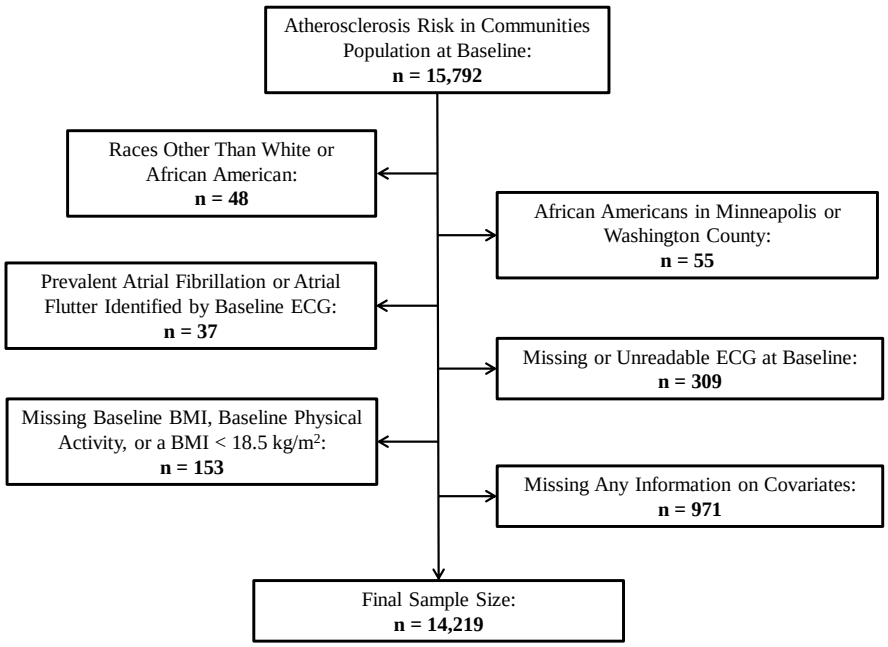
SUPPLEMENTAL MATERIAL

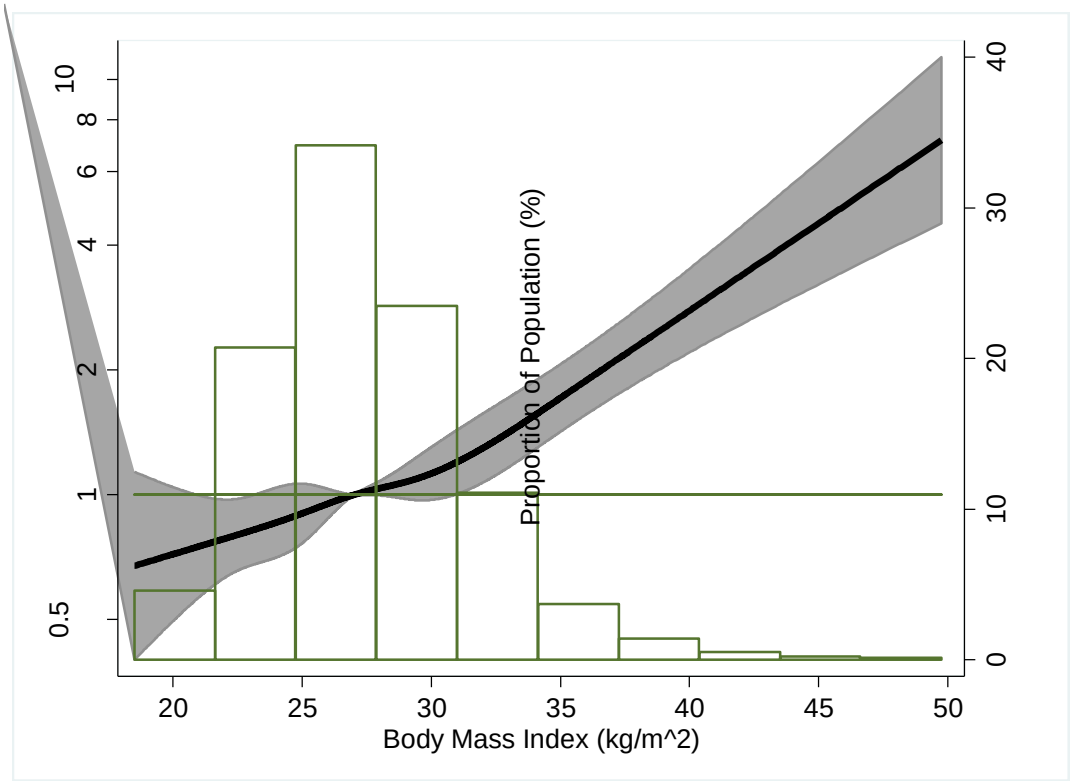
Supplemental Figure 1. Flow chart of participants excluded at baseline, Atherosclerosis Risk in Communities Study (ARIC), 1987-1989.



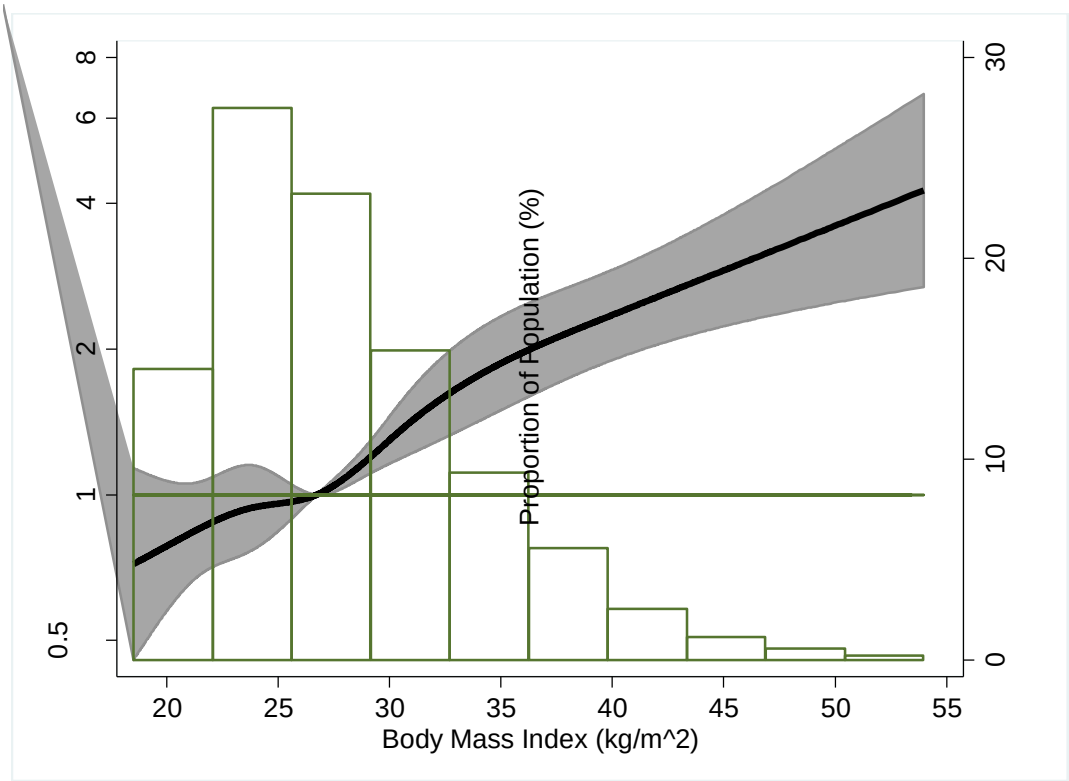
Total Initial Sample Size (After exclusions): 14,219

Total AF Cases: 1,775

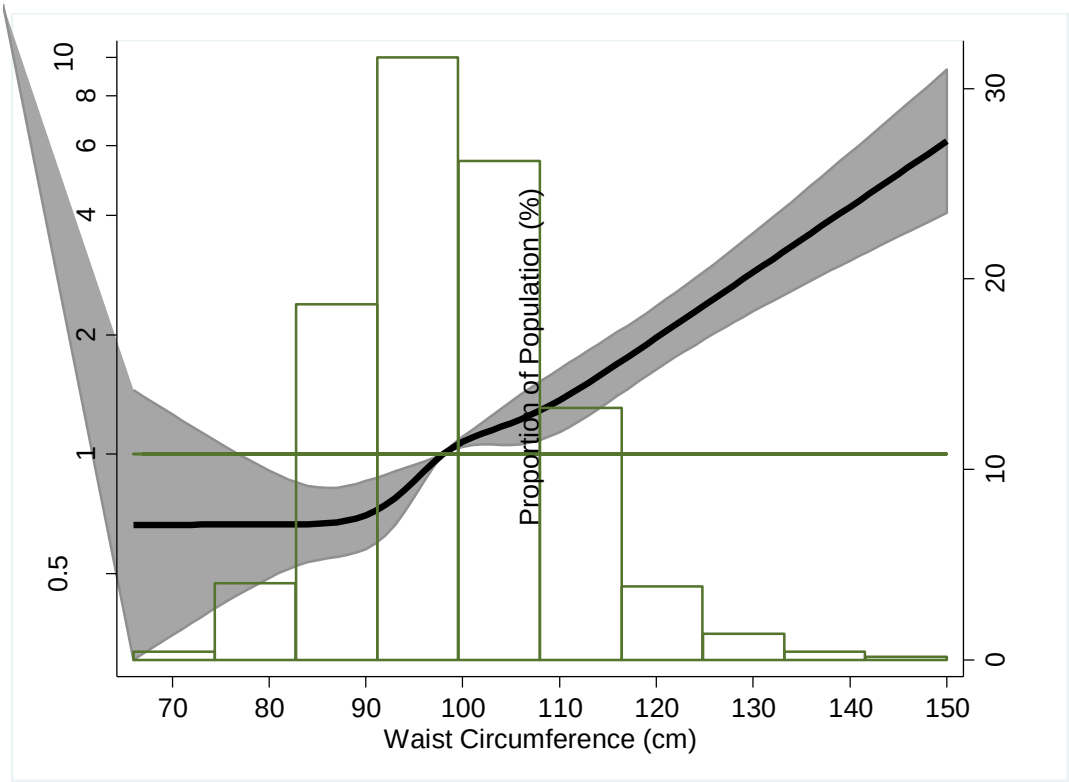
Supplemental Figure 2. Association of body mass index with incidence of atrial fibrillation in men presented as hazard ratio (solid line) and 95% confidence intervals (shaded area). Results from Cox proportional hazards model using restricted cubic splines, adjusted for age and race. Median value of body mass index was considered the reference (HR=1). The histograms represent the frequency distribution of the body mass index in the study sample.



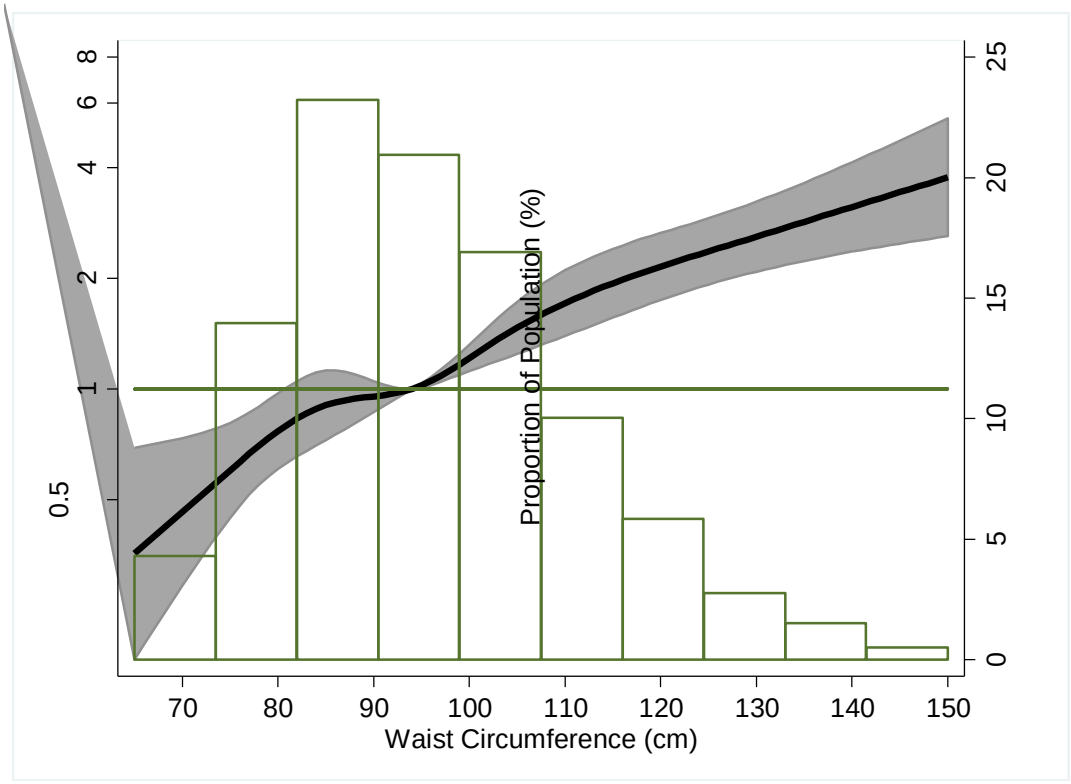
Supplemental Figure 3. Association of body mass index with incidence of atrial fibrillation in women presented as hazard ratio (solid line) and 95% confidence intervals (shaded area). Results from Cox proportional hazards model using restricted cubic splines, adjusted for age and race. Median value of body mass index was considered the reference (HR=1). The histograms represent the frequency distribution of the body mass index in the study sample.



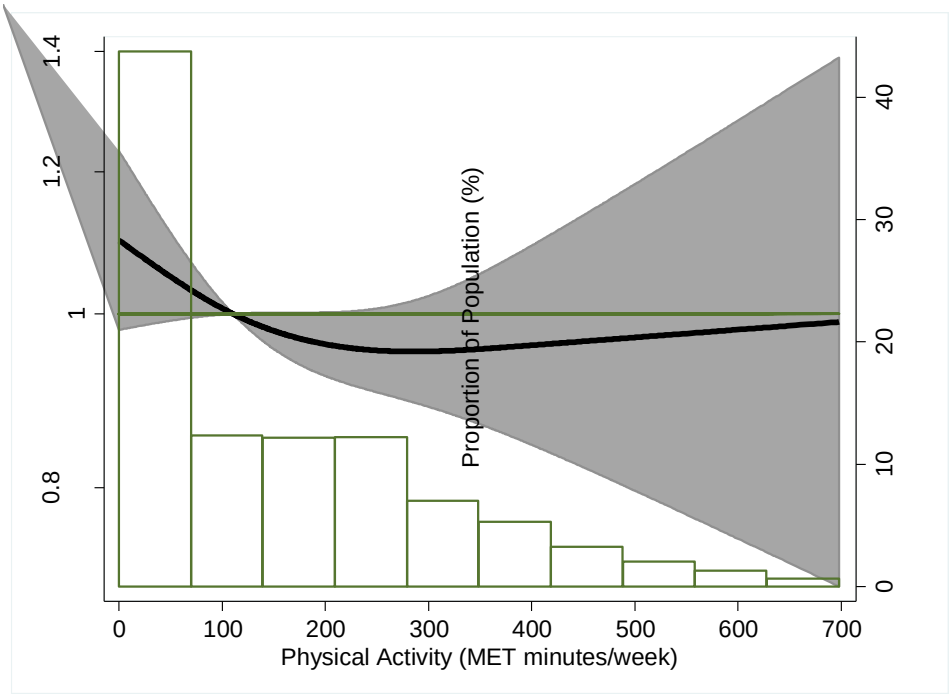
Supplemental Figure 4. Association of waist circumference with incidence of atrial fibrillation in men presented as hazard ratio (solid line) and 95% confidence intervals (shaded area). Results from Cox proportional hazards model using restricted cubic splines, adjusted for age and race. Median value of waist circumference was considered the reference (HR=1). The histograms represent the frequency distribution of the waist circumference in the study sample.



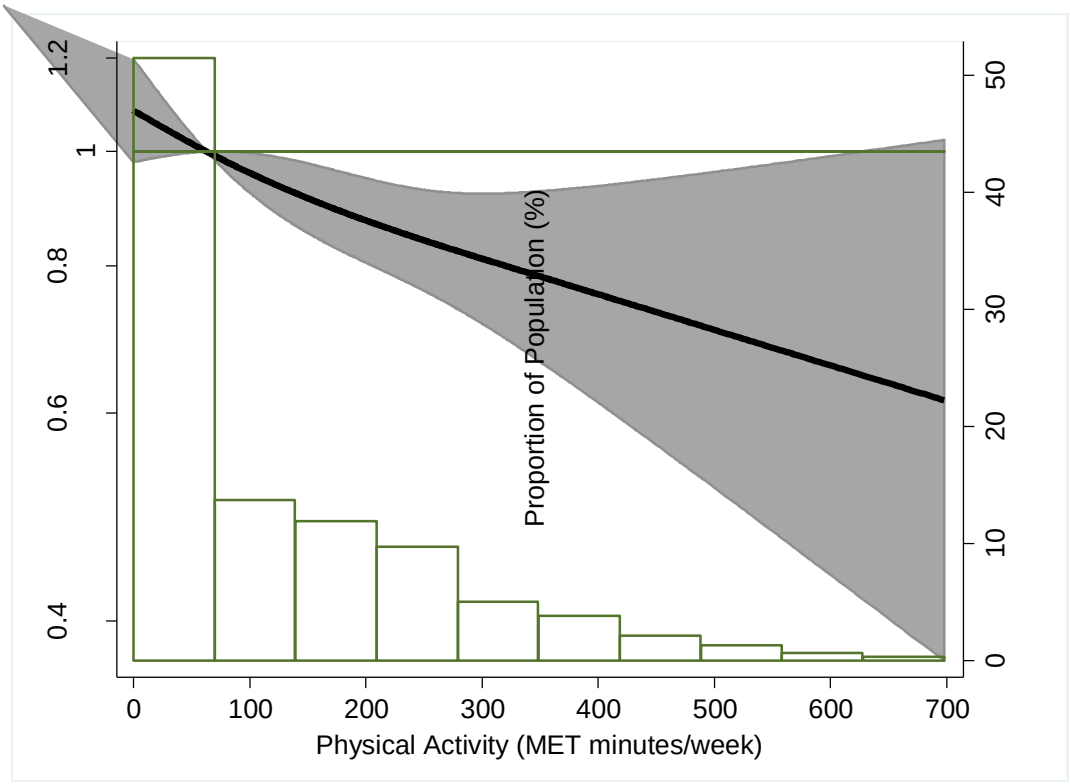
Supplemental Figure 5. Association of waist circumference with incidence of atrial fibrillation in women presented as hazard ratio (solid line) and 95% confidence intervals (shaded area). Results from Cox proportional hazards model using restricted cubic splines, adjusted for age and race. Median value of waist circumference was considered the reference (HR=1). The histograms represent the frequency distribution of the waist circumference in the study sample.



Supplemental Figure 6. Association of physical activity (moderate + vigorous) with incidence of atrial fibrillation in men presented as hazard ratio (solid line) and 95% confidence intervals (shaded area). Results from Cox proportional hazards model using restricted cubic splines, adjusted for age and race. Median value of physical activity was considered the reference (HR=1). The histograms represent the frequency distribution of the physical activity in the study sample.



Supplemental Figure 7. Association of physical activity (moderate + vigorous) with incidence of atrial fibrillation in women presented as hazard ratio (solid line) and 95% confidence intervals (shaded area). Results from Cox proportional hazards model using restricted cubic splines, adjusted for age and race. Median value of physical activity was considered the reference (HR=1). The histograms represent the frequency distribution of the physical activity in the study sample.



Supplemental Table 1. Mean body mass index (BMI) and mean metabolic equivalent (MET)-minutes for category of weight in men and women in the Atherosclerosis Risk in Communities Study (ARIC), 1987 – 2009

	Level of Physical Activity	N	AF Cases		Body mass index category		
					Normal (18.5-24.9 kg/m^2)	Overweight (25–29.9kg/m^2)	Obese (≥ 30 kg/m^2)
Men	Poor	2218	342	BMI (kg/m^2)	22.9	27.3	33.8
				MET-minutes	0	0	0
	Intermediate	1420	210	BMI (kg/m^2)	23.1	27.4	33.0
				MET-minutes	80.7	81.7	80.9
	Ideal	2807	435	BMI (kg/m^2)	23.1	27.2	32.8
				MET-minutes	311.8	302.4	302.6
Women	Poor	3109	335	BMI (kg/m^2)	22.5	27.4	35.7
				MET-minutes	0	0	0
	Intermediate	2064	215	BMI (kg/m^2)	22.5	27.4	35.1
				MET-minutes	81.9	79.3	76.4
	Ideal	2601	238	BMI (kg/m^2)	22.4	27.2	34.5
				MET-minutes	297.2	285.5	276.3

Supplemental Table 2.
Most common forms of physical activity in men and women in the Atherosclerosis Risk in Communities Study (ARIC), 1987 - 2009

MEN	n	**WOMEN**	n
Walking Briskly	941	Walking Briskly	1475
Gardening/Yard Work	685	Walking for Pleasure	572
Walking for Pleasure	557	Gardening/Yard Work	351
Golfing - Using Cart	357	Floor Exercise	291
Golfing - Walking & Carry Clubs	352	Bicycling <10 mph	290
Bicycling ≥10 mph	271	Bicycling ≥10 mph	261
Fishing from Bank or Boat	206	Bowling	219
Bowling	194	Dancing, Aerobic (low to moderate)	205
Mowing Lawn	189	Swim, Recreational	188
Hunting	185	Tennis	156

Supplemental Table 3. Hazard ratios (95% confidence intervals) for the association between relative weight change during follow up with risk of atrial fibrillation (AF) in men and women, Atherosclerosis Risk in Communities Study (ARIC), 1996 – 2009

		Weight change during follow-up*					$P_{quadratic\ trend}$**
		>5% loss	0-5% loss	Ref	5-9.9% gain	≥10% gain	
Men	n	543	864	1514	956	623	
	AF cases	88	98	154	113	87	
	HR (95% CI)	1.52 (1.16-1.99)	1.01 (0.79-1.31)	1.00	1.33 (1.04-1.70)	1.61 (1.24-2.11)	<0.0001
Women	n	702	887	1463	1223	1464	
	AF cases	84	86	108	101	107	
	HR (95% CI)	1.45 (1.08-1.93)	1.24 (0.93-1.64)	1.00	1.24 (0.94-1.62)	1.19 (0.90-1.55)	0.03

Ref = reference group that included individuals who gained 0-4.9% weight; *Adjusted for age, race, study site, education, income, prior cardiovascular disease, height, cigarette smoking, physical activity, and alcohol consumption. **Significant sex interaction (p = 0.01)

Supplemental Table 4. Association between sex-specific tertiles of physical activity level with risk of atrial fibrillation (AF) in men and women in the Atherosclerosis Risk in Communities Study (ARIC), 1987 - 2009

	N	Physical activity level tertiles			P_{trend} **
		Low	Middle	High	
Full Cohort	n	5327	4152	4720	
	AF Cases	677	494	604	
	HR (95% CI)*	1.00	0.95 (0.84-1.07)	0.89 (0.80-1.00)	0.06

*Adjusted for age, race, sex, study site, education, income, prior cardiovascular disease, cigarette smoking, height, and alcohol consumption. **Linear trend by physical activity group as an ordinal variable.
Non-significant sex interaction: 0.51

Supplemental Table 5. Impact of sex-specific tertiles of physical activity on the association between body mass index and overweight and obesity with risk of atrial fibrillation (AF) in men and women in the Atherosclerosis Risk in Communities Study (ARIC), 1987 – 2009

	PA Tertile		Body mass index category			P_{trend}*
			Normal (18.5-24.9 kg/m^2)	Overweight (25–29.9kg/m^2)	Obese (≥ 30 kg/m^2)	
Men	Low	N	598	1020	600	
		AF cases	60	149	133	
		HR (95% CI)	1.00	1.45 (1.07-1.97)	2.56 (1.86-3.50)	<0.0001
	Middle	N	576	1034	471	
		AF cases	72	152	92	
		HR (95% CI)	1.00	1.22 (0.92-1.62)	1.88 (1.37-2.58)	<0.0001
	High	N	597	1112	437	
		AF cases	85	171	73	
		HR (95% CI)	1.00	1.18 (0.90-1.53)	1.40 (1.02-1.94)	0.04
Women	Low	N	868	994	1247	
		AF cases	71	84	180	
		HR (95% CI)	1.00	1.04 (0.75-1.44)	1.90 (1.42-2.56)	<0.0001
	Middle	N	838	640	596	
		AF cases	71	56	85	
		HR (95% CI)	1.00	1.02 (0.71-1.45)	1.98 (1.41-2.78)	0.0001
	High	N	1173	867	551	
		AF cases	85	78	78	
		HR (95% CI)	1.00	1.19 (0.87-1.64)	2.02 (1.46-2.80)	<0.0001

Reference group = normal weight (18.5 < 24.9 kg/m^2); Adjusted for age, race, study site, education, income, prior cardiovascular disease, height, cigarette smoking, and alcohol consumption. *Linear trend by body mass index group as an ordinal variable. HR = hazard ratios (95% confidence intervals).

Supplemental Table 6. Impact of sex-specific tertiles of physical activity level on the association between waist circumference with risk of atrial fibrillation (AF) in men in the Atherosclerosis Risk in Communities Study (ARIC), 1987 - 2009

	Physical activity level		Waist circumference*				P_{trend}**
			≤92 (Ref)	93-98	99-105	≥106	
Men	Low	n	567	486	551	614	
		AF cases	45	59	97	141	
		HR (95% CI)	1.00	1.54 (1.04-2.28)	2.34 (1.63-3.36)	3.16 (2.22-4.49)	<0.0001
	Middle	n	542	512	527	500	
		AF cases	59	61	89	107	
		HR (95% CI)	1.00	0.94 (0.66-1.36)	1.37 (0.98-1.91)	1.83 (1.32-2.53)	0.001
	High	n	591	579	531	445	
		AF cases	71	86	85	87	
		HR (95% CI)	1.00	1.22 (0.89-1.68)	1.18 (0.86-1.63)	1.63 (1.19-2.25)	<0.0001

*Adjusted for age, race, study site, education, income, prior cardiovascular disease, height, cigarette smoking, and alcohol consumption**Linear trend by waist circumference group as an ordinal variable. P for interaction between physical activity level and waist circumference on risk of AF p = 0.11 (no interaction in women p = 0.89)

Supplemental Table 7. Impact of level of physical activity on the association between relative weight change during follow up with risk of atrial fibrillation (AF) in men and women, Atherosclerosis Risk in Communities Study (ARIC), 1996 – 2009

	Physical activity level		Weight change during follow-up*					$P_{interaction}$
			>5% loss	0-5% loss	Ref.	5-9.9% gained	≥10% gained	
Men	Poor	n	193	254	445	317	224	
		AF cases	33	26	48	37	29	
		HR (95% CI)	1.66 (1.05-2.63)	0.81 (0.50-1.31)	1.00	1.20 (0.78-1.84)	1.36 (0.85-2.17)	
	Intermediate	n	114	197	371	214	136	
		AF cases	16	21	40	19	23	
		HR (95% CI)	1.28 (0.71-2.31)	0.97 (0.57-1.65)	1.00	0.95 (0.55-1.66)	1.90 (1.12-3.22)	
	Ideal	n	236	413	698	425	263	
		AF cases	39	51	66	57	35	
		HR (95% CI)	1.50 (1.00-2.26)	1.21 (0.84-1.75)	1.00	1.63 (1.14-2.32)	1.74 (1.15-2.65)	0.71
Women	Poor	n	305	360	516	439	508	
		AF cases	38	40	36	40	39	
		HR (95% CI)	1.63 (1.02-2.58)	1.48 (0.94-2.33)	1.00	1.40 (0.89-2.21)	1.24 (0.78-1.96)	
	Intermediate	n	185	238	404	343	393	
		AF cases	23	23	31	31	34	
		HR (95% CI)	1.58 (0.91-2.74)	1.22 (0.70-2.10)	1.00	1.40 (0.84-2.31)	1.40 (0.85-2.31)	
	Ideal	n	212	289	543	441	563	
		AF cases	23	23	41	30	34	
		HR (95% CI)	1.23 (0.73-2.08)	0.95 (0.57-1.60)	1.00	0.96 (0.60-1.55)	0.98 (0.62-1.55)	0.96

Ref = reference group that included individuals who gained 0-4.9% weight; *Adjusted for age, race, study site, education, income, prior cardiovascular disease, height, cigarette smoking, and alcohol consumption. HR = Hazard ratio (95% confidence interval). P for interaction = interaction between weight change and physical activity level on risk of AF.