

## Acetaminophen Poisoning and King's College Criteria: Identifying the Need for a Transfer Guideline

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### Introduction

Patients with acetaminophen poisoning and hepatic dysfunction may require inter-hospital transfer to liver transplant centers (LTCs). The cost of transfer has been estimated at more than \$5,000 per patient. Guidelines exist to aid in the decision to transplant livers, however, utilizing these guidelines for transfer decisions may leave patients too sick to benefit from transfer.

### Research Question

What are the characteristics of patients transferred to LTCs for acetaminophen poisoning as it relates to the development of King's College Criteria (KCC)?

### Methods

Regional Poison Center (RPC) acetaminophen cases coded for treatment with N-acetyl cysteine (NAC) from January 1, 2012 through December 31, 2015 were retrospectively reviewed. Data abstracted included outcomes, inter-hospital transfers, and laboratory results for KCC (INR>6.5, pH<7.30, Creatinine>3.4 mg/dL).

### Results

Over the 4-year study period, 285(7.1%) of 3,989 patients were transferred to LTCs. Transfers to pediatric LTCs represented 37.5% of all transfers, and all survived without transplantation. Of the 178 patients transferred to adult LTCs, 130(73.0%) never met KCC. Forty patients met KCC prior to transfer. After exclusion of 5 cases for incomplete outcome data, 12(34.3%) of these patients died and 3(8.6%) underwent successful liver transplantation. The deaths did not receive transplantation for reasons including death while awaiting transplant (4), brain injury/death (3), and comorbidities prohibiting transplantation (3). Eight patients met KCC after transfer to a LTC and 2(25%) died; one too unstable for transplant and another while awaiting transplantation. A subset of 51 patients met KCC but were not transferred to LTCs with 18(35%) dying. Of deaths, documented reasons for no-transfer included hemodynamic instability(11), and brain injury/death(5).

### Discussion

Hospital transfers to LTCs in acetaminophen poisoning comprised 7.1% of all cases treated with NAC. The majority of patients transferred survived with only NAC, while patients who already met KCC at non-LTCs had a high rate of death even after transfer to LTCs. These patients may have benefitted from earlier transfer.

### Conclusion

Further research is needed to develop clinical guidelines to identify patients who would benefit from transfer to LTCs prior to meeting KCC, while avoiding the expensive transfer of patients who would not.