

# Optimal Liver Exchange with Equipoise

Alex Chan\*

Stanford University

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## Abstract

The practical and ethical needs of liver exchange is different from kidney exchange, a new mechanism is proposed. Instead of just maximizing the number of exchanges, clinicians prioritize liver transplant candidates with the highest medical urgency as measured by MELD score first. Donation of the right liver lobe is five-fold riskier than the left lobe for the donor. An exchange that involves donors giving different lobes is deemed unfair. Existing mechanisms are not suited to identify optimal matchings for the organ exchange problem that needs to flexibly meet a finite exchange cycle-length constraint, accommodate indifferences in preferences, maximize transplants for highest priority patients and keep risk balanced for donors. The proposed mechanism yields optimal allocations, respects balanced donor risk, maximizes priority and is incentive compatible.

**Keywords:** Market Design; Liver Exchange; Matching; and Health Economics

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\*Email: [chanalex@stanford.edu](mailto:chanalex@stanford.edu)