

## **Supplemental Material**

**Supplemental Figure 1. Event rate for CRT-D patients by binned PR interval.** A plot of the unadjusted incidence of heart failure hospitalization or death among CRT-D patients divided into subgroups based on PR interval using 10ms bins. The plot was fit with a linear spline function with a single knot at 170ms.

**Supplemental Figure 2. The unadjusted and adjusted associations between PR interval (across the continuous range) and outcomes among CRT-D patients.** Unadjusted and adjusted restricted cubic splines (with 5 knots at 5th, 25th, 50th, 75th, and 90<sup>th</sup> percentiles) depicting the association between PR interval and (log hazard) risk for HF hospitalization or death (**a**, unadjusted; **b**, adjusted), death (**c**, unadjusted; **d**, adjusted) and HF hospitalization (**e**, unadjusted; **f**, adjusted).

**Supplemental Table 1.** The baseline characteristics of the inverse probability weighted patient groups used for the primary comparative effectiveness analysis.

Variables	PR<230ms			PR≥230ms		
	ICD	CRT	% Standardized difference	ICD	CRT	% Standardized difference
Age (Mean)	75.1	75.2	-1.36	76.9	76.9	-0.69
Gender						
Male	63.30%	64.80%	-3.12	80.30%	82.50%	-5.51
Female	36.70%	35.20%	3.12	19.70%	17.50%	5.51
Race						
White non-Hispanic	86.30%	86.80%	-1.31	88.10%	89.60%	-4.48
Black non-Hispanic	7.60%	7.30%	1.27	7.00%	5.90%	4.34
Hispanic	4.20%	4.00%	0.9	3.60%	2.60%	5.45
Other	1.90%	1.90%	-0.47	1.30%	1.90%	-4.72
QRS duration						
120-129	13.70%	14.00%	-0.8	11.80%	12.40%	-1.8
130-139	14.50%	15.00%	-1.34	15.20%	14.30%	2.45
140-149	18.10%	17.90%	0.35	14.70%	15.30%	-1.78
150-159	18.30%	18.10%	0.75	15.80%	14.90%	2.33
160-169	16.00%	16.70%	-1.81	19.00%	17.20%	4.6
≥170	19.40%	18.40%	2.54	23.60%	25.90%	-5.23
Intraventricular Conduction						
Non-LBBB	30.40%	31.10%	-1.48	37.20%	37.70%	-1.02
LBBB	69.60%	68.90%	1.48	62.80%	62.30%	1.02
Non-Ischemic Dilated Cardiomyopathy						
No	62.80%	63.80%	-2.06	70.70%	73.50%	-6.15
Yes-Within the past 9 months	11.40%	11.60%	-0.51	8.50%	7.50%	3.74
Yes-Greater than 9 months	25.80%	24.70%	2.66	20.80%	19.00%	4.37
Ischemic Heart Disease	64.70%	65.70%	-2.26	71.40%	74.70%	-7.26
Atrial Fibrillation/Atrial Flutter	17.00%	17.50%	-1.38	27.70%	27.70%	0.02
Ventricular Tachycardia	16.50%	16.80%	-0.74	20.00%	20.10%	-0.28
Primary prevention	94.70%	94.70%	-0.21	94.40%	94.30%	0.4
NYHA class						
I	4.90%	5.10%	-0.67	4.20%	4.30%	-0.32
II	24.20%	24.60%	-1.08	24.50%	24.60%	-0.36
III	68.00%	67.60%	0.84	68.90%	68.00%	1.95
IV	2.90%	2.70%	1.32	2.40%	3.10%	-4.19
Previous PCI	32.30%	32.60%	-0.52	33.80%	34.20%	-0.96
Previous CABG	38.10%	38.10%	0.12	48.20%	50.10%	-3.92
Diabetes	37.30%	37.40%	-0.27	44.90%	42.00%	5.88
Previous MI	50.50%	51.70%	-2.38	54.10%	58.60%	-9.01
Chronic Lung Disease	23.90%	23.10%	1.99	18.80%	20.40%	-3.96
Cerebrovascular Disease	14.10%	14.80%	-2.04	16.50%	17.60%	-2.98
Renal Failure-Dialysis	2.40%	2.60%	-1.35	3.20%	3.20%	-0.13
Cardiac Arrest	2.30%	2.00%	2.07	1.50%	2.90%	-9.68
Hypertension	77.80%	77.90%	-0.3	80.50%	80.20%	0.81
Syncope	11.00%	10.30%	2.47	13.20%	11.00%	6.68
CHF Duration						

No	9.60%	10.00%	-1.62	8.50%	9.20%	-2.62
Less than 9 months	26.10%	25.80%	0.77	22.70%	22.70%	0.12
Greater than 9 months	64.30%	64.20%	0.3	68.80%	68.10%	1.49
EF %	24.4	24.7	-3.87	25.2	25.2	-1.04
GFR						
≥60	42.40%	42.70%	-0.55	36.50%	37.30%	-1.46
30-59	48.10%	48.00%	0.24	52.20%	51.20%	2.03
15-29	6.70%	6.20%	1.81	8.00%	8.20%	-0.65
<15	2.80%	3.10%	-1.72	3.30%	3.40%	-0.75
BUN Level						
≤ 20	42.60%	43.50%	-1.74	33.30%	34.20%	-1.84
20-40	46.90%	47.10%	-0.29	54.00%	52.00%	4.15
>40	10.50%	9.50%	3.37	12.70%	13.90%	-3.55
Sodium Level						
≤ 135	12.90%	12.50%	1.13	12.70%	13.10%	-1.17
135-145	85.60%	86.20%	-1.84	85.60%	85.20%	0.94
>145	1.50%	1.20%	2.27	1.70%	1.70%	0.46
Systolic BP						
≤ 100	5.50%	5.30%	0.62	5.20%	5.10%	0.46
100-130	41.80%	41.50%	0.63	37.40%	40.50%	-6.28
>130	52.70%	53.20%	-0.9	57.30%	54.40%	5.96
Angiotensin converting enzyme inhibitor	60.70%	60.70%	0.1	59.20%	58.40%	1.76
Amiodarone	7.90%	7.80%	0.16	15.40%	14.90%	1.53
Hydralazine	3.80%	3.70%	0.72	4.00%	4.60%	-2.59
Angiotensin receptor blocker	20.10%	20.80%	-1.81	21.10%	22.40%	-3.22
Aspirin	69.90%	72.50%	-5.74	70.50%	72.50%	-4.52
Beta-blocker	86.20%	87.00%	-2.31	83.40%	84.80%	-3.63
Warfarin	16.50%	16.40%	0.11	24.10%	23.60%	1.1
Digoxin	21.80%	21.50%	0.79	23.60%	25.50%	-4.45
Diuretic	67.40%	67.80%	-0.77	72.60%	72.20%	0.88
Long acting nitrate	11.50%	11.50%	0.09	12.20%	13.40%	-3.42
Clopidogrel	24.20%	23.80%	0.92	22.20%	23.80%	-3.67
Statin	65.80%	67.80%	-4.45	70.90%	70.40%	1
Dementia	2.50%	3.00%	-2.69	2.80%	2.90%	-0.82
Disability/frailty	6.50%	6.30%	1.06	7.00%	7.10%	-0.16
EP operator ICD training						
Board-certified EP/EP fellowship	79.60%	78.50%	2.74	82.40%	80.70%	4.47
Surgery board	1.20%	1.10%	1.17	1.00%	1.40%	-3.59
Other	19.10%	20.40%	-3.12	16.60%	17.90%	-3.55
Operator CRT volume						
≤20implants/year	56.70%	56.00%	1.53	58.20%	55.40%	5.82
>20implants/year	43.30%	44.00%	-1.53	41.80%	44.60%	-5.82
Region						
Other	2.70%	2.50%	0.96	3.10%	2.90%	1.2
New England	4.30%	4.20%	0.5	5.00%	4.20%	3.68
Atlantic	35.30%	33.60%	3.71	36.00%	32.10%	8.27
Central	45.30%	47.50%	-4.37	44.20%	48.10%	-7.84
Mountain	4.40%	4.20%	0.92	3.80%	4.00%	-0.96
Pacific	8.00%	8.00%	-0.1	7.90%	8.70%	-2.92
Teaching status						
Council of teaching hospitals	28.20%	28.20%	-0.12	30.10%	26.70%	7.46

Teaching hospital	27.80%	28.20%	-0.96	26.20%	28.80%	-5.96
Not teaching hospital	44.10%	43.60%	0.98	43.80%	44.50%	-1.42
Center CRT volume						
≤20implants/year	10.00%	10.10%	-0.33	7.30%	7.90%	-2.31
>20implants/year	90.00%	89.90%	0.33	92.70%	92.10%	2.31
Beds set up and staffed						
≤100	5.20%	5.30%	-0.64	4.40%	5.90%	-6.6
100-500	60.80%	60.40%	0.85	64.80%	62.10%	5.6
>500	34.00%	34.30%	-0.57	30.80%	32.00%	-2.67
Implant year						
2006	18.20%	17.60%	1.39	19.80%	18.20%	4.11
2007	19.40%	19.00%	1.11	19.80%	21.80%	-4.73
2008	20.40%	22.10%	-4.29	21.10%	21.10%	0.02
2009	22.00%	21.70%	0.69	19.30%	21.10%	-4.57
2010	20.10%	19.60%	1.25	20.00%	17.80%	5.45

BUN = blood urea nitrogen, BP = blood pressure, CABG = coronary artery bypass grafting, CHF = congestive heart failure, EF = ejection fraction, GFR = glomerular filtration rate, LBBB = left bundle branch block, MI = myocardial infarction, NYHA = New York Heart Association, PCI = percutaneous coronary intervention

**Supplemental Table 2.** Multivariable adjusted\* association between CRT-D vs. ICD and outcomes among patients when stratified by PR interval

	<b>PR&gt;230ms</b>		<b>PR≥230ms</b>	
<b>Endpoint</b>	<b>HR/SHR 95%CI</b>	<b>P-value</b>	<b>HR/SHR 95%CI</b>	<b>P-value</b>
HF Hospitalization or death	0.819 ( 0.769 - 0.873 )	<0.0001	0.926 ( 0.815 - 1.051 )	0.24
Death	0.806 ( 0.747 - 0.870 )	<0.0001	0.867 ( 0.743 - 1.012 )	0.07
HF Hospitalization	0.860 ( 0.795 - 0.931 )	0.0002	0.924 ( 0.791 - 1.079 )	0.32

\*Fully adjusted model including an interaction term for device type and PR interval  
 CRT-D = cardiac resynchronization therapy with defibrillator, confidence interval = CI, Hazard ratio = HR, HF = heart failure, implantable cardioverter defibrillator = ICD, SHR = subdistribution hazard ratio

**Supplemental Table 3.** The baseline characteristics of the inverse probability weighted patient groups used for the comparative effectiveness analysis assessing patients with a LBBB QRS morphology.

Variables	PR<230ms			PR≥230ms		
	ICD	CRT	% Standardized difference	ICD	CRT	% Standardized difference
Age (Mean)	75.1	75.2	-1.15	76.7	76.9	-4.22
Gender						
Male	56.20%	57.60%	-2.69	75.40%	78.30%	-6.82
Female	43.80%	42.40%	2.69	24.60%	21.70%	6.82
Race						
White non-Hispanic	86.30%	87.10%	-2.41	87.70%	89.50%	-5.66
Black non-Hispanic	7.70%	7.20%	1.75	8.00%	6.40%	6.3
Hispanic	4.30%	3.90%	2.06	3.30%	2.30%	6.37
Other	1.80%	1.90%	-0.34	1.00%	1.90%	-7.48
QRS duration						
120-129	8.70%	8.90%	-0.53	7.20%	8.30%	-4.08
130-139	11.60%	12.10%	-1.47	11.50%	11.40%	0.24
140-149	17.50%	17.70%	-0.71	15.00%	15.60%	-1.72
150-159	20.00%	19.80%	0.54	15.00%	14.70%	0.86
160-169	18.50%	19.10%	-1.51	21.70%	19.50%	5.45
≥170	23.70%	22.40%	3.01	29.60%	30.50%	-1.92
Non-Ischemic Dilated Cardiomyopathy						
No	55.30%	55.90%	-1.31	64.40%	67.80%	-7.08
Yes-Within the past 9 months	13.20%	13.50%	-0.66	11.10%	9.00%	7.07
Yes-Greater than 9 months	31.50%	30.60%	1.89	24.50%	23.20%	2.88
Ischemic HD	57.10%	58.40%	-2.54	67.00%	70.10%	-6.54
Atrial Fibrillation/Atrial Flutter	15.50%	16.00%	-1.45	26.10%	27.70%	-3.57
Ventricular Tachycardia	15.30%	15.40%	-0.24	19.00%	16.20%	7.34
Primary prevention	95.30%	95.70%	-1.59	95.50%	95.70%	-0.71
NYHA class						
I	3.90%	3.90%	0.07	3.30%	3.10%	1.27
II	20.60%	21.00%	-0.92	20.90%	21.10%	-0.45
III	72.20%	72.30%	-0.15	73.20%	72.60%	1.52
IV	3.30%	2.90%	2.46	2.50%	3.20%	-4.25
Previous PCI	29.30%	29.30%	0.03	27.80%	31.50%	-8.26
Previous CABG	32.10%	31.80%	0.64	41.00%	44.10%	-6.18
Diabetes	36.00%	35.70%	0.61	44.80%	41.30%	6.98
Previous MI	43.50%	44.30%	-1.48	48.20%	53.10%	-9.81
Chronic Lung Disease	23.70%	22.20%	3.72	16.20%	19.10%	-7.48
Cerebrovascular Disease	13.10%	13.70%	-1.79	14.70%	15.90%	-3.23
Renal Failure-Dialysis	2.20%	2.40%	-1.04	3.40%	3.00%	2.58
Cardiac Arrest	2.00%	1.60%	2.77	0.70%	1.50%	-7.5
Hypertension	77.60%	77.40%	0.48	78.20%	78.00%	0.59
Syncope	11.00%	10.10%	2.97	12.20%	10.20%	6.37
CHF Duration						
No	7.40%	7.60%	-0.76	6.50%	6.70%	-0.81

Less than 9 months	26.80%	26.60%	0.43	24.60%	23.50%	2.5
Greater than 9 months	65.80%	65.80%	0.02	68.90%	69.70%	-1.88
EF %	24	24.3	-5.31	24.5	24.8	-5.33
GFR						
≥60	42.40%	42.20%	0.35	36.60%	36.20%	0.72
30-59	47.80%	48.60%	-1.66	51.50%	52.20%	-1.41
15-29	7.20%	6.40%	3.3	8.40%	8.40%	-0.19
<15	2.60%	2.80%	-1.07	3.60%	3.10%	2.29
BUN Level						
≤ 20	42.60%	43.40%	-1.6	32.90%	34.90%	-4.31
20-40	46.40%	47.00%	-1.29	54.20%	51.60%	5.17
>40	11.00%	9.60%	4.73	12.90%	13.40%	-1.6
Sodium Level						
≤ 135	12.90%	12.30%	1.66	12.80%	12.80%	0.05
135-145	85.90%	86.50%	-1.81	85.30%	85.60%	-0.86
>145	1.20%	1.20%	0.65	1.90%	1.60%	2.19
Systolic BP						
≤ 100	5.60%	5.10%	2.04	4.90%	4.80%	0.45
100-130	42.00%	41.70%	0.68	35.30%	40.60%	-11.02
>130	52.40%	53.20%	-1.59	59.80%	54.60%	10.61
Angiotensin converting enzyme inhibitor	60.90%	61.10%	-0.24	61.00%	58.70%	4.76
Amiodarone	7.40%	7.30%	0.31	16.50%	14.10%	6.43
Hydralazine	3.60%	3.60%	0	4.20%	4.90%	-3.17
Angiotensin receptor blocker	20.30%	21.10%	-2	21.00%	22.90%	-4.59
Aspirin	67.80%	71.10%	-7.08	66.70%	71.00%	-9.15
Beta-blocker	86.40%	87.60%	-3.67	84.60%	86.40%	-5.24
Warfarin	14.80%	15.20%	-0.87	23.10%	23.80%	-1.55
Digoxin	21.70%	21.80%	-0.25	24.00%	26.40%	-5.41
Diuretic	68.20%	68.40%	-0.47	73.10%	72.60%	1.08
Long acting nitrate	10.60%	10.80%	-0.63	9.80%	12.40%	-8.33
Clopidogrel	22.40%	21.90%	1.28	17.50%	21.90%	-11.11
Statin	62.80%	65.80%	-6.07	67.90%	68.20%	-0.65
Dementia	2.50%	2.70%	-1.3	3.40%	2.90%	2.71
Disability/frailty	6.00%	5.80%	0.72	7.50%	6.10%	5.3
EP operator ICD training						
Board-certified EP/EP fellowship	80.50%	80.10%	0.95	84.10%	82.40%	4.53
Surgery board	1.20%	1.10%	1.31	1.30%	0.90%	3.5
Other	18.30%	18.80%	-1.32	14.60%	16.70%	-5.66
Operator CRT volume						
≤20 implants/year	56.70%	55.00%	3.48	60.20%	54.60%	11.38
>20 implants/year	43.30%	45.00%	-3.48	39.80%	45.40%	-11.38
Region						
Other	2.80%	2.70%	0.62	3.50%	3.40%	0.63
New England	4.70%	4.60%	0.4	5.70%	4.50%	5.18
Atlantic	35.90%	33.40%	5.37	38.00%	32.00%	12.59
Central	43.90%	46.80%	-5.84	42.10%	47.60%	-11.06
Mountain	4.40%	4.30%	0.66	4.30%	4.40%	-0.55
Pacific	8.30%	8.20%	0.1	6.30%	8.00%	-6.37
Teaching status						
Council of teaching hospitals	27.90%	29.00%	-2.4	33.70%	28.40%	11.56
Teaching hospital	28.00%	28.20%	-0.48	24.80%	28.00%	-7.42
Not teaching hospital	44.10%	42.80%	2.62	41.50%	43.60%	-4.2
Center CRT volume						
≤20 implants/year	9.70%	9.30%	1.45	6.10%	7.80%	-6.74
>20 implants/year	90.30%	90.70%	-1.45	93.90%	92.20%	6.74
Beds set up and staffed						



<=100	4.70%	5.20%	-2.2	3.10%	5.70%	-12.84
100-500	61.30%	59.80%	3.12	66.80%	60.60%	13.07
>500	34.00%	35.00%	-2.21	30.10%	33.70%	-7.82
Implant year						
2006	18.50%	18.00%	1.16	21.20%	19.40%	4.37
2007	18.70%	18.70%	0.03	17.50%	21.20%	-9.27
2008	19.50%	21.80%	-5.81	20.40%	21.20%	-2.03
2009	21.80%	21.70%	0.33	17.40%	19.60%	-5.89
2010	21.60%	19.80%	4.34	23.60%	18.60%	12.3

BUN = blood urea nitrogen, BP = blood pressure, CABG = coronary artery bypass grafting, CHF = congestive heart failure, EF = ejection fraction, GFR = glomerular filtration rate, LBBB = left bundle branch block, MI = myocardial infarction, NYHA = New York Heart Association, PCI = percutaneous coronary intervention

**Supplemental Table 4.** The baseline characteristics of the inverse probability weighted patient groups used for the comparative effectiveness analysis assessing patients with a non-LBBB QRS morphology.

Variables	PR<230ms			PR≥230ms		
	ICD	CRT	% Standardized difference	ICD	CRT	% Standardized difference
Age (Mean)	75	75.1	-1.41	77.1	77	1.58
Gender						
Male	80.40%	81.40%	-2.44	89.90%	90.00%	-0.18
Female	19.60%	18.60%	2.44	10.10%	10.00%	0.18
Race						
White non-Hispanic	85.40%	86.10%	-1.87	90.80%	89.90%	2.99
Black non-Hispanic	7.40%	7.50%	-0.52	4.60%	5.10%	-2.26
Hispanic	4.70%	4.30%	1.8	2.90%	2.80%	0.39
Other	2.50%	2.10%	2.77	1.70%	2.20%	-3.36
QRS duration						
120-129	25.70%	26.30%	-1.49	19.90%	19.80%	0.13
130-139	20.70%	20.90%	-0.53	18.10%	18.00%	0.48
140-149	18.80%	18.00%	1.97	13.80%	15.30%	-4.24
150-159	14.30%	13.90%	1.08	17.30%	15.80%	4.12
160-169	11.10%	11.40%	-1.06	13.30%	12.90%	1.26
≥170	9.50%	9.40%	0.22	17.50%	18.20%	-1.82
Non-Ischemic Dilated Cardiomyopathy						
No	80.60%	81.50%	-2.46	80.90%	83.90%	-7.83
Yes-Within the past 9 months	7.40%	7.50%	-0.4	3.00%	4.60%	-8.11
Yes-Greater than 9 months	12.00%	11.00%	3.36	16.10%	11.50%	13.14
Ischemic HD	82.30%	82.60%	-0.7	79.10%	83.40%	-11.16
Atrial Fibrillation/Atrial Flutter	20.40%	20.60%	-0.5	27.70%	27.70%	0.01
Ventricular Tachycardia	20.50%	19.90%	1.5	24.80%	26.00%	-2.87
Primary prevention	93.10%	92.40%	2.67	93.90%	92.10%	7.32
NYHA class						
I	7.20%	6.30%	3.8	5.60%	8.30%	-10.82
II	33.10%	35.50%	-4.94	30.00%	29.70%	0.56
III	57.80%	56.10%	3.56	62.90%	59.20%	7.69
IV	1.80%	2.20%	-2.64	1.50%	2.80%	-8.62
Previous PCI	38.70%	39.80%	-2.22	40.10%	37.80%	4.73
Previous CABG	52.40%	52.20%	0.39	57.80%	61.80%	-8.17
Diabetes	40.70%	41.00%	-0.58	41.90%	43.20%	-2.56
Previous MI	67.50%	68.70%	-2.73	66.00%	68.30%	-5.02
Chronic Lung Disease	26.20%	25.00%	2.81	21.20%	21.50%	-0.83
Cerebrovascular Disease	17.30%	17.40%	-0.41	18.30%	19.40%	-2.79
Renal Failure-Dialysis	2.90%	3.20%	-1.78	3.40%	4.10%	-3.59
Cardiac Arrest	3.10%	2.90%	1.32	3.10%	5.40%	-11.39
Hypertension	79.20%	78.90%	0.78	82.80%	84.90%	-5.55
Syncope	11.40%	10.40%	3.13	13.10%	11.90%	3.67
CHF Duration						
No	14.50%	16.00%	-4.17	11.70%	15.30%	-10.34
Less than 9 months	24.50%	23.60%	1.98	21.70%	21.10%	1.38
Greater than 9 months	61.00%	60.30%	1.34	66.60%	63.60%	6.22
EF %	25.6	25.6	0.67	26	25.9	1.21
GFR						
≥60	41.90%	43.80%	-3.75	36.30%	40.10%	-7.68
30-59	49.10%	46.50%	5.24	53.80%	48.20%	11.16
15-29	5.60%	5.80%	-1.06	6.40%	7.30%	-3.55

<15	3.40%	3.90%	-2.77	3.40%	4.40%	-4.85
BUN Level						
≤ 20	41.90%	44.00%	-4.29	31.60%	31.90%	-0.46
20-40	48.60%	46.90%	3.48	56.00%	54.00%	4.16
>40	9.50%	9.20%	1.32	12.30%	14.20%	-5.49
Sodium Level						
≤ 135	12.20%	12.80%	-1.6	12.70%	13.10%	-1.35
135-145	86.00%	86.00%	-0.22	85.90%	85.30%	1.75
>145	1.80%	1.20%	4.94	1.40%	1.60%	-1.32
Systolic BP						
≤ 100	5.50%	5.90%	-1.65	4.20%	5.40%	-5.73
100-130	40.80%	40.60%	0.38	42.50%	39.50%	6.2
>130	53.70%	53.50%	0.4	53.30%	55.10%	-3.66
Angiotensin converting enzyme inhibitor	59.90%	59.50%	0.7	58.30%	57.80%	1.05
Amiodarone	8.90%	8.70%	0.77	15.90%	15.30%	1.63
Hydralazine	4.00%	3.90%	0.48	3.60%	4.20%	-2.95
Angiotensin receptor blocker	19.80%	20.30%	-1.15	20.10%	21.10%	-2.45
Aspirin	75.80%	76.00%	-0.53	74.70%	75.80%	-2.57
Beta-blocker	85.50%	85.80%	-0.92	82.60%	79.70%	7.38
Warfarin	19.10%	18.80%	0.73	27.60%	22.70%	11.4
Digoxin	21.00%	20.10%	2.16	21.30%	23.70%	-5.68
Diuretic	65.50%	65.70%	-0.57	71.60%	72.00%	-0.86
Long acting nitrate	12.70%	12.90%	-0.34	14.30%	14.50%	-0.66
Clopidogrel	29.20%	28.50%	1.51	27.30%	27.00%	0.82
Statin	71.90%	72.60%	-1.65	73.90%	75.40%	-3.49
Dementia	2.30%	3.60%	-7.81	2.90%	2.70%	1.03
Disability/frailty	6.50%	6.90%	-1.58	7.60%	8.50%	-2.96
EP operator ICD training						
Board-certified EP/EP fellowship	77.60%	74.80%	6.46	79.80%	76.00%	9.21
Surgery board	1.10%	1.00%	0.72	1.70%	3.10%	-9.05
Other	21.30%	24.10%	-6.74	18.50%	20.90%	-6.11
Operator CRT volume						
≤20 implants/year	57.40%	59.20%	-3.75	55.40%	57.70%	-4.73
>20 implants/year	42.60%	40.80%	3.75	44.60%	42.30%	4.73
Region						
Other	2.40%	2.10%	1.99	2.60%	2.60%	-0.32
New England	3.80%	3.70%	0.73	6.10%	3.40%	12.66
Atlantic	35.60%	34.10%	3.08	30.90%	32.60%	-3.67
Central	46.60%	48.80%	-4.41	48.20%	46.90%	2.53
Mountain	4.20%	4.00%	0.95	3.00%	3.20%	-1.39
Pacific	7.50%	7.40%	0.43	9.30%	11.20%	-6.41
Teaching status						
Council of teaching hospitals	27.60%	26.20%	3.24	28.70%	23.60%	11.74
Teaching hospital	28.00%	28.40%	-0.94	26.60%	30.90%	-9.52
Not teaching hospital	44.40%	45.40%	-2.04	44.70%	45.50%	-1.69
Center CRT volume						
≤20 implants/year	11.10%	12.50%	-4.28	8.80%	7.20%	6.02
>20 implants/year	88.90%	87.50%	4.28	91.20%	92.80%	-6.02
Beds set up and staffed						
≤100	5.70%	5.40%	1.45	5.50%	5.90%	-1.51
100-500	60.60%	62.00%	-2.79	64.40%	66.10%	-3.59
>500	33.70%	32.70%	2.18	30.10%	28.10%	4.54
Implant year						
2006	16.80%	16.80%	-0.04	16.20%	16.10%	0.31
2007	20.10%	19.00%	2.66	21.20%	21.40%	-0.46
2008	20.60%	22.90%	-5.48	18.70%	20.40%	-4.25
2009	22.50%	21.70%	1.81	25.50%	25.70%	-0.64
2010	20.00%	19.50%	1.18	18.40%	16.40%	5.37

BUN = blood urea nitrogen, BP = blood pressure, CABG = coronary artery bypass grafting, CHF = congestive heart failure, EF = ejection fraction, GFR = glomerular filtration rate, LBBB = left bundle branch block, MI = myocardial infarction, NYHA = New York Heart Association, PCI = percutaneous coronary intervention

<b>Supplemental Table 5.</b> Association between CRT-D vs. ICD and falsification endpoints among all patients and among subgroups when stratified by PR interval and QRS characteristics.					
Group	Outcome	PR < 230		PR ≥ 230ms	
		HR/SHR 95%CI	P-value	HR/SHR 95%CI	P-value
All patients	Gastrointestinal Bleed	1.080 (0.935-1.247)	0.30	0.870 (0.659-1.150)	0.33
	Bone disorder / Fracture	0.962 (0.880-1.053 )	0.40	0.998 (0.823-1.209)	0.98
Non-LBBB	Gastrointestinal Bleed	0.899 (0.732-1.104)	0.31	0.971 (0.633-1.491)	0.89
	Bone disorder / Fracture	1.028 (0.892-1.186)	0.69	0.779 (0.579-1.047)	0.10
LBBB	Gastrointestinal Bleed	1.181 (0.969-1.439)	0.10	0.777 (0.531-1.136)	0.19
	Bone disorder / Fracture	0.946 (0.846-1.058)	0.33	1.147 (0.864-1.524)	0.34

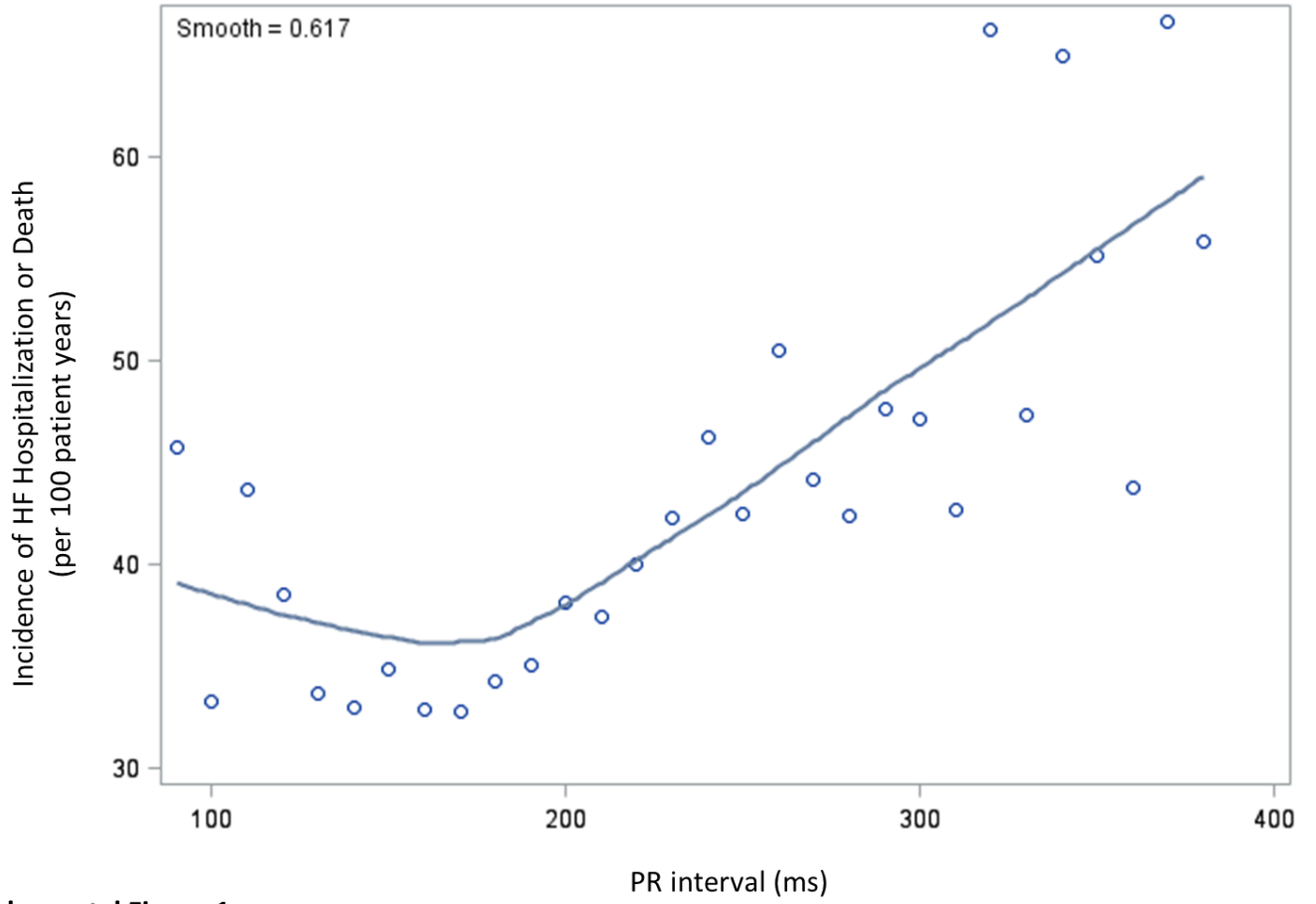
**Supplemental Table 6.** Baseline characteristics of the inverse probability weighted subgroups constructed for the sensitivity analysis.

Variables	PR<180ms			180≤PR<230ms			PR≥230ms		
	ICD	CRT	% Standardized difference	ICD	CRT	% Standardized difference	ICD	CRT	% Standardized difference
Age (Mean)	74.7	74.8	-1.37	75.4	75.5	-0.92	76.9	76.9	-0.69
Gender									
Male	58.60%	59.40%	-1.47	68.20%	69.70%	-3.25	80.30%	82.50%	-5.51
Female	41.40%	40.60%	1.47	31.80%	30.30%	3.25	19.70%	17.50%	5.51
Race									
White non-Hispanic	85.2%	86.1%	-2.66	87.40%	87.40%	0.02	88.10%	89.60%	-4.48
Black non-Hispanic	8.2%	7.5%	2.6	7.10%	7.10%	0.24	7.00%	5.90%	4.34
Hispanic	4.6%	4.3%	1.27	3.60%	3.70%	-0.62	3.60%	2.60%	5.45
Other	2.0%	2.0%	-0.22	1.90%	1.90%	0.35	1.30%	1.90%	-4.72
QRS duration									
120-129	13.70%	14.10%	-1.08	13.70%	13.60%	0.26	11.80%	12.40%	-1.8
130-139	15.40%	16.10%	-1.8	13.70%	14.00%	-0.7	15.20%	14.30%	2.45
140-149	19.80%	19.70%	0.36	16.60%	16.40%	0.58	14.70%	15.30%	-1.78
150-159	19.50%	19.20%	0.84	17.40%	17.10%	0.94	15.80%	14.90%	2.33
160-169	15.20%	15.90%	-1.9	16.60%	17.40%	-2.07	19.00%	17.20%	4.6
≥170	16.30%	15.10%	3.41	21.80%	21.50%	0.88	23.60%	25.90%	-5.23
Intraventricular Conduction									
Non-LBBB	29.60%	30.00%	-0.97	31.30%	32.10%	-1.65	37.20%	37.70%	-1.02
LBBB	70.40%	70.00%	0.97	68.70%	67.90%	1.65	62.80%	62.30%	1.02
Non-Ischemic Dilated Cardiomyopathy									
No	62.00%	61.70%	0.57	64.10%	65.70%	-3.3	70.70%	73.50%	-6.15
Yes-Within the past 9 months	12.80%	13.30%	-1.53	9.90%	9.80%	0.02	8.50%	7.50%	3.74
Yes-Greater than 9 months	25.20%	25.00%	0.55	26.00%	24.40%	3.61	20.80%	19.00%	4.37
Ischemic Heart Disease	63.40%	63.80%	-0.82	66.60%	67.50%	-1.98	71.40%	74.70%	-7.26
Atrial Fibrillation/Atrial Flutter	14.90%	15.80%	-2.61	18.80%	19.00%	-0.65	27.70%	27.70%	0.02
Ventricular Tachycardia	15.80%	16.50%	-2.04	17.20%	16.80%	1.05	20.00%	20.10%	-0.28
Primary prevention	94.60%	94.50%	0.45	94.90%	95.00%	-0.6	94.40%	94.30%	0.4
NYHA class									
I	4.60%	4.60%	0.31	5.20%	5.60%	-1.77	4.20%	4.30%	-0.32
II	24.50%	25.00%	-1.08	23.90%	24.10%	-0.66	24.50%	24.60%	-0.36
III	68.20%	67.60%	1.13	67.70%	67.70%	0.05	68.90%	68.00%	1.95
IV	2.70%	2.80%	-0.79	3.20%	2.50%	3.98	2.40%	3.10%	-4.19
Previous PCI	33.00%	32.00%	2.23	31.90%	33.10%	-2.47	33.80%	34.20%	-0.96
Previous CABG	34.80%	35.50%	-1.51	41.90%	40.50%	2.82	48.20%	50.10%	-3.92
Diabetes	36.50%	36.60%	-0.22	38.30%	38.20%	0.22	44.90%	42.00%	5.88
Previous MI	48.20%	49.60%	-2.81	52.90%	53.60%	-1.36	54.10%	58.60%	-9.01
Chronic Lung Disease	25.70%	24.90%	1.85	22.30%	21.40%	2.13	18.80%	20.40%	-3.96
Cerebrovascular Disease	14.30%	14.10%	0.49	13.90%	15.40%	-4.18	16.50%	17.60%	-2.98
Renal Failure-Dialysis	2.50%	2.80%	-1.89	2.40%	2.60%	-1.18	3.20%	3.20%	-0.13
Cardiac Arrest	2.40%	2.00%	2.81	2.10%	2.00%	0.76	1.50%	2.90%	-9.68
Hypertension	77.90%	77.10%	1.73	77.90%	78.70%	-2.02	80.50%	80.20%	0.81
Syncope	11.20%	9.80%	4.54	10.60%	10.70%	-0.24	13.20%	11.00%	6.68
CHF Duration									
No	9.7%	9.7%	-0.23	9.40%	10.20%	-2.64	8.50%	9.20%	-2.62

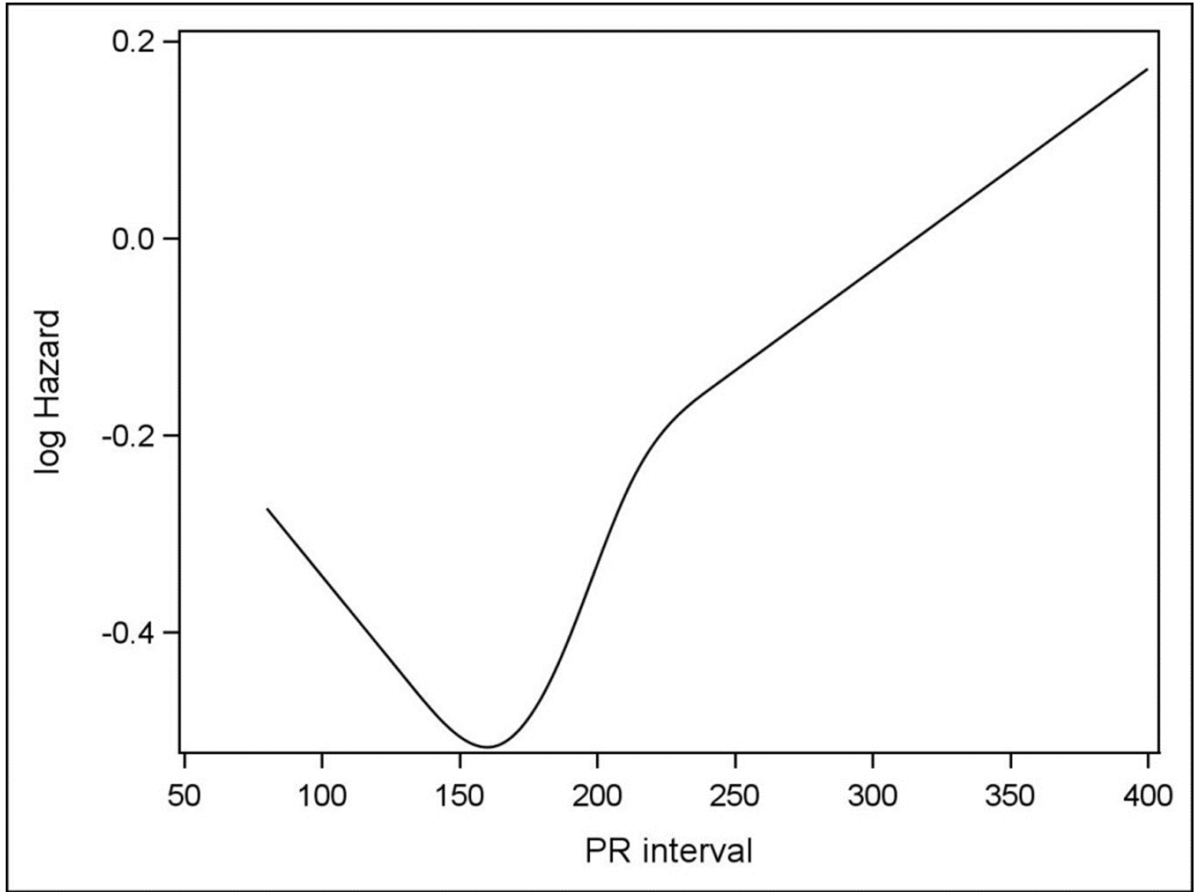
Less than 9 months	28.5%	27.7%	1.69	24.20%	24.00%	0.25	22.70%	22.70%	0.12
Greater than 9 months	61.9%	62.6%	-1.43	66.50%	65.80%	1.43	68.80%	68.10%	1.49
EF %	24.4	24.6	-3.69	24.5	24.8	-3.92	25.2	25.2	-1.04
GFR									
≥60	46.50%	45.00%	3.07	39.00%	40.30%	-2.7	36.50%	37.30%	-1.46
30-59	45.00%	46.40%	-2.93	50.60%	49.60%	1.95	52.20%	51.20%	2.03
15-29	5.80%	5.50%	1.44	7.60%	7.00%	2.42	8.00%	8.20%	-0.65
<15	2.70%	3.10%	-2.38	2.90%	3.10%	-1.65	3.30%	3.40%	-0.75
BUN Level									
≤ 20	46.40%	45.70%	1.38	39.40%	41.30%	-3.99	33.30%	34.20%	-1.84
20-40	43.90%	45.60%	-3.42	49.10%	48.50%	1.21	54.00%	52.00%	4.15
>40	9.70%	8.60%	3.51	11.60%	10.20%	4.35	12.70%	13.90%	-3.55
Sodium Level									
≤ 135	12.80%	12.40%	1.47	12.90%	12.70%	0.54	12.70%	13.10%	-1.17
135-145	85.60%	86.40%	-2.34	85.70%	85.90%	-0.64	85.60%	85.20%	0.94
>145	1.50%	1.20%	2.81	1.40%	1.40%	0.36	1.70%	1.70%	0.46
Systolic BP									
≤ 100	5.20%	5.20%	0.15	5.80%	5.50%	1.04	5.20%	5.10%	0.46
100-130	40.80%	42.10%	-2.68	42.30%	40.90%	2.86	37.40%	40.50%	-6.28
>130	54.00%	52.70%	2.58	51.90%	53.60%	-3.3	57.30%	54.40%	5.96
Angiotensin converting enzyme inhibitor	62.60%	62.40%	0.53	59.00%	59.30%	-0.49	59.20%	58.40%	1.76
Amiodarone	6.60%	6.20%	1.63	9.10%	9.50%	-1.5	15.40%	14.90%	1.53
Hydralazine	3.60%	3.70%	-0.33	3.80%	3.60%	0.97	4.00%	4.60%	-2.59
Angiotensin receptor blocker	18.10%	20.00%	-4.81	21.70%	21.60%	0.26	21.10%	22.40%	-3.22
Aspirin	70.80%	72.00%	-2.85	69.40%	72.80%	-7.7	70.50%	72.50%	-4.52
Beta-blocker	85.70%	86.70%	-3.04	86.80%	87.40%	-1.86	83.40%	84.80%	-3.63
Warfarin	14.80%	15.10%	-0.68	17.80%	17.60%	0.46	24.10%	23.60%	1.1
Digoxin	19.10%	20.10%	-2.42	23.80%	22.90%	2.08	23.60%	25.50%	-4.45
Diuretic	66.60%	67.00%	-0.73	67.80%	68.70%	-1.91	72.60%	72.20%	0.88
Long acting nitrate	12.40%	11.60%	2.35	11.10%	11.40%	-1.13	12.20%	13.40%	-3.42
Clopidogrel	24.20%	24.10%	0.1	24.80%	23.70%	2.74	22.20%	23.80%	-3.67
Statin	63.60%	66.00%	-5.13	67.80%	69.80%	-4.45	70.90%	70.40%	1
Dementia	2.20%	2.60%	-2.11	2.80%	3.20%	-2.33	2.80%	2.90%	-0.82
Disability/frailty	6.90%	6.30%	2.47	6.30%	6.20%	0.46	7.00%	7.10%	-0.16
EP operator ICD training									
Board-certified EP/EP fellowship	79.30%	78.10%	2.94	80.10%	79.10%	2.6	82.40%	80.70%	4.47
Surgery board	1.10%	1.20%	-0.44	1.30%	1.00%	2.53	1.00%	1.40%	-3.59
Other	19.60%	20.70%	-2.88	18.50%	19.90%	-3.35	16.60%	17.90%	-3.55
Operator CRT volume									
≤20 implants/year	57.20%	55.60%	3.21	56.20%	56.20%	-0.02	58.20%	55.40%	5.82
>20 implants/year	42.80%	44.40%	-3.21	43.80%	43.80%	0.02	41.80%	44.60%	-5.82
Region									
Other	2.50%	2.50%	-0.17	2.80%	2.50%	1.77	3.10%	2.90%	1.2
New England	4.30%	3.70%	2.92	4.50%	4.70%	-0.91	5.00%	4.20%	3.68
Atlantic	36.20%	33.60%	5.5	34.90%	33.50%	3.06	36.00%	32.10%	8.27
Central	45.40%	48.30%	-5.81	44.80%	46.80%	-3.91	44.20%	48.10%	-7.84
Mountain	4.40%	4.20%	0.81	4.60%	4.30%	1.73	3.80%	4.00%	-0.96
Pacific	7.20%	7.60%	-1.65	8.30%	8.30%	0.16	7.90%	8.70%	-2.92
Teaching status									
Council of teaching hospitals	28.20%	28.00%	0.56	28.50%	28.40%	0.05	30.10%	26.70%	7.46
Teaching hospital	29.10%	28.40%	1.46	26.50%	28.10%	-3.49	26.20%	28.80%	-5.96
Not teaching	42.70%	43.60%	-1.84	45.00%	43.50%	3.09	43.80%	44.50%	-1.42

hospital									
Center CRT volume									
≤20 implants/year	9.70%	10.00%	-1.17	10.20%	10.20%	-0.06	7.30%	7.90%	-2.31
>20 implants/year	90.30%	90.00%	1.17	89.80%	89.80%	0.06	92.70%	92.10%	2.31
Beds set up and staffed									
≤100	5.20%	5.70%	-2.09	4.90%	5.10%	-0.89	4.40%	5.90%	-6.6
100-500	60.10%	60.00%	0.04	61.60%	60.60%	2.12	64.80%	62.10%	5.6
>500	34.70%	34.20%	0.96	33.50%	34.30%	-1.77	30.80%	32.00%	-2.67
Implant year									
2006	18.0%	17.5%	1.25	18.20%	17.70%	1.08	19.80%	18.20%	4.11
2007	20.1%	19.3%	1.93	19.20%	18.70%	1.37	19.80%	21.80%	-4.73
2008	20.6%	22.4%	-4.6	20.00%	21.80%	-4.3	21.10%	21.10%	0.02
2009	21.8%	21.0%	1.83	22.20%	22.30%	-0.29	19.30%	21.10%	-4.57
2010	19.6%	19.7%	-0.26	20.40%	19.50%	2.3	20.00%	17.80%	5.45
<p>BUN = blood urea nitrogen, BP = blood pressure, CABG = coronary artery bypass grafting, CHF = congestive heart failure, EF = ejection fraction, GFR = glomerular filtration rate, LBBB = left bundle branch block, MI = myocardial infarction, NYHA = New York Heart Association, PCI = percutaneous coronary intervention</p>									

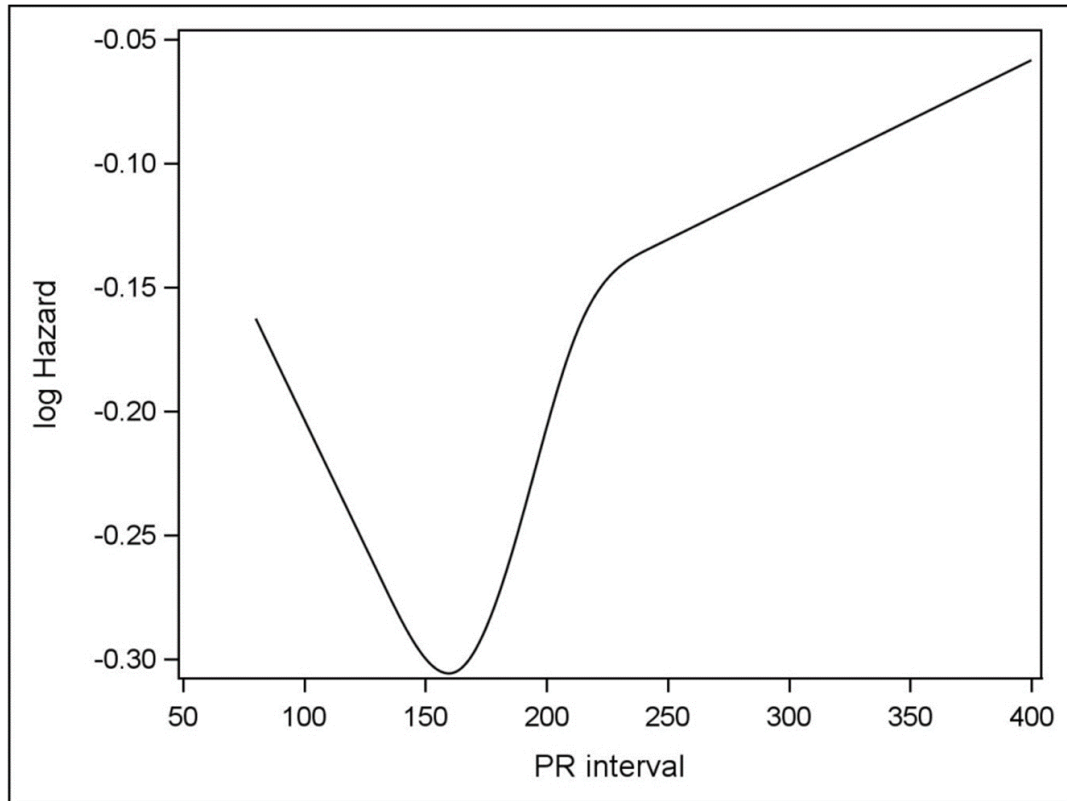




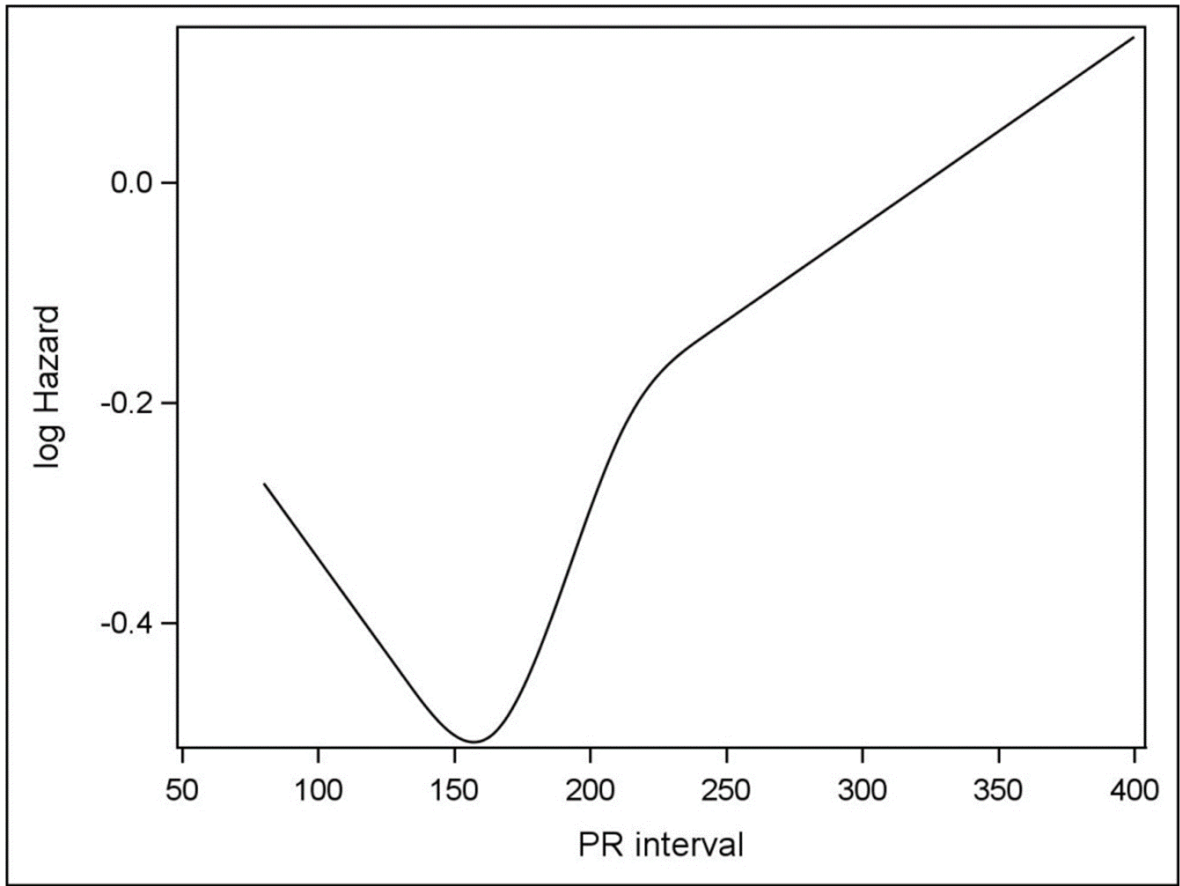
Supplemental Figure 1



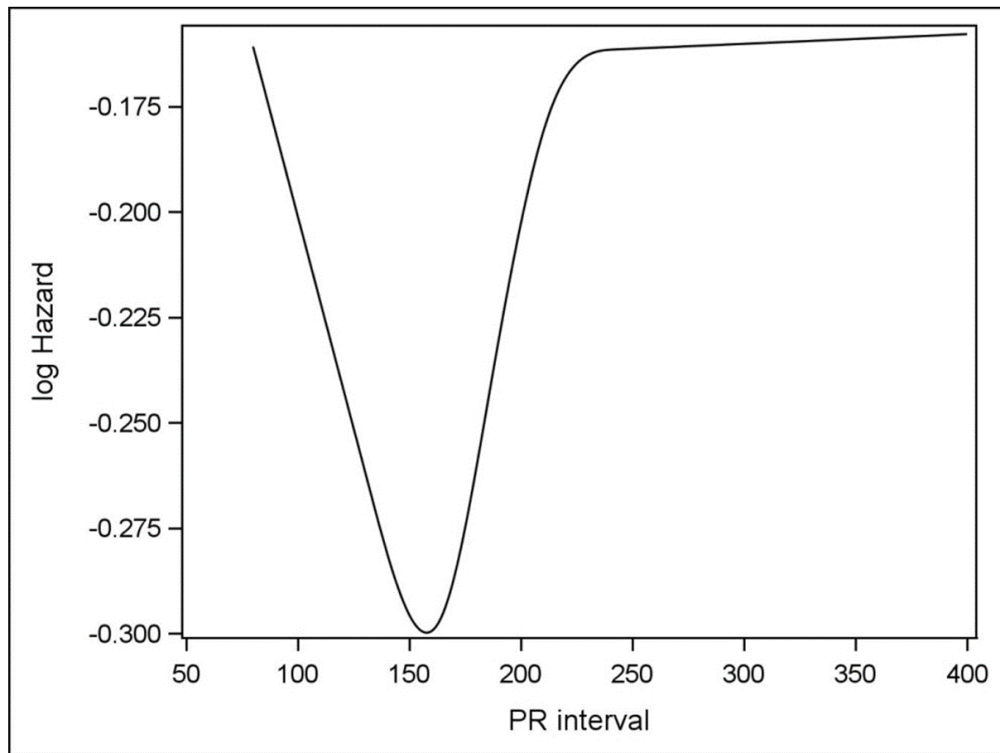
Supplemental Figure 2a



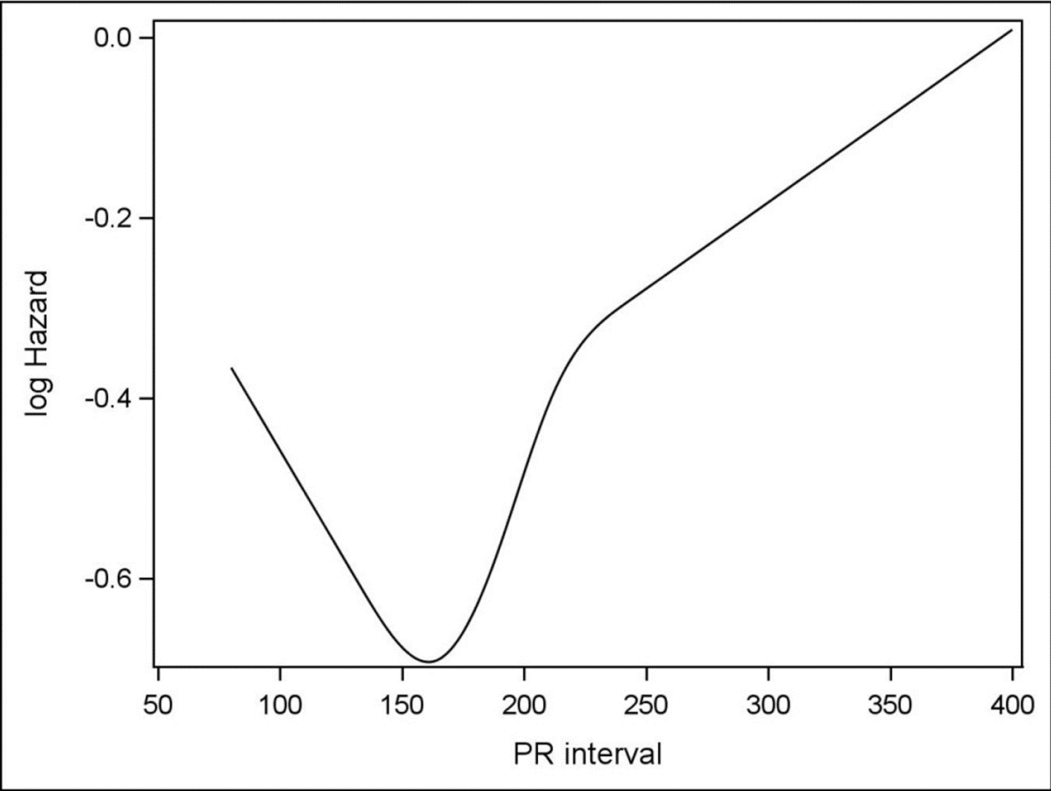
Supplemental Figure 2b



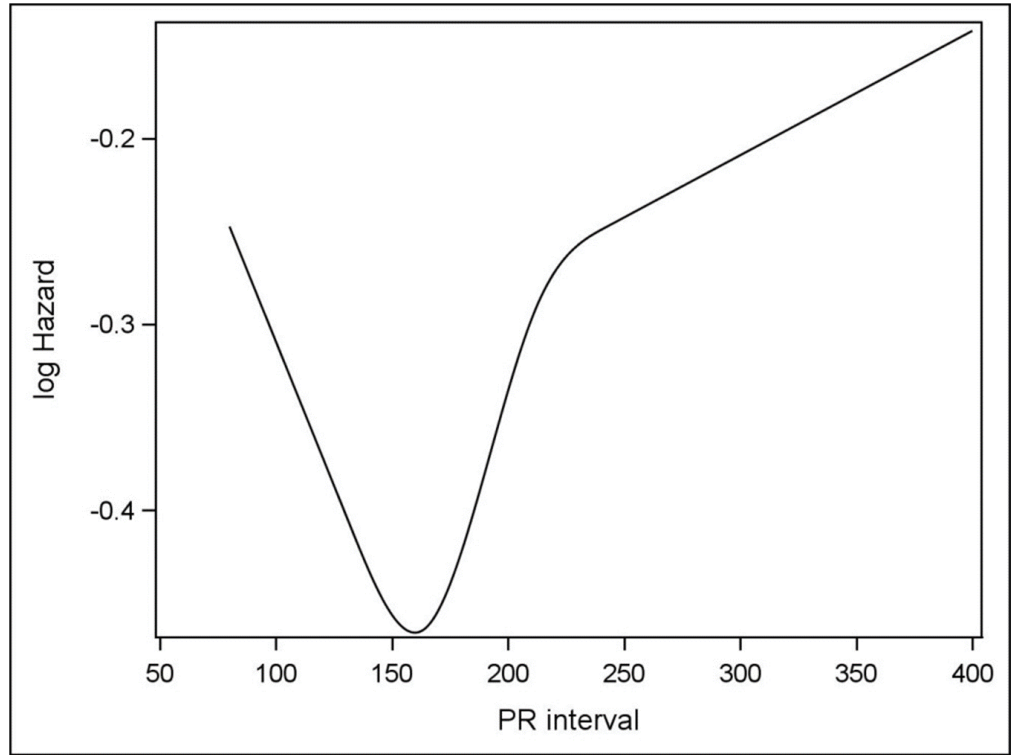
Supplemental Figure 2c



Supplemental Figure 2d



Supplemental Figure 2e



Supplemental Figure 2f