

## ARIC Manuscript Proposal #2932

PC Reviewed: 02/13/17  
SC Reviewed: \_\_\_\_\_

Status: \_\_\_\_\_  
Status: \_\_\_\_\_

Priority: 2  
Priority: \_\_\_\_\_

**1.a. Full Title:** Television Watching and Incident Atrial Fibrillation: the Atherosclerotic Risk in Communities Study

**b. Abbreviated Title (Length 26 characters):** Watching TV and AF

### 2. Writing Group:

Writing group members: Yasuhiko Kubota, Alvaro Alonso, Amil Shah, Lin Chen, Aaron Folsom

I, the first author, confirm that all the coauthors have given their approval for this manuscript proposal. YK [please confirm with your initials electronically or in writing]

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**ARIC author** to be contacted if there are questions about the manuscript and the first author does not respond or cannot be located (this must be an ARIC investigator).

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### 3. Timeline:

Data analysis: 1-2 months from manuscript approval date.

First draft of the manuscript: 2-3 months from manuscript approval date.

### 4. Rationale:

Sedentary behavior has been suggested to be associated with increased risk of incident cardiovascular disease (CVD), and all-cause as well as CVD mortality, independent of physical activity (1–4). A recent report suggested that high levels of physical activity did not prevent the increased risk associated with high TV-watching time (5). Thus, of

several sedentary behaviors, TV watching might be a risk factor or marker for CVD physical activity.

Atrial fibrillation (AF) is the most frequent sustained cardiac arrhythmia encountered in Western countries, and millions of individuals are expected to suffer from it in the next decades (6). Thus, it is important to identify risk factors for AF. Many modifiable risk factors associated with atherosclerotic CVD have also been associated with AF (7). Although physical inactivity seems more weakly associated with AF risk compared with atherosclerotic CVD risk (7), TV watching still may be independently associated with the risk of AF. However, to date, no study has investigated the association between TV watching and AF risk.

Therefore, we sought to test the hypothesis that the frequency of TV watching is positively associated with incident AF risk independent of other AF risk factors.

## **5. Main Study Questions:**

Greater frequency of TV watching is associated with increased incident AF risk independent of other AF risk factors.

## **6. Design and analysis (study design, inclusion/exclusion, outcome and other variables of interest with specific reference to the time of their collection, summary of data analysis, and any anticipated methodologic limitations or challenges if present).**

### Design

Prospective cohort

### Inclusion/exclusion criteria

Inclusion: Participants who provided information on TV-watching in the Baecke questionnaire at visit 1.

Exclusion: Those who had prevalent AF at visit 1.

### Main exposure

TV-watching (never, seldom, sometimes, often, very often) at visit 1.

### Covariates

Age, sex, race/ARIC field center, height, estimated GFR, smoking status, pack-years of smoking, alcohol drinking, left ventricular hypertrophy by ECG, and physical activity (MET-hours/week or AHA recommendation levels).

In this study, we consider body mass index, systolic and diastolic blood pressure, anti-hypertension medication, diabetes mellitus, prevalent heart failure and coronary heart disease at visit 1, and time-varying coronary heart disease and heart failure as potential mediators.

### Endpoints

Incident AF from visit 1 through 2013.

### Statistical analysis

Firstly, covariates will be presented according to frequency of TV-watching.

Secondly, hazard ratios and their 95% confidence intervals for incident AF will be calculated using Cox proportional hazard models in relation to frequency of TV-watching.

- Model 1: adjustment for age, sex, race, and ARIC study site.
- Model 2 (main model): Model 1 + adjustment for height, estimated GFR, smoking status, alcohol drinking, left ventricular hypertrophy by ECG, and physical activity.
- Model 3 (mediator analysis): Model 2 + adjustment for potential mediators.

We will also check whether higher physical activity (higher MET-hours/week or physical activity recommended level) can eliminate increased risk of AF by TV watching in a similar way to a previous study (5). In addition, we will test interactions between physical activity and TV watching and between body mass index and TV watching (6).

### Limitation

ARIC measured frequency of TV watching qualitatively, but not actual time spent during TV watching.

**7.a. Will the data be used for non-CVD analysis in this manuscript?**

Yes  No

**b. If Yes, is the author aware that the file ICTDER03 must be used to exclude persons with a value RES\_OTH = "CVD Research" for non-DNA analysis, and for DNA analysis RES\_DNA = "CVD Research" would be used?**  Yes  No

(This file ICTDER has been distributed to ARIC PIs, and contains the responses to consent updates related to stored sample use for research.)

**8.a. Will the DNA data be used in this manuscript?**

Yes  No

**8.b. If yes, is the author aware that either DNA data distributed by the Coordinating Center must be used, or the file ICTDER03 must be used to exclude those with value RES\_DNA = "No use/storage DNA"?**

Yes  No

**9. The lead author of this manuscript proposal has reviewed the list of existing ARIC Study manuscript proposals and has found no overlap between this proposal and previously approved manuscript proposals either published or still**

**in active status.** ARIC Investigators have access to the publications lists under the Study Members Area of the web site at: <http://www.csc.unc.edu/ARIC/search.php>

Yes  No

**10. What are the most related manuscript proposals in ARIC (authors are encouraged to contact lead authors of these proposals for comments on the new proposal or collaboration)?**

**Multiple ARIC papers on individual outcomes. For example:**

#616: Associations of television watching with physical activity, diet, and weight status

#2601: Changes in Leisure-Time Physical Activity and Risk of Incident Atrial Fibrillation – The Atherosclerosis Risk in Communities (ARIC) Study

**11.a. Is this manuscript proposal associated with any ARIC ancillary studies or use any ancillary study data?**  Yes  No

**11.b. If yes, is the proposal**

**A. primarily the result of an ancillary study (list number\* 2009.16)**

**B. primarily based on ARIC data with ancillary data playing a minor role (usually control variables; list number(s)\* \_\_\_\_\_ )**

\*ancillary studies are listed by number at <http://www.csc.unc.edu/aric/forms/>

**12a. Manuscript preparation is expected to be completed in one to three years. If a manuscript is not submitted for ARIC review at the end of the 3-years from the date of the approval, the manuscript proposal will expire.**

**12b. The NIH instituted a Public Access Policy in April, 2008** which ensures that the public has access to the published results of NIH funded research. It is **your responsibility to upload manuscripts to PUBMED Central** whenever the journal does not and be in compliance with this policy. Four files about the public access policy from <http://publicaccess.nih.gov/> are posted in <http://www.csc.unc.edu/aric/index.php>, under Publications, Policies & Forms. [http://publicaccess.nih.gov/submit\\_process\\_journals.htm](http://publicaccess.nih.gov/submit_process_journals.htm) shows you which journals automatically upload articles to Pubmed central.

**13. Per Data Use Agreement Addendum for the Use of Linked ARIC CMS Data, approved manuscripts using linked ARIC CMS data shall be submitted by the Coordinating Center to CMS for informational purposes prior to publication.**

Approved manuscripts should be sent to Pingping Wu at CC, at [pingping\\_wu@unc.edu](mailto:pingping_wu@unc.edu). I will be using CMS data in my manuscript  Yes  No.

## References:

1. Wilmoth EG1, Edwardson CL, Achana FA, Davies MJ, Gorely T, Gray LJ, Khunti K, Yates T, Biddle SJ. Sedentary time in adults and the association with diabetes, cardiovascular disease and death: systematic review and meta-analysis. *Diabetologia*. 2012 Nov;55(11):2895-905. doi: 10.1007/s00125-012-2677-z. Epub 2012 Aug 14.
2. Biswas A, Oh PI, Faulkner GE, Bajaj RR, Silver MA, Mitchell MS, Alter DA. Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: a systematic review and meta-analysis. *Ann Intern Med*. 2015 Jan 20;162(2):123-32. doi: 10.7326/M14-1651.
3. Chomistek AK, Manson JE, Stefanick ML, Lu B, Sands-Lincoln M, Going SB, Garcia L, Allison MA, Sims ST, LaMonte MJ, Johnson KC, Eaton CB. Relationship of sedentary behavior and physical activity to incident cardiovascular disease: results from the Women's Health Initiative. *J Am Coll Cardiol*. 2013 Jun 11;61(23):2346-54. doi: 10.1016/j.jacc.2013.03.031. Epub 2013 Apr 10.
4. Young DR, Reynolds K, Sidell M, Brar S, Ghai NR, Sternfeld B, Jacobsen SJ, Slezak JM, Caan B, Quinn VP. Effects of physical activity and sedentary time on the risk of heart failure. *Circ Heart Fail*. 2014 Jan;7(1):21-7. doi: 10.1161/CIRCHEARTFAILURE.113.000529.
5. Ekelund U, Steene-Johannessen J, Brown WJ, Fagerland MW, Owen N, Powell KE, Bauman A, Lee IM; Lancet Physical Activity Series 2 Executive Committee; Lancet Sedentary Behaviour Working Group. Does physical activity attenuate, or even eliminate, the detrimental association of sitting time with mortality? A harmonised meta-analysis of data from more than 1 million men and women. *Lancet*. 2016 Sep 24;388(10051):1302-10. doi: 10.1016/S0140-6736(16)30370-1. Epub 2016 Jul 28.
6. Violi F, Soliman EZ, Pignatelli P, Pastori D. Atrial Fibrillation and Myocardial Infarction: A Systematic Review and Appraisal of Pathophysiologic Mechanisms. *J Am Heart Assoc*. 2016 May 20;5(5).
7. Miller JD, Aronis KN, Chrispin J, Patil KD, Marine JE, Martin SS, Blaha M1, Blumenthal RS, Calkins H. Obesity, Exercise, Obstructive Sleep Apnea, and Modifiable Atherosclerotic Cardiovascular Disease Risk Factors in Atrial Fibrillation. *J Am Coll Cardiol*. 2015 Dec 29;66(25):2899-906. doi: 10.1016/j.jacc.2015.10.047.
8. Huxley RR, Misialek JR, Agarwal SK, Loehr LR, Soliman EZ, Chen LY, Alonso A. Physical activity, obesity, weight change, and risk of atrial fibrillation: the Atherosclerosis Risk in Communities study. *Circ Arrhythm Electrophysiol*. 2014 Aug;7(4):620-5. doi: 10.1161/CIRCEP.113.001244.