All That Glitters is Not Gold: Examining Cost Effectiveness Analyses in Radiation Oncology

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Introduction

In resource constrained environments, economic analysis of health interventions are critical to inform policy and funding

Radiation oncology infrastructure and delivery costs are increasing, and indications for treatment are expanding

High quality economic analyses are integral to justifying new therapies

Objective

Perform a systematic review of economic analyses (Cost-effectiveness and cost-utility studies) in Radiation Oncology to:

1. Identify trends in publication, topics and radiation techniques (primary)
2. Conduct methodologic appraisal to inform best practices (secondary)

Materials & Methods

Search

Systematic review to PRISMA guidelines to identify studies

PubMed and Embase queried from inception to Sep 2020

- Keywords: “Radiation” + “Cost effectiveness/utility/analyses”

Screening

Independent authors conducted screening

Exclusion:

- Non-English
- Reviews/abstracts
- Studies only examining costs
- Radiopharmaceuticals

Synthesis

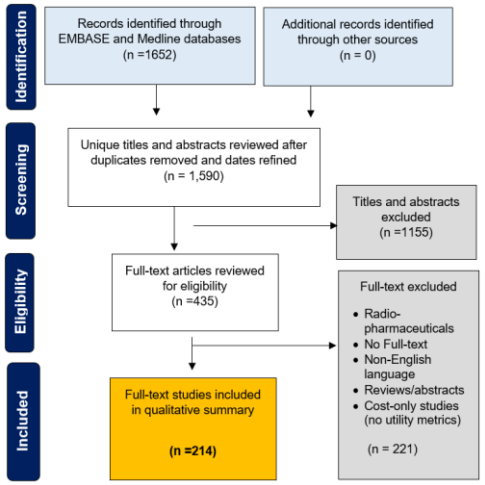
Abstracted data included:

- Study demographics (topic and intervention)
- Economic parameters
- Methodological details

Descriptive statistics and qualitative summary

Results

PRSIMA Figure



Study Demographics (n=214)

Fig 1. Publication Year

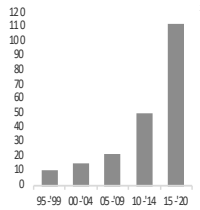


Fig 2. Journal

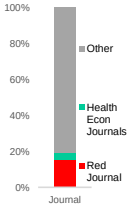


Fig 3. Study Characteristics

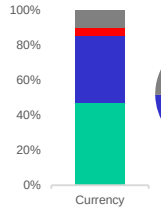
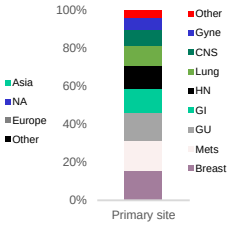


Fig 4. Study Location

Fig 5. Study Characteristics



Radiation Details

Fig 6. Radiation Type

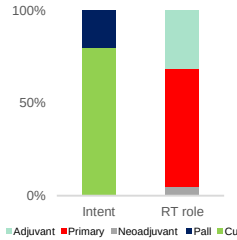
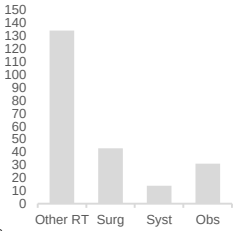


Fig 7. Radiation Comparator



Methodology

Fig 8. Outcomes and Sources

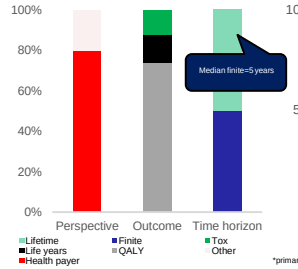


Fig 9. Utility Methods

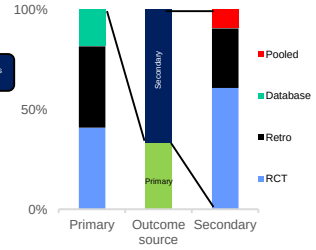
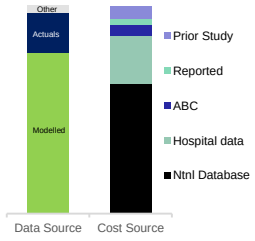


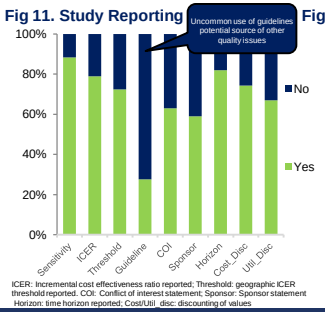
Fig 10. Costing Methods



*primary defined as derived directly by authors/institution; secondary as obtained from literature

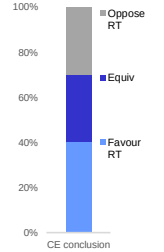
Appraisal

Fig 11. Study Reporting



ICER: Incremental cost effectiveness ratio reported; Threshold: geographic ICER threshold reported. COI: Conflict of interest statement; Sponsor: Sponsor statement Horizon: time horizon reported; Cost/Util_disc: discounting of values

Fig 12. Conclusions



*Novel RT intervention in cases when comparing RT types; RT alone when compared to Chemoradiaiton

Discussion

Increasing rate of publication; general oncology journals

Emerging topics include:

- Stereotactic radiation (n=45)
- Heavy particle therapy (n=11)
- Radiation and Immunotherapy (n=3)
- Oligometastases (n=4)

Methodologic issues

- Poor reporting of standard variables
- >50% papers with 1+ methodologic issue

Conclusion

Cost effectiveness analyses are increasingly common in radiation therapy

- Reporting and methodologic rigour must improve
- Greater use of published guidelines will improve data quality to generate meaningful insights for decision makers