

# INPLASY PROTOCOL

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**Review Stage at time of this submission:** Data analysis.

**Conflicts of interest:**  
None declared.

## The value of radiomics-based machine learning for hepatocellular carcinoma after TACE: a systematic evaluation and Meta-analysis

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**Review question / Objective:** Meta-analysis was performed to predict the efficacy and survival status of patients with hepatocellular carcinoma after the application of TACE, applying clinical models, radiomic models and combined models for non-invasive assessment. We performed a Meta-analysis on the prediction of efficacy and survival status after TACE for hepatocellular carcinoma.

**Condition being studied:** Patients were scanned using CT or MR machines, and some patients had multiple follow-up records, and imaging feature extraction software was applied to extract regions of interest and build multiple prediction models. Literature screening was conducted by two reviewers independently, who had more than 3 years' experience in imaging diagnosis and was cross-checked. Disagreements were settled by a third reviewer.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 June 2022 and was last updated on 25 June 2022 (registration number INPLASY202260100).

### INTRODUCTION

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## METHODS

**Participant or population:** Patients diagnosed using accepted gold standards.

**Intervention:** TACE.

**Comparator:** Gold standard.

**Study designs to be included:** Diagnostic test.

**Eligibility criteria:** Inclusion criteria: (1) English-language studies based on radiomic prediction models for the assessment of efficacy and survival status after TACE for hepatocellular carcinoma; (2) patients diagnosed using accepted gold standards; (3) outcome indicators with direct or indirect access to the predictive value of response models; (4) studies published in English. Exclusion criteria: (1) reviews, case studies, conference abstracts, thesis, and duplicate publications; (2) studies solely on radiomics methods without constructing risk models; (3) animal studies.

**Information sources:** PubMed, EMBase, the Cochrane Library, Web of Science.

**Main outcome(s):** This Meta-analysis investigated the application of a radiomics-based predictive model to assess the efficacy of TACE after hepatocellular carcinoma, which has a more desirable predictive value and is more effective when radiomics is combined with a clinical index model.

**Quality assessment / Risk of bias analysis:** Assessment of literature quality using the Radiomics Quality Score (RQS) radiological quality assessment scale.

**Strategy of data synthesis:** Meta-analysis was performed by applying Stata15.0 (StataCorp LLC, College Station, TX), and because of the application of the risk model to treatment response and prognostic survival status, we used the outcome index of c-index, which was expressed as c-index and its 95% confidence interval when combining effect sizes. The inconsistency index (allometric,  $I^2$ ) was used to reflect the heterogeneity among individual risk models, and a random-effects model was used when  $I^2 > 50\%$ , while a fixed-effects model was chosen to calculate the combined-effects indicators when  $I^2 \leq 50\%$ . Also, we considered risk models constructed with radiomics and radiomics combined with clinical indicators for subgroup analysis.

**Subgroup analysis:** Each group was divided into two groups according to treatment efficacy and survival status, and heterogeneity was analyzed for clinical model, radiomics model, and clinical combined with radiomics model, respectively.

**Sensitivity analysis:** Application of Stata 15.0 for sensitivity analysis performed by applying Stata15.0.

**Country(ies) involved:** China.

**Keywords:** Hepatocellular carcinoma; TACE, radiomics, efficacy, survival, Meta-analysis.

### Contributions of each author:

Author 1 - Yingxuan Wang - contributed to the study design and the original protocol, collected and analyzed the data, interpreted the data, wrote the manuscript.

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Author 2 - Cheng Yan - collected and analyzed the data, interpreted the data. YW wrote the manuscript, revised the manuscript.

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Author 3 - Liqin Zhao - contributed to the study design and the original protocol, interpreted the data. YW wrote the manuscript, revised the manuscript.

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