



THE GRADUATE COLLEGE OF THE
UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER
ANNOUNCES THE FINAL EXAMINATION OF

Ann Norris

FOR THE DEFENSE OF THE
DOCTOR OF PHILOSOPHY DEGREE
GRADUATE COLLEGE
DEPARTMENT OF BIostatISTICS AND EPIDEMIOLOGY

July 26TH, 2016 at 2:00pm
College of Public Health Building, Room 204

AN EVALUATION OF MEDICAL AND BEHAVIORAL RISK FACTORS FOR AVIATION ACCIDENTS

COMMITTEE IN CHARGE: Jennifer D. Peck, Ph.D. (chair), Tabitha Garwe, Ph.D., Julie A. Stoner, Ph.D., Laura A. Beebe, Ph.D., Valerie J. Skaggs, Ph.D.

ABSTRACT: *Introduction:* Medical and behavioral exposures such as diabetes and alcohol- and drug-related behaviors are relatively common among United States civilian pilots. However, the underlying biological and psychological mechanisms by which these exposures may serve as risk factors for aviation safety are poorly understood and additional epidemiologic research is warranted. By using data from the entire population of medically-certificated airmen flying general aviation operations, we were able to evaluate the extent to which both diabetes and prior drug or alcohol behavior are associated with fatal and non-fatal general aviation accidents.

Methods: We utilized pilot medical certification data from the Office of Aerospace Medicine (OAM): 1) to conduct a matched case-control study of associations between diabetes, diabetes-related morbidities, and drug- and alcohol-related convictions or abuse with aviation accidents among third-class pilots medically certificated from 2009-2013, and 2) to conduct a retrospective cohort study of drug and alcohol-related fatalities among 1,026 pilots involved in fatal aviation accidents from 2009-2014.

Results: We observed the odds of having an accident were higher in both pilots with diabetes controlled by insulin and pilots with a previous history of alcohol or drug problems compared with those without the exposures. Furthermore, among pilots who died in an aviation accident, the risk of having alcohol or drugs in the pilot's system at the time of the crash was three times higher in pilots with previous drug and alcohol problems compared with those who had no prior history of convictions or abuse. The magnitude of the association with aviation accidents was attenuated with increasing time since the most recent offense or substance abuse diagnosis.

Discussion: Our research builds consensus within the existing literature regarding past drug and alcohol behaviors as a risk factor for future aviation accidents. However, because we were the first to assess associations between insulin-dependent diabetes and related comorbidities and aviation accidents, additional research is needed to verify our results. This study provides evidence that pilots with insulin-controlled diabetes or at least one prior alcohol- or drug-related offense or substance abuse diagnosis, particularly those who recently obtained these exposures, should continue to be closely monitored by OAM.