late toxicity of curative thoracic radiotherapy. No correlation of age with acute nausea and weakness; **increased weight loss was associated with increased age**. |
| Radiation therapy alone in elderly with early stage non-small cell lung cancer (San Jose et al. 2006) | 33 patients RT, aged 71–97 years. | Data on radiotherapy and acute/ late high-grade toxicity. | Radiotherapy alone was effective and low toxic in elderly with early stage NSCLC. **No significant RT-related complications**; incidence of both acute and late high-grade toxicity was low and similar among all age groups. |

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