**AWARD RECIPIENT**

## Steven G. Coca, DO

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**PROJECT**

"Effect of Acute Kidney Injury on Long-Term Kidney Function in Elderly Patients"

**MENTORSHIP TEAM**

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Chronic kidney disease (CKD) is an important public health problem, as CKD is an established risk factor for cardiovascular disease, functional decline, and death. Nearly 50% of people 70 years and older have CKD, and the prevalence has increased to a greater degree over the past several years. In addition, the incidence rate of acute kidney injury (AKI) is highest in the elderly population, and similar to CKD, has an elevated prevalence rate over the past several years. The high incidence of AKI in elderly persons can be mainly attributed to: age-related co-morbidities facilitating AKI (e.g., renovascular disease, congestive heart failure); procedures, drugs, or surgery that function as renal stressors; and age-dependent structural and functional alterations in the kidney. The result is diminished renal reserve in the setting of pathophysiologic challenges, lending the elderly very vulnerable to AKI.

Given the risk for AKI in the elderly, the clinical outcomes after AKI in this group are of great importance. Unfortunately, there is a dearth of data on long-term outcomes after AKI in the elderly population. While AKI is widely viewed as transient and reversible, there is emerging evidence that AKI may contribute to progression of CKD. Indeed, the increasing prevalence of CKD in elderly patients may be due partially to the concurrent and marked rise in the incidence of AKI in this group over time.

The relationship between AKI and CKD in elderly persons must be investigated further. This line of research may be facilitated via biomarkers of kidney injury, such as interleukin-18 and neutrophil gelatinase-associated lipocalin. These biomarkers are thought to be elevated only after true renal tubular injury. Thus, as opposed to functional biomarkers such as serum creatinine, these structural biomarkers of acute injury and other biomarkers of kidney fibrosis (transforming growth factor beta-1, connective tissue growth factor) may be more aptly suited to predict which patients will suffer from progressive renal disease.

We will perform long-term follow-up on an established cohort of 1,500 cardiac surgery patients enrolled in a short-term prospective cohort study. The goals of this study are the following:

1. To determine the factors associated with accelerated long-term decline in kidney function in elderly patients.

2. To determine if AKI-specific biomarkers can predict long-term outcomes (i.e., CKD, end-stage renal disease, death) in an elderly population.

3. To ascertain if AKI is associated with increased concentrations of urinary markers of renal fibrosis, and whether these markers predict long-term decline in kidney function.

4. To determine the association between AKI and health-related quality of life.

The support of the American Society of Nephrology-ASP Junior Development Award in Geriatric Nephrology will allow me ongoing mentorship and training in geriatrics and nephrology, thus providing a solid foundation for my growth and development towards my goals of becoming a successful epidemiologist and physician-scientist. In addition to completing my master's degree in epidemiology and public health, this award will allow me to use the knowledge gained from working on this project to help develop a future National Institutes of Health RO1 application.