

## ORIGINAL ARTICLE

# Assessment of the reporting of quality and outcome measures in hepatic resections: a call for 90-day reporting in all hepatectomy series

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## Abstract

**Background:** The aim of this paper is to assess the current state of quality and outcomes measures being reported for hepatic resections in the recent literature.

**Methods:** Medline and PubMed databases were searched for English language articles published between 1 January 2002 and 30 April 2013. Two examiners reviewed each article and relevant citations for appropriateness of inclusion, which excluded papers of liver donor hepatic resections, repeat hepatectomies or meta-analyses. Data were extracted and summarized by two examiners for analysis.

**Results:** Fifty-five studies were identified with suitable reporting to assess peri-operative mortality in hepatic resections. In only 35% (19/55) of the studies was the follow-up time explicitly stated, and in 47% (26/55) of studies peri-operative mortality was limited to in-hospital or 30 days. The time period in which complications were captured was not explicitly stated in 19 out of 28 studies. The remaining studies only captured complications within 30 days of the index operation (8/28). There was a paucity of quality literature addressing truly patient-centred outcomes.

**Conclusion:** Quality outcomes after a hepatic resection are inconsistently reported in the literature. Quality outcome studies for a hepatectomy should report mortality and morbidity at a minimum of 90 days after surgery.

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## Introduction

A hepatic resection has evolved into a common surgical procedure for a wide range of benign and malignant indications. The number of hepatic resections performed in the United States has been increasing over time.<sup>1</sup> Decreasing mortality rates for major hepatic resections have been reported over time.<sup>1,2</sup> Despite the complexity of resections and the comorbidities of patients increasing, reported morbidity rates have remained relatively stable over time.<sup>2-4</sup> While experience with complex hepatic resections has grown with favourable outcomes, more data are needed to risk stratify patients and

identify those at a high and low risk of post-operative complications in order to provide accurate and informed pre-operative counselling.

Patient-centred outcomes that look beyond short-term mortality and disease-free survival should be part of quality outcomes in a hepatic resection. Quality outcomes after a hepatic resection are inconsistently defined and variably reported in the literature. Benchmarks are being made based on outcomes data from a wide variety of sources, ranging from single institution centres to national administrative databases. The aim of this research was to review the most current decade of published outcomes after a hepatic resection, to identify and define robust quality and outcome parameters, and to propose a set of criteria for liver resection outcomes research in the future.

This study was presented at the Annual Meeting of the AHPBA, 19-23 February 2014, Miami, Florida.

## Method

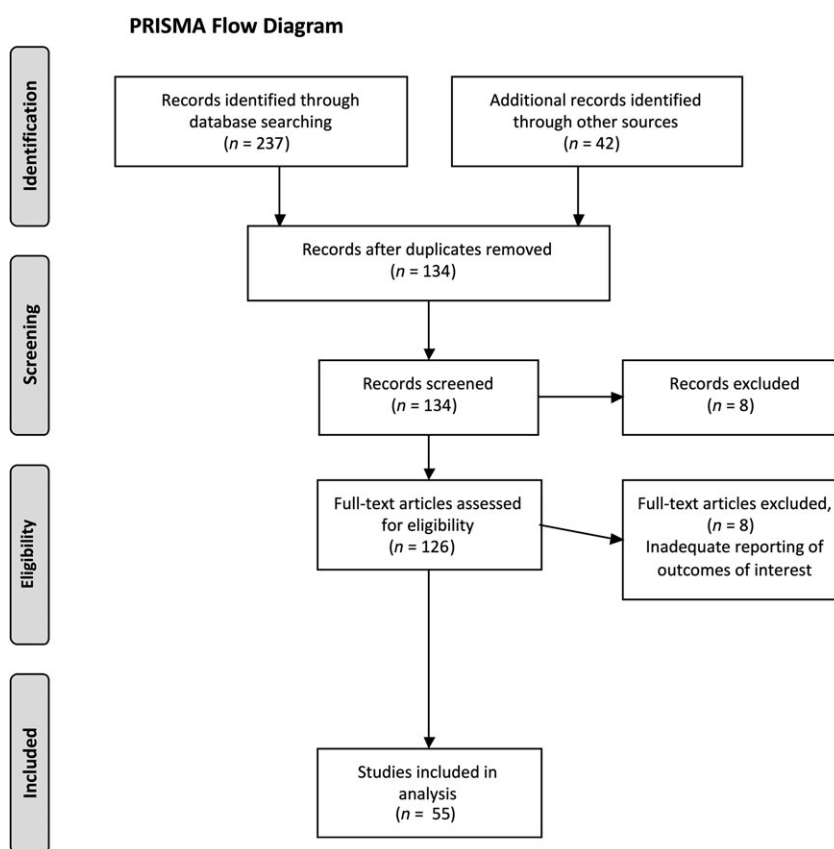
This systematic review was conducted in accordance with the PRISMA guidelines.<sup>5</sup> An electronic search of Medline and PubMed databases was performed using combinations of the keywords ‘quality outcomes,’ ‘hepatectomy,’ ‘liver resection’ and ‘hepatic resection.’ The search was limited to studies published between 1 January 2002 and 30 April 2013. Inclusion criteria included studies focusing on resection for neoplastic disease with curative intent, although studies that integrated non-neoplastic or trauma indications along with malignant indications were reviewed. Exclusion criteria included non-English language publications, meta-analyses and series limited to living donor hepatectomies and repeat hepatectomies.

Two examiners reviewed all abstracts of studies identified for potential inclusion. Additional potential studies for inclusion were identified from the references of studies identified in the database search. Reviewers then compiled study characteristics and outcomes of interest, including study type (single centre, multi-institutional or administrative database), disease type, reported follow-up, extent of hepatic resection (major hepatectomy defined as  $\geq 3$  segments) and the time period of data collection. Outcomes of interest included mortality,

morbidity, major morbidity and post-operative liver failure; the various definitions of these outcomes were also recorded. Complications were considered defined if the explicit type of complications were reported and were considered graded if they were defined and ranked on an ordinal scale. Studies were then compared along the lines of reported mortality and morbidity outcomes.

## Results

The results of the review process are reported in the Fig. 1. Reviewers identified 55 studies with suitable reporting to assess peri-operative mortality, and 28 studies with adequate reporting of peri-operative morbidity. The 55 studies reporting peri-operative mortality were heterogeneous in study population, design and outcome reporting. A meta-analysis of these reports with any meaningful statistical validity was not possible owing to heterogeneity. Study design and mortality measures are summarized in Table 1. Ranges of reported mortality rates were as follows: 0–11.9% (30 day), 3.4–9.1% (60 day, and 0.9–10.8% (90 day). Study characteristics of the 28 studies reporting peri-operative morbidity after hepatic resection are



**Figure 1** Flow diagram illustrating the selection of studies in the review process

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