

# Long-term Risk of dementia after recovery from Acute Kidney Injury--- A population-based study

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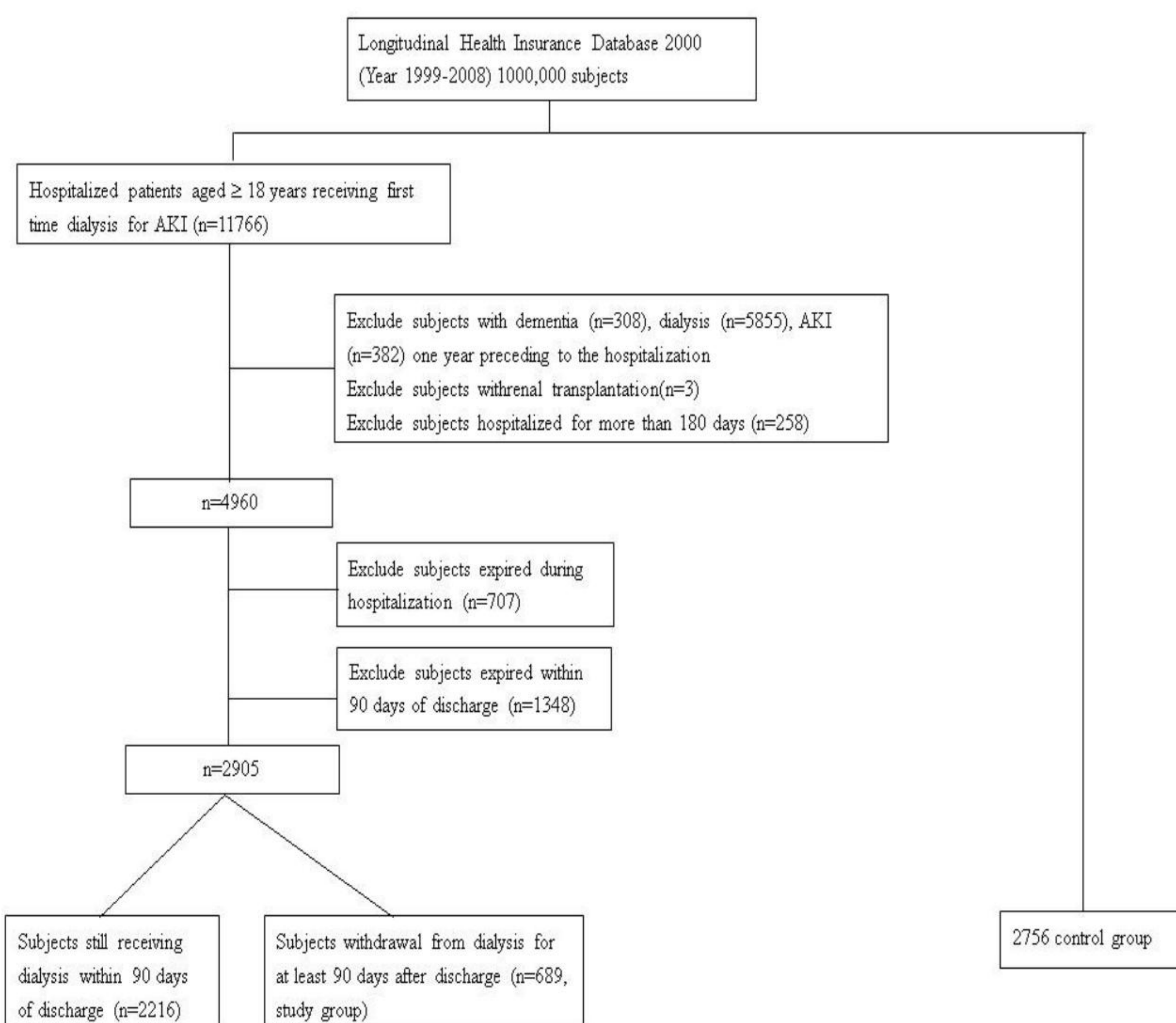
## Introduction

The worldwide number of people affected by cognitive decline including cognitive impairment and dementia is increasing. The adverse neurological effects are thought to be more common and more severe after AKI. Our objective is to investigate the long term risk of dementia after recovery from dialysis requiring acute kidney injury (AKI).

## Methods

The study was based on the data of all hospitalized patients collected from the National Health Insurance Research Database of Taiwan. Patients withdrawal from dialysis requiring AKI after discharge for at least 90 days were selected and patients without AKI were selected as control group. The Cox proportional hazard regression model adjusted with ongoing end-stage renal disease or chronic kidney disease after discharge was applied to determine the risk of dementia.

Figure 1. Flow diagram of the case selection process



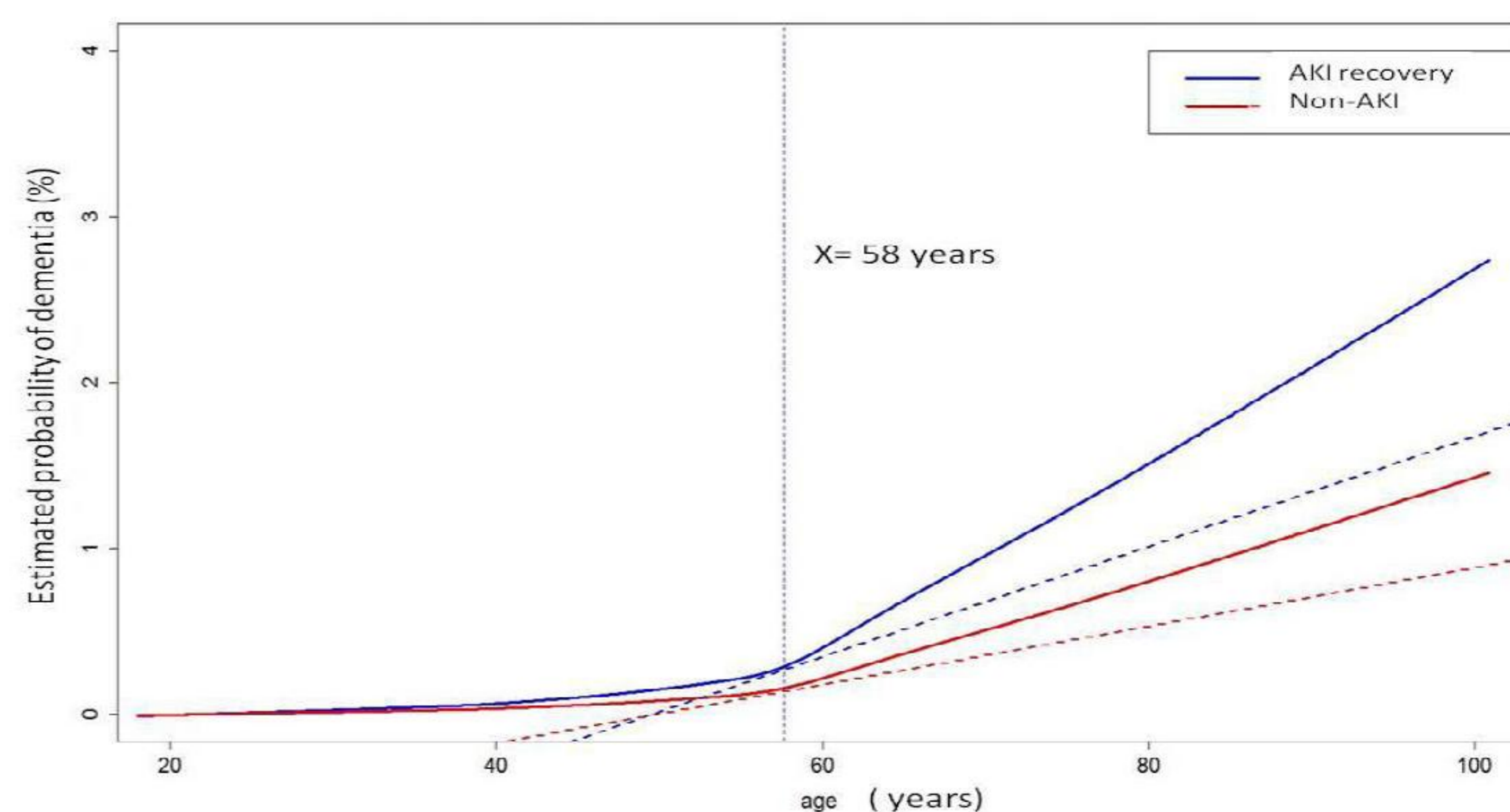
## Results

Of 2905 AKI-dialysis patients, 689 (23.7%) could withdraw from acute dialysis for at least 90 days. The incidence rate of dementia was 200 per 10,000 person-years in the recovery group. Cox proportional hazard regression model showed recovery group had greater risk (hazard ratio [HR], 2.01, p=0.01) than non-AKI patients to develop long-term dementia. The conditional effect plot showed the estimated dementia amplified after age 58 years in temporary dialysis patients. In addition, developing dementia after discharge was associated with increased all-cause mortality (HR, 2.38; p < 0.001).

Table 1 Independent predictive factors for long-term dementia by time varying- Cox regression model

Covariate	OR (95% CI)	P value
Age (per year)	1.10 (1.08-1.11)	<0.001
Acute dialysis	2.01 (1.19-3.39)	0.01
Stroke	1.80 (1.00-3.25)	0.05
Neurologic comorbidities	4.82 (1.15-20.14)	0.03
Ongoing ESRD after discharge	0.96 (0.37-2.49)	0.93

Figure 2. Conditional effect plot of estimated risk against patient's age according to withdrawal from acute dialysis and non-AKI patients



## Conclusion

This study shows that patients recovery from dialysis requiring AKI are associated with a greater risk to develop dementia than non-AKI patients. These results raise concerns that the strategy to prevent the neurological complications of AKI, even recovery from dialysis requiring AKI.

## References

1. Henrich WL. Hemodynamic instability during hemodialysis. *Kidney Int* 1986; 30: 605-612.
2. Wu VC, et al. Sustained low-efficiency dialysis versus continuous veno-venous hemofiltration for postsurgical acute renal failure. *Am J Surg* 2009; 199: 466-476.

