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course. The most frequent treatment sites (Table 1) were bone (40.1%) and brain metastasis (32.4%). The treatment intent was curative or palliative in 53% and 47% at the time of the first radiotherapy course, respectively. At the 5th course of RT, the indication was palliative in 86% of the cases. Five-year overall survival measured from the 1st RT course was 30.3% (Figure 1). When measured from the 5th RT course, median OS and 5-year overall survival were 1.2 years and 16.0%, respectively.

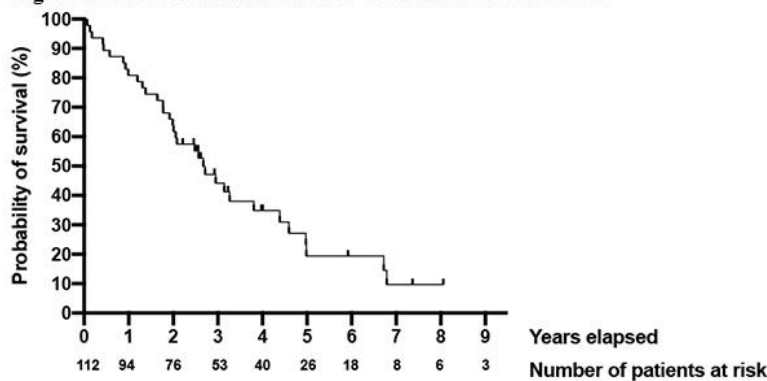
**Table 1:** Treatment characteristics

Parameter	Data (n=660 RT courses; n=112 pts)
Treatment intent	
➤ Curative, n (%)	147 (22.3)
➤ Palliative, n (%)	513 (77.7)
Treatment site	
➤ Bone metastasis, n (%)	265 (40.1)
➤ Brain metastasis, n (%)	214 (32.4)
➤ Lung metastasis, n (%)	71 (10.1)
➤ Primary, n (%)	36 (5.4)
➤ Lymph node metastasis, n (%)	29 (4.4)
➤ Liver metastasis, n (%)	16 (2.4)
➤ Soft tissue metastasis, n (%)	13 (2.0)
➤ Adrenal metastasis, n (%)	9 (1.4)
➤ Other, n (%) <sup>1</sup>	7 (1.1)

Abbreviations: Pts = patients; RT = radiation therapy.

<sup>1</sup>Includes mediastinal, renal, thyroid and pleural metastasis.

**Figure 1:** Overall survival from time of 1st RT treatment course



Abbreviations: RT = radiation therapy.

## Conclusion

Increasing numbers of patients are treated multiple courses of curative and palliative radiotherapy within the context of increased long-term cancer survivorship. In the future, increased research efforts are required to elucidate the safety and efficacy profile of multiple courses of irradiation in long-term cancer survivors.

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## PO-1528 Mood disorder in cancer patients undergoing radiotherapy during the COVID-19 outbreak

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## Purpose or Objective

Novel coronavirus (COVID-19) is having a devastating psychological impact on patients, especially patients with cancer. This work aims to evaluate mood disorders of cancer patients undergoing radiation therapy during COVID-19 in comparison with cancer patients who underwent radiation therapy in 2019.

## Materials and Methods

We included all the patients undergoing radiation therapy at our Department in two-time points (each a week for a month in May 2019) and during the COVID-19 outbreak (in April 2020).

All the patients were asked to fulfill a validated questionnaire (STAI-Y1, State trait anxiety inventory scale), the Symptom Distress thermometer (SDT) (from 0 to 10 score), and the Beck Depression Inventory v.2 (BDI-2). We took into account the COVID-19 outbreak and also sex, age, week of radiation treatment, and disease.

## Results

We included 458 patients (220 males and 238 females), with a median age of 64 years. STAI-Y1 median score was 40 (mean 41,3, range 19-79), whereas the median score of SDT was 5 and BDI-2 median score was 11.

STAI-Y1, SDT and BDI-2 were significantly correlated with COVID-19 outbreak ( $p < 0,001$  for all the tests), sex

(p: 0,016 for STAI-Y1, p<0,001 for SDT, p:0,013 for BDI-2), week of treatment (p: 0,012 for STAI-Y1 and p: 0,031 for SDT) and disease (p:0,015 for STAI-Y1, p<0,001 for SDT and p:0,020 for BDI-2).

#### Conclusion

The prevalence of mood disorders in patients undergoing radiation therapy is higher than expected and even higher during the COVID-19 outbreak. These measurements could be useful as a baseline to start medical humanities programs to decrease these scores.

#### PO-1529 HITRIplus project: building a pan-European heavy ion therapy research community

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#### Purpose or Objective

HITRIplus (Heavy Ion Therapy Research Integration plus) is an EU-funded project aiming to integrate and propel biophysics and medical research on cancer treatment with heavy ions beams while jointly developing the next generation of its instruments.

#### Materials and Methods

It is a consortium made by 22 Institutes from 14 European countries engaging all relevant stakeholders and for the first time bringing together the four European ion therapy centres with leading EU industries, academia and research laboratories.

#### Results

The HITRIplus project is structured in 3 pillars. The Transnational Access (TA) will integrate and open to external clinicians and researchers the European facilities providing therapeutic ion beams. Networking Activities (NA) will create networks among the institutions and will open the heavy ion facilities to the EU clinical and research community. Joint Research Activities (JRA) will develop new technologies to extend the reach of the present generation centres and to define a new European reference design to make ion therapy more accessible. The TA Clinical access will offer the opportunity to European hospitals and cancer institutes to refer their patients to the heavy ion facilities and to share prospective clinical studies and patient follow-up. The Clinical Networking activities will promote the heavy ion therapy facilities to medical researchers all over Europe by raising awareness about the tumour types that could be treated. Collaborative platforms and databases will be set up to share data and experience and to spread a common language among the clinical users of the ion facilities. TA Research accesses will allow to carry out research activities with the heavy ion beams available among the partners.

#### Conclusion

The HITRIplus will give the unique opportunity to European hospitals and oncological institutes to access and share the clinical expertise on heavy ion therapy by creating links among clinicians referring patients to the existing hadrontherapy facilities. It will also allow the radiation oncologists to work together with their colleagues in multicentre prospective comparative studies to improve the knowledge both in heavy ion therapy and in classical radiation oncology through clinical research practice and combining treatment modalities. The Research accesses will attract universities, research centres, and hospitals by using the beam time and research facilities of the existing heavy ion centres. Performing research at a clinical facility will allow researchers to meet different professionals and to have a clear perception of the possibility to translate the research from bench to bedside.



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#### PO-1530 Interobserver variability in GTV contouring in non-spine bone metastases

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#### Purpose or Objective

The optimal imaging test for GTV delineation in non-spine bone metastases has not been defined. Adequate delimitation is critical in SBRT. The hypothesis is that MRI allows for better visualization of the extend of bone metastases in non-spine bone metastases and will optimize the accuracy of tumor delineation for stereotactic radiotherapy purposes, compared with CT only. We evaluate the interobserver agreement in GTV of non-spine