The Saint Vincents Screening To Prevent Heart Failure (STOP-HF) Study

A Multicentre, Prospective, Randomised, Controlled Trial of Natriuretic Peptide Based Screening And Collaborative Care To Reduce The Prevalence of Left Ventricular Dysfunction and Heart Failure

STOP-HF Investigators
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STOP-HF: Background

- Prevention of heart failure is a "Holy Grail" of cardiovascular care

- Present approaches are suboptimal

- Risk differentiation based on clinical criteria may be limited

- Biomarkers may help to focus care to where it is most needed

Individualizing Risk with NP

Framingham Cohort, Wang et al. NEJM 2004
NP predicts HF and CV Risk
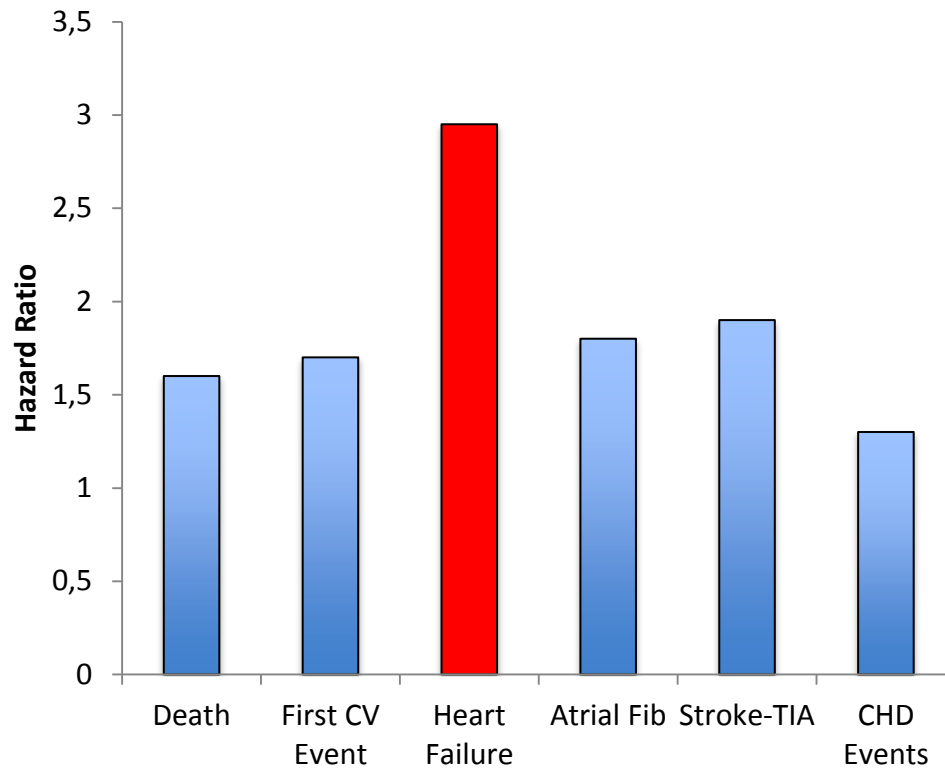
- Peptide secreted in response to
  - Pressure / Volume Overload
  - Ischemia
  - Fibro-inflammation
- Adds to routine risk prediction
- NP reflects established CV insult rather than risk of CV damage

STOP-HF Hypothesis

- NP-driven screening and targeted collaborative care in the general at-risk population will decrease the prevalence of LVD and HF

- 39 collaborating primary care practices, intervention provided in a single referral center
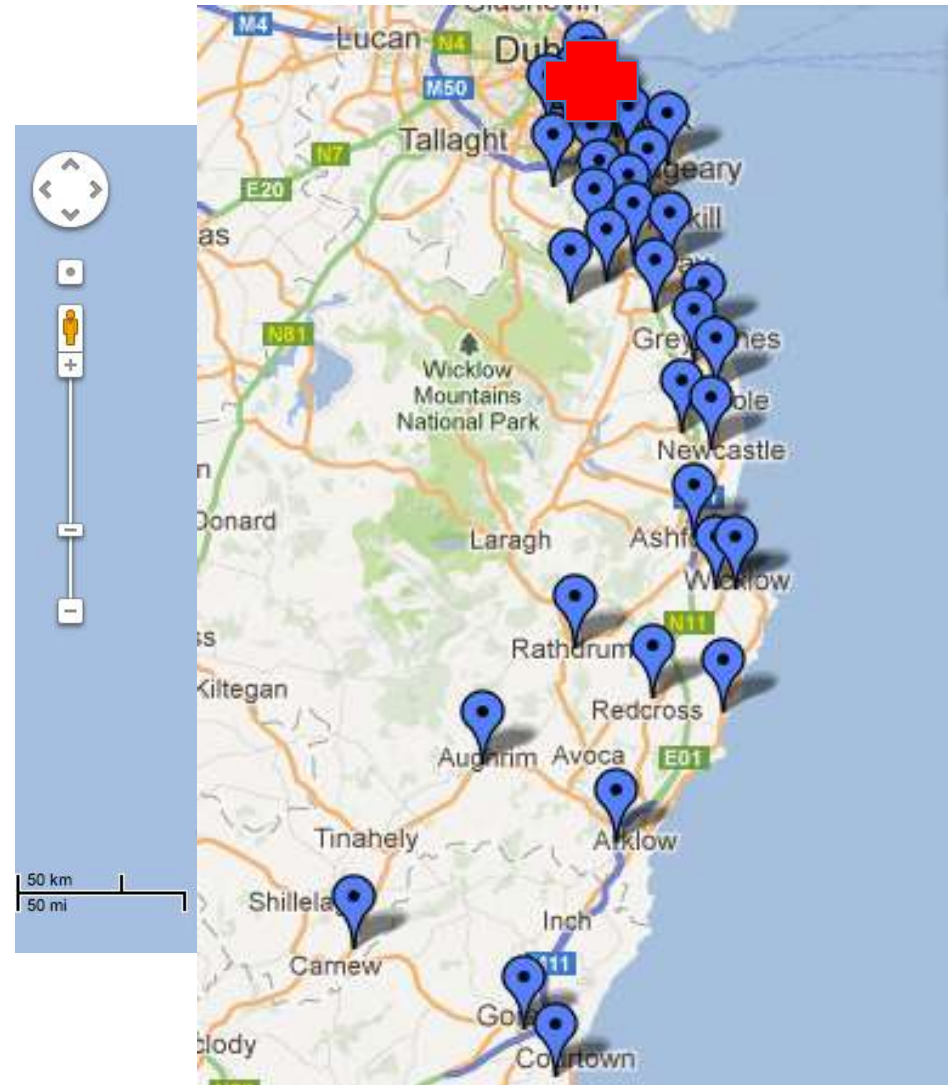
STOP-HF Inclusion / Exclusion

- Entry Criteria (> 40yrs) with
  - Hypertension
  - Hyperlipidemia
  - Diabetes
  - Vascular disease
  - Arrhythmia
  - Obesity

- Excluded
  - Known LVSD or HF
  - Life-threatening illness
  - Refusal / inability to give informed consent

- Primary End Point
  - Prevalence of heart failure (hospitalized) and asymptomatic left ventricular dysfunction
    - Systolic Dysfunction: LVEF < 50%
    - Diastolic Dysfunction: E / e prime > 15

- Secondary End Point
  - Hospitalization for Cardiovascular Events (Time to event and Event rate)
    - Heart Failure, Arrhythmia, Myocardial Infarction, Unstable angina, CVA, TIA, Peripheral Thrombosis, PE

Study Flow
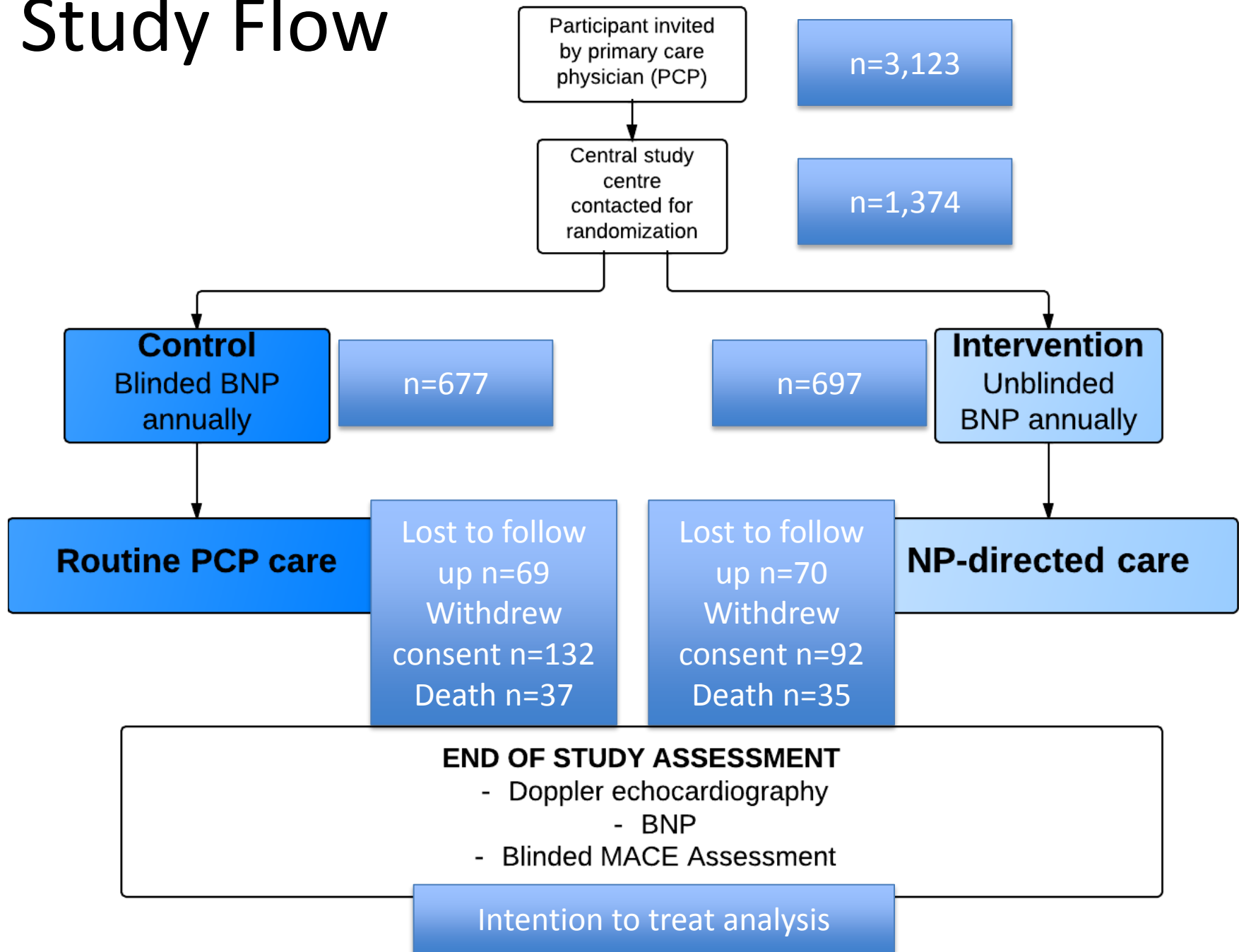
STOP-HF Intervention

Routine PCP care

- Annual BNP not available to clinicians
- At least annual review by PCP
- Cardiology review only if requested by PCP

NP-directed care

In addition to routine PCP care
- Annual BNP in all

If BNP >50pg/ml at any time
- Shared-care
  - Cardiology review
  - Echo-Doppler
  - Other CV investigations
  - CV nurse coaching
 - Regular Cardiology follow-up

Demographics

	All patients	
	Control	Intervention
N	677	697
Age, mean (SD), years	65.4 (10.3)	64.1 (10.1)
Male, N (%)	300 (44.3%)	323 (46.3%)
Hypertension, N (%)	419 (61.9%)	433 (62.1%)
Diabetes Mellitus, N (%)	123 (18.2%)	127 (18.2%)
Obesity, N (%)	193 (28.5%)	180 (25.8%)
Arrhythmia, N (%)	54 (8.0%)	48 (6.9%)
Valvular Disease, N (%)	3 (0.44%)	7 (1.0%)
Lipid Disorders, N (%)	376 (55.5%)	355 (50.9%)
Vascular disease, N (%)	23 (3.4%)	32 (4.6%)
Myocardial Infarction, N (%)	56 (8.3%)	73 (10.5%)
1 risk factor, N (%)	204 (30.1%)	204 (29.3%)
2 risk factors, N (%)	242 (35.8%)	241 (34.6%)
3 + risk factors, N (%)	180 (26.6%)	188 (27.0%)

Demographics

|	All patients	
	Control	Treatment
N	677	697
B-type NP, mean (SD), pg/mL	44.8 (57.5)	48.2 (84.9)
Total Cholesterol, mean (SD), mg/dL	182.1 (40.6)	182.7 (39.9)
LDL-Cholesterol, mean (SD),mg/dL	101.4 (34.3)	103.1 (36.4)
HDL-Cholesterol, mean (SD),mg/dL	50.5 (16.1)	49.3 (15.7)
Glucose, mean (SD), mg/dL	109.6 (37.6)	109.8 (37.8)
Creatinine, mean (SD), mg/dL	0.95 (0.22)	0.95 (0.23)
Body Mass Index, mean (SD), kg/m^2	28.0 (5.5)	27.7 (5.0)
Heart Rate, mean (SD), beats/minute	70 (12)	70 (12)
Systolic BP, mean (SD), mmHg	147.0 (22.5)	144.7 (20.9)
Diastolic BP, mean (SD), mmHg	80.5 (11.9)	81.1 (12.0)

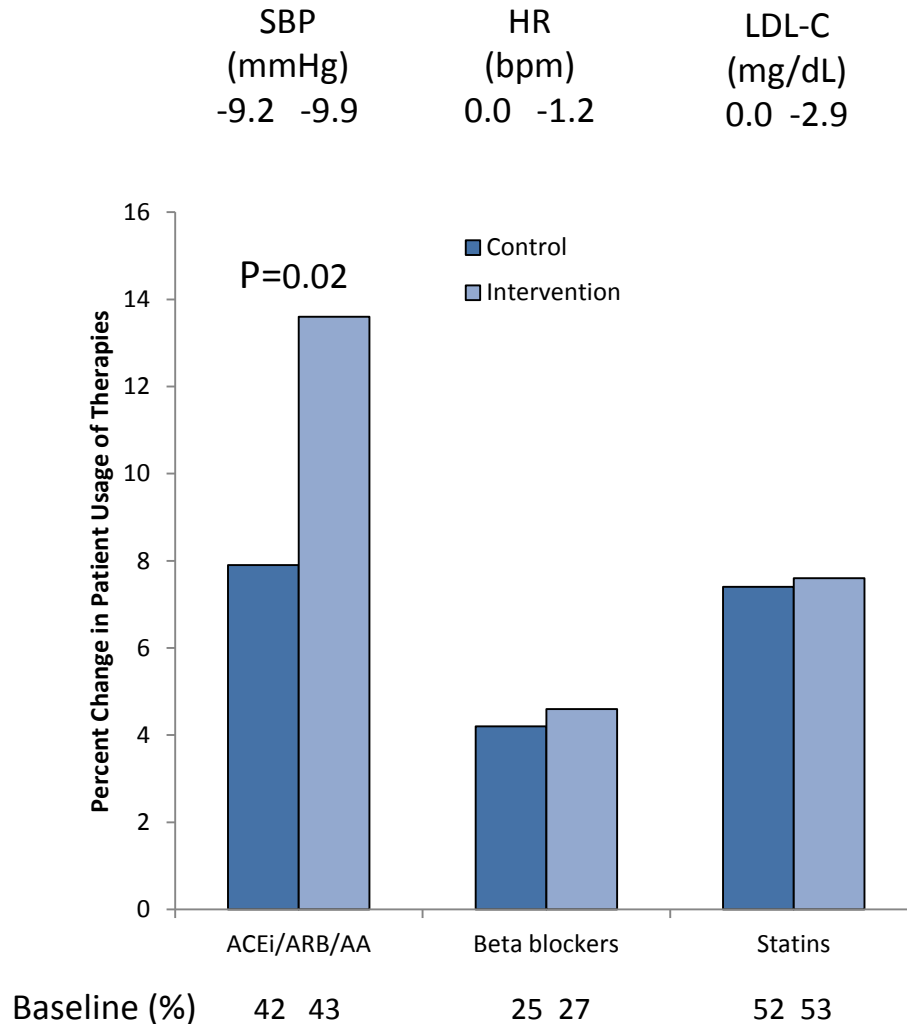# Primary Endpoint – HF and LVD
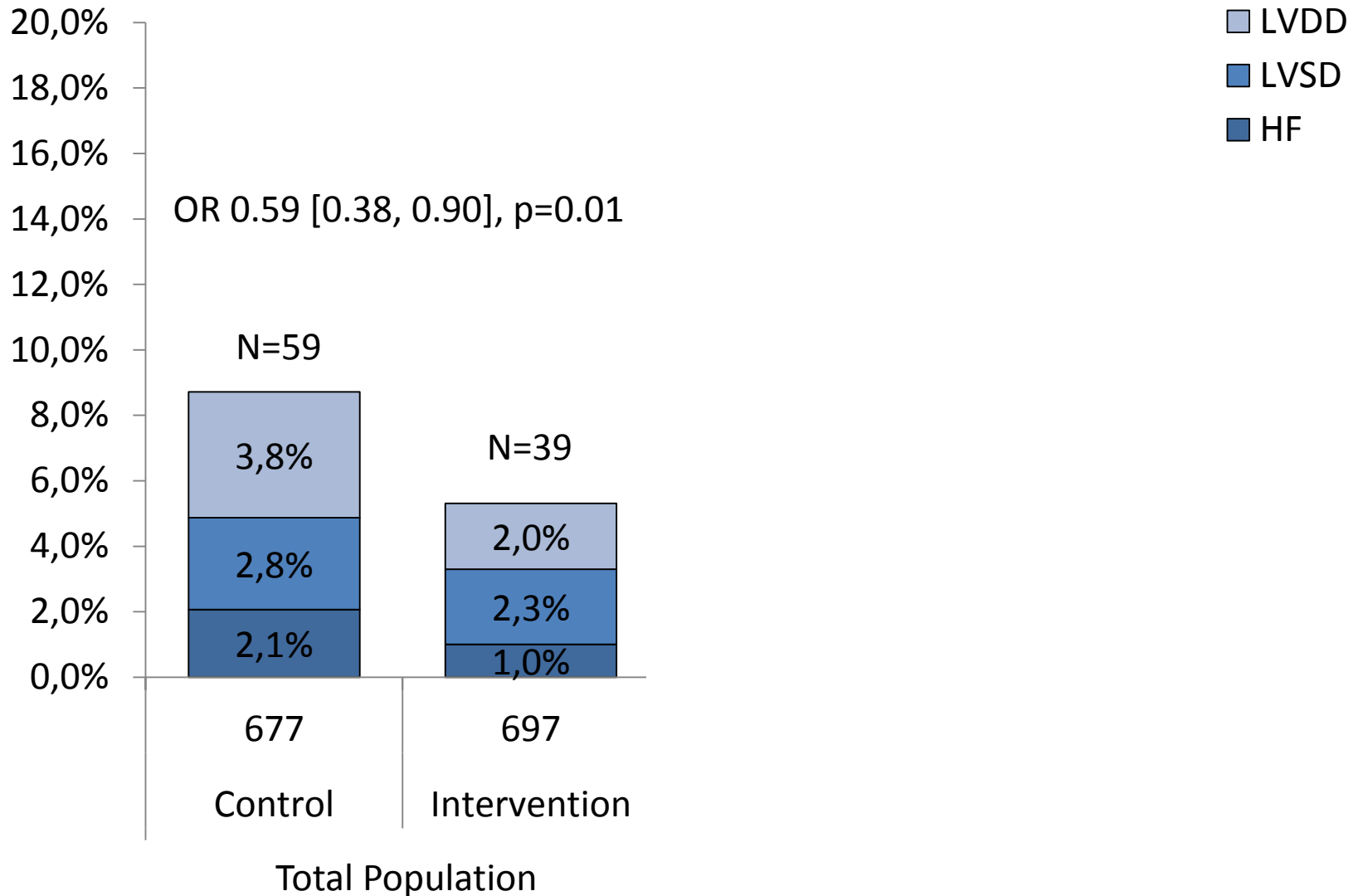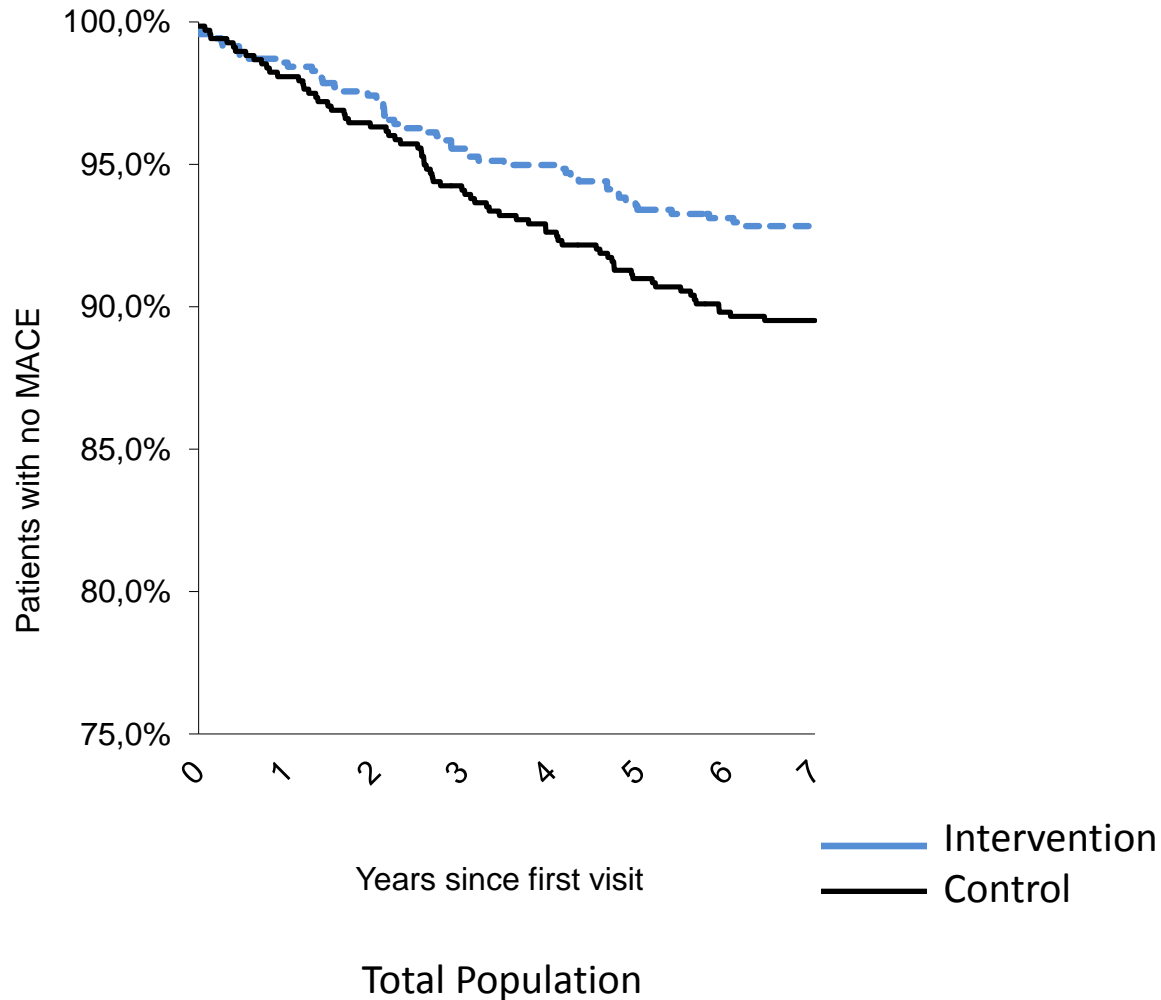
Endpoint – MACE Event Rate

Event Rate OR 0.54 p=0.001 vs. Control
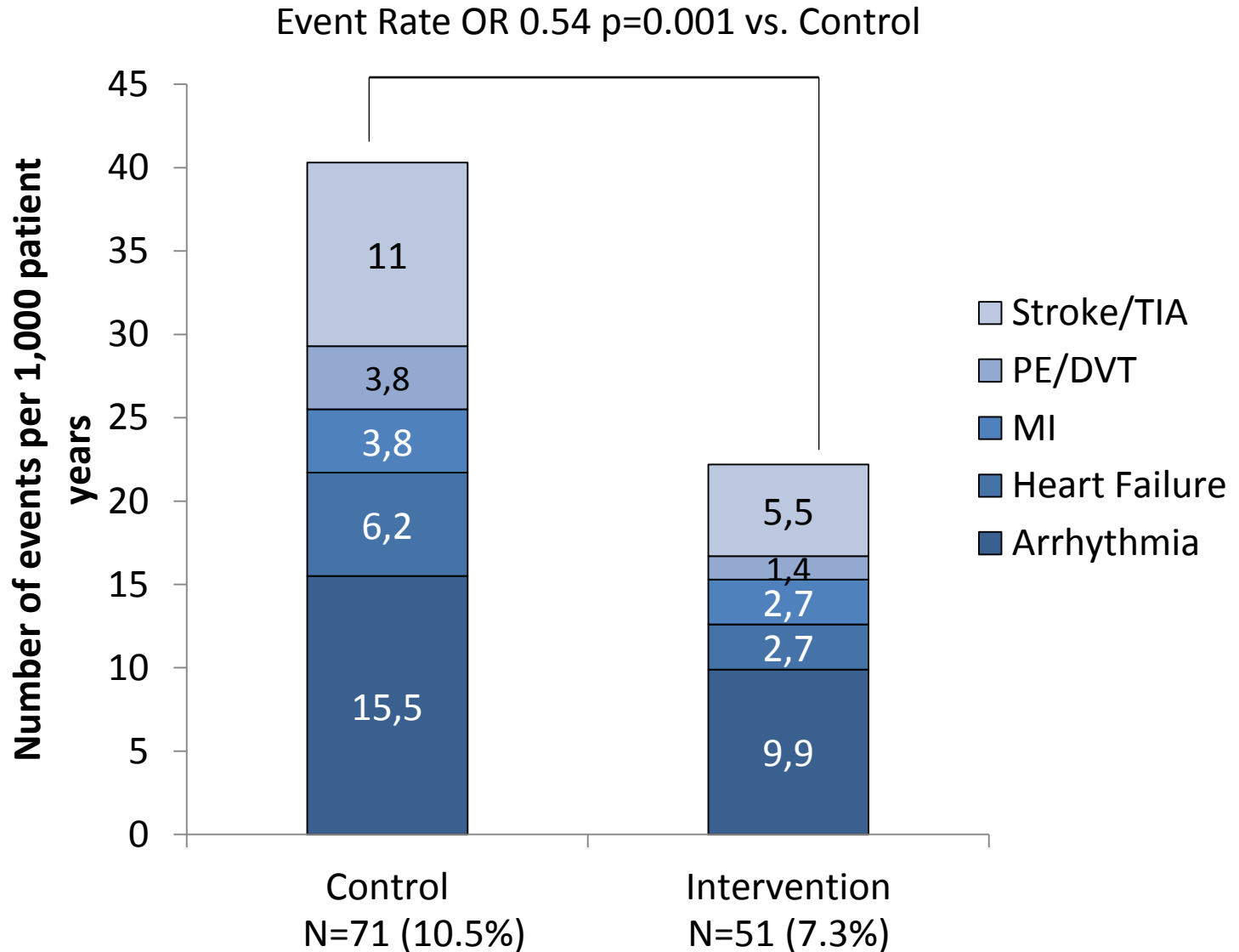
Therapies and Risk Factors

- BP significantly reduced within both groups (p<0.001) from baseline

- Increased use of RAAS modifying therapies in intervention group

- Trend to lower HR (p=0.09) and LDL-C (p=0.06) in high BNP subsets

- 75% of primary end-point in control group had BNP > 50pg/mL

Limitations

- One geographical region in one health system

- Self-selected PCP

- Unblinded study

- Multifactorial intervention

- Only included documented hospitalization events in MACE

STOP-HF Conclusion

- Natriuretic peptide-based screening and collaborative care targeted 4 in 10 at-risk patients

- Reduced the rates of left ventricular dysfunction, heart failure, and emergency hospitalizations for major cardiovascular events.

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