Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. List of HMT and Number of Patients Taking HMT

Drug	n (%)	Median % Adherence	Average Daily Dose	Median Time Between BCA Diagnosis and Start of Therapy (days)
Raloxifene Hydrochloride	1,972 (10.88)	86.86%	59.92	75
Tamoxifen Citrate	5,335 (29.43)	89.50%	19.96	188
Tamoxifen, other	0	n/a	n/a	n/a
Anastrozole	9,819 (54.17)	94.68%	1	125
Letrozole	4,663 (25.72)	92.92%	2.5	126
Fulvestrant	33 (0.18)	91.38%	18.07	1000
Exemestane	1,550 (8.55)	93.46%	25	465

eTable 2. List of Hormone Modulating Therapy Drug Codes Used

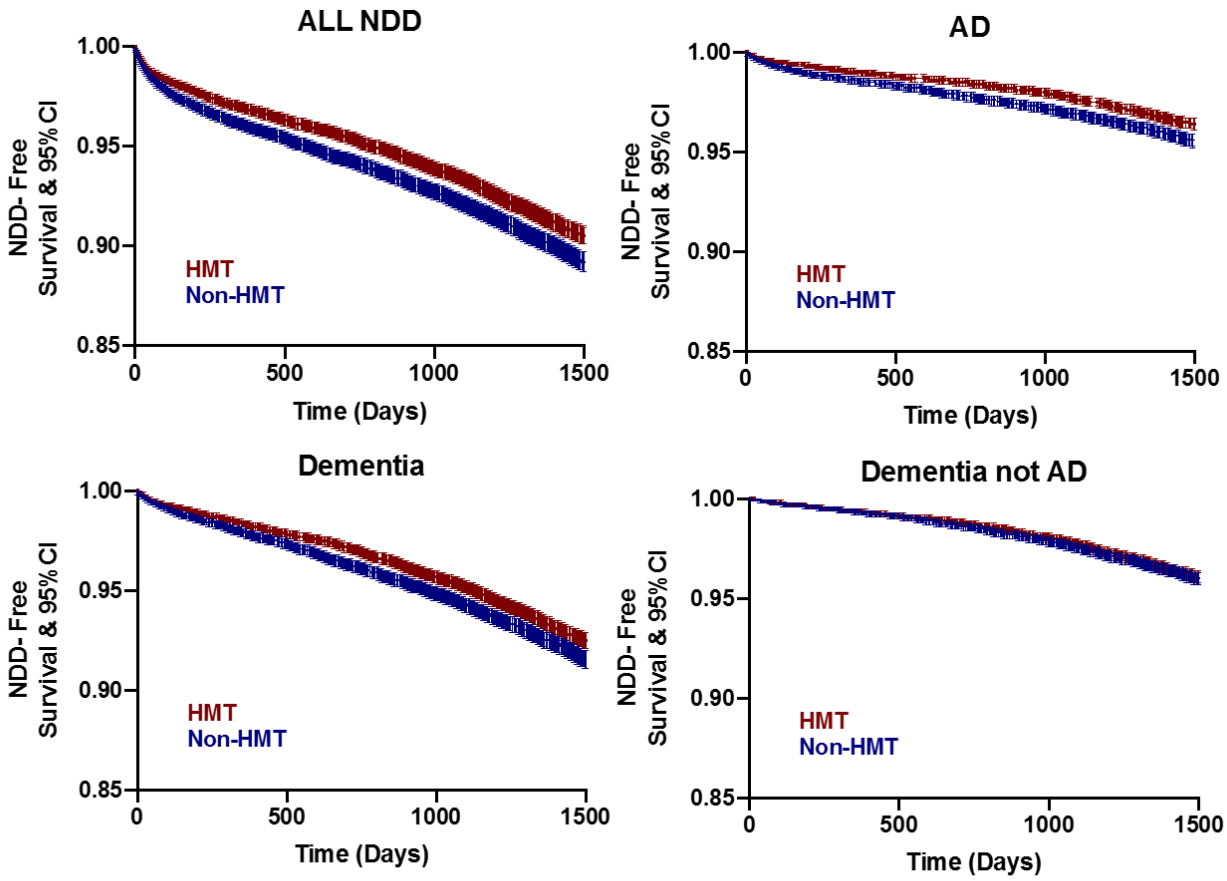
Drug	
Raloxifene Hydrochloride	GENERIC_DRUG-100578
Tamoxifen Citrate	GENERIC_DRUG-100858
Tamoxifen, other	GENERIC_DRUG-103413
Anastrozole	GENERIC_DRUG-101513
Letrozole	GENERIC_DRUG-104120
Fulvestrant	GENERIC_DRUG-105312
Exemestane	GENERIC_DRUG-105517

eTable 3. List of Chemotherapy Drug Codes Used

Drug	
Trastuzumab	GENERIC_DRUG-108717
Epirubicin	GENERIC_DRUG-102011
Fluorouracil	GENERIC_DRUG-101933, GENERIC_DRUG-104504, GENERIC_DRUG-104268
Paclitaxel	GENERIC_DRUG-100259
Vinblastine	GENERIC_DRUG-102905
Doxorubicin	GENERIC_DRUG-102078
Daunorubicin	GENERIC_DRUG-107513, GENERIC_DRUG-107300
Gemcitabine	GENERIC_DRUG-102442, GENERIC_DRUG-101042
Thiotepa	GENERIC_DRUG-110262
Capecitabine	GENERIC_DRUG-103321
Carboplatin	GENERIC_DRUG-104932
Cyclophosphamide	GENERIC_DRUG-100227
Methotrexate	GENERIC_DRUG-100152
Vincristine	GENERIC_DRUG-102853
Cisplatin	GENERIC_DRUG-104152

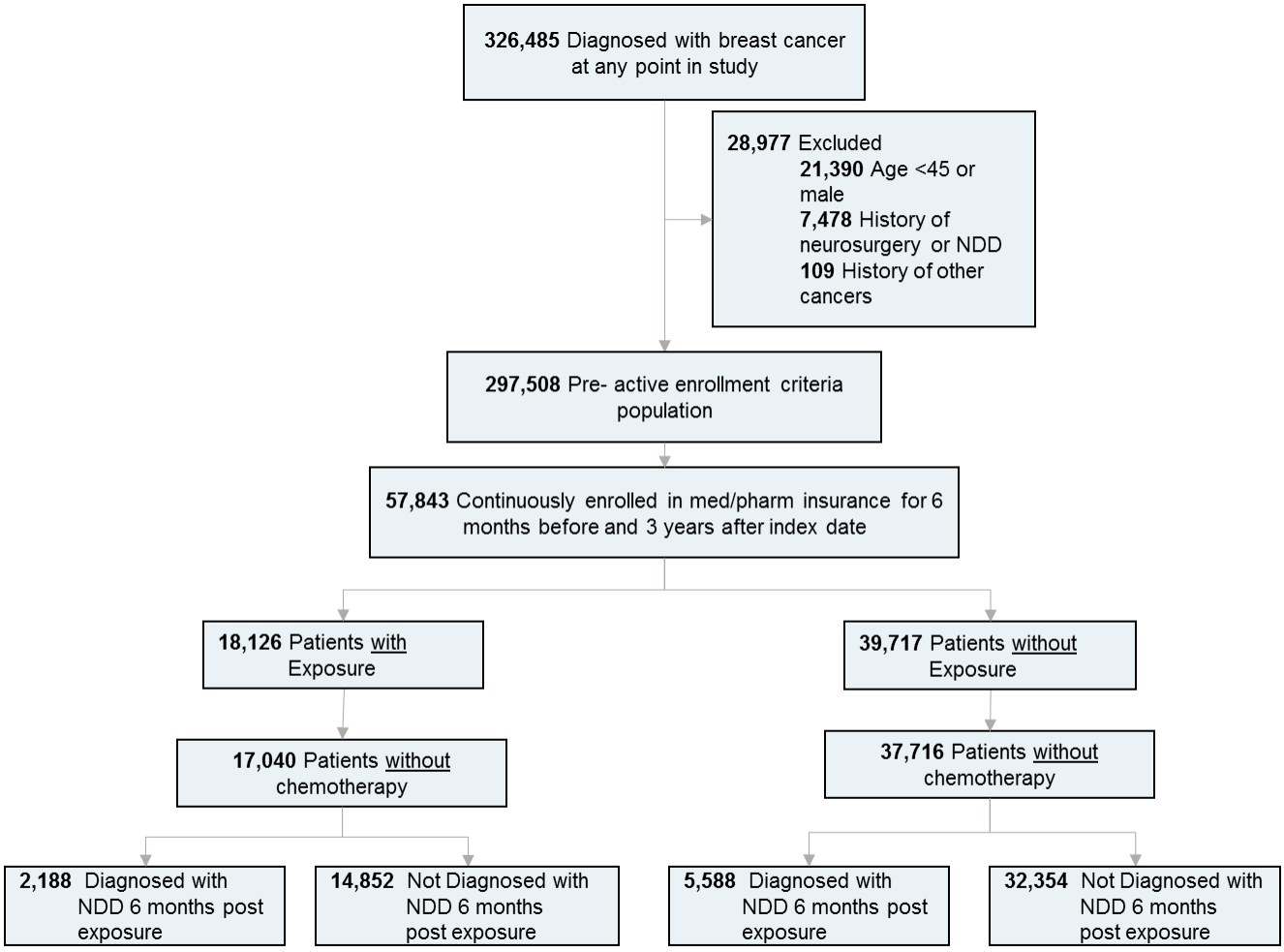
eTable 4. List of Diagnose Codes Used

Diagnosis	ICD-9	ICD-10
Breast Cancer	ICD-9-D-1740, ICD-9-D-1741, ICD-9-D-1742, ICD-9-D-1743, ICD-9-D-1744, ICD-9-D-1745, ICD-9-D-1746, ICD-9-D-1748, ICD-9-D-1749, ICD-9-D-1750, ICD-9-D-1759, ICD-9-D-19881, ICD-9-D-217, ICD-9-D-2330, ICD-9-D-2383, ICD-9-D-2393,	ICD-10-D-C4352, ICD-10-D-C44501, ICD-10-D-C44511, ICD-10-D-C44521, ICD-10-D-C44591, ICD-10-D-C4A52, ICD-10-D-C50011, ICD-10-D-C50012, ICD-10-D-C50019, ICD-10-D-C50021, ICD-10-D-C50022, ICD-10-D-C50029, ICD-10-D-C50111, ICD-10-D-C50112, ICD-10-D-C50119, ICD-10-D-C50121, ICD-10-D-C50122, ICD-10-D-C50129, ICD-10-D-C50211, ICD-10-D-C50212, ICD-10-D-C50219, ICD-10-D-C50221, ICD-10-D-C50222, ICD-10-D-C50311, ICD-10-D-C50312, ICD-10-D-C50319, ICD-10-D-C50321, ICD-10-D-C50322, ICD-10-D-C50329, ICD-10-D-C50411, ICD-10-D-C50412, ICD-10-D-C50419, ICD-10-D-C50421, ICD-10-D-C50422, ICD-10-D-C50429, ICD-10-D-C50511, ICD-10-D-C50512, ICD-10-D-C50519, ICD-10-D-C50521, ICD-10-D-C50522, ICD-10-D-C50611, ICD-10-D-C50612, ICD-10-D-C50619, ICD-10-D-C50621, ICD-10-D-C50622, ICD-10-D-C50811, ICD-10-D-C50812, ICD-10-D-C50819, ICD-10-D-C50821, ICD-10-D-C50822, ICD-10-D-C50829, ICD-10-D-C50911, ICD-10-D-C50912, ICD-10-D-C50919, ICD-10-D-C50921, ICD-10-D-C50922, ICD-10-D-C50929, ICD-10-D-C7981, ICD-10-D-D0352, ICD-10-D-D0500, ICD-10-D-D0501, ICD-10-D-D0502, ICD-10-D-D0510, ICD-10-D-D0511, ICD-10-D-D0512, ICD-10-D-D0580, ICD-10-D-D0581, ICD-10-D-D0582, ICD-10-D-D0590, ICD-10-D-D0591, ICD-10-D-D0592, ICD-10-D-D241, ICD-10-D-D242, ICD-10-D-D249, ICD-10-D-D4860, ICD-10-D-D4861, ICD-10-D-D4862, ICD-10-D-D493
NDD	See AD, Dementia, MS, Parkinson, and ALS Codes	
AD	ICD-9-D-3310	ICD-10-D-G300, ICD-10-D-G301, ICD-10-D-G308, ICD-10-D-G309
Dementia	ICD-9-D-2900, ICD-9-D-29010, ICD-9-D-29011, ICD-9-D-29012, ICD-9-D-29013, ICD-9-D-29020, ICD-9-D-29021, ICD-9-D-2903, ICD-9-D-29040, ICD-9-D-29041, ICD-9-D-29042, ICD-9-D-29043, ICD-9-D-29410, ICD-9-D-29411, ICD-9-D-29420, ICD-9-D-29421, ICD-9-D-33119, ICD-9-D-33182	ICD-10-D-F0150, ICD-10-D-F0151, ICD-10-D-F0280, ICD-10-D-F0281, ICD-10-D-F0390, ICD-10-D-F0391, ICD-10-D-G3109, ICD-10-D-G3183
MS	ICD-9-D-340	ICD-10-D-G35
Parkinson's	ICD-9-D-332, ICD-9-D-3320	ICD-10-D-G20, ICD-10-D-G214
ALS	ICD-9-D-33520	ICD-10-D-G1221
T2D	ICD-9-D-25000, ICD-9-D-25001, ICD-9-D-25002, ICD-9-D-25003	ICD-10-D-E108, ICD-10-D-E109, ICD-10-D-E1169, ICD-10-D-E118, ICD-10-D-E119
HTN	ICD-9-D-4010, ICD-9-D-4011, ICD-9-D-4019	ICD-10-D-I10, ICD-10-D-I110, ICD-10-D-I119
COPD	ICD-9-D-49120, ICD-9-D-49121, ICD-9-D-49122, ICD-9-D-49320, ICD-9-D-49321, ICD-9-D-49322	ICD-10-D-J440, ICD-10-D-J441, ICD-10-D-J449
CKD	ICD-9-D-5851, ICD-9-D-5852, ICD-9-D-5853, ICD-9-D-5854, ICD-9-D-5855, ICD-9-D-5859	ICD-10-D-N181, ICD-10-D-N182, ICD-10-D-N183, ICD-10-D-N184, ICD-10-D-N185, ICD-10-D-N189
CVD	ICD-9-D-4149, ICD-9-D-4280, ICD-9-D-4281, ICD-9-D-42820, ICD-9-D-42821, ICD-9-D-42822, ICD-9-D-42823, ICD-9-D-42830, ICD-9-D-42831, ICD-9-D-42832, ICD-9-42833, ICD-9-D-42840, ICD-9-D-42841, ICD-9-D-42842, ICD-9-D-42843, ICD-9-D-4289, ICD-9-D-4292	ICD-10-D-I25700,ICD-10-D-I25708, ICD-10-D-I25709, ICD-10-D-I25710, ICD-10-D-I25719, ICD-10-D-I25720, ICD-10-D-I25729, ICD-10-D-I25739, ICD-10-D-I25798, ICD-10-D-I25799, ICD-10-D-I25810, ICD-10-D-I25811, ICD-10-D-I2582, ICD-10-D-I2583, ICD-10-D-I2584, ICD-10-D-I2589, ICD-10-D-I259, ICD-10-D-I501, ICD-10-D-I5043, ICD-10-D-I509
Stroke	ICD-9-D-430, ICD-9-D-431, ICD-9-D-432, ICD-9-D-4320, ICD-9-D-4321, ICD-9-D-4329, ICD-9-D-43300, ICD-9-D-4331, ICD-9-D-43310, ICD-9-D-43311, ICD-9-D-43320, ICD-9-D-43321, ICD-9-D-43330, ICD-9-D-43331, ICD-9-D-43381, ICD-9-D-43390, ICD-9-D-43391, ICD-9-D-43400, ICD-9-D-43401, ICD-9-D-43410, ICD-9-D-43411, ICD-9-D-43490, ICD-9-D-43491	ICD-10-D-I6300, ICD-10-D-I63011, ICD-10-D-I63012, ICD-10-D-I63031, ICD-10-D-I63032, ICD-10-D-I6310, ICD-10-D-I63139, ICD-10-D-I63232, ICD-10-D-I63233, ICD-10-D-I63239, ICD-10-D-I63312, ICD-10-D-I6339, ICD-10-D-I6340, ICD-10-D-I63411, ICD-10-D-I63432, ICD-10-D-I6350, ICD-10-D-I63512, ICD-10-D-I63519, ICD-10-D-I63529, ICD-10-D-I6359, ICD-10-D-I638, ICD-10-D-I639



eFigure 1. Reduced risk of all NDD, AD and Dementia in propensity score matched patients with HMT exposure across all age groups.

Abbreviations: HMT, hormone modulating therapy; All NDD, All Neurodegenerative Disease Composite Group; AD, Alzheimer's Disease; Dem, dementia; Dem no AD, non-Alzheimer's type dementia



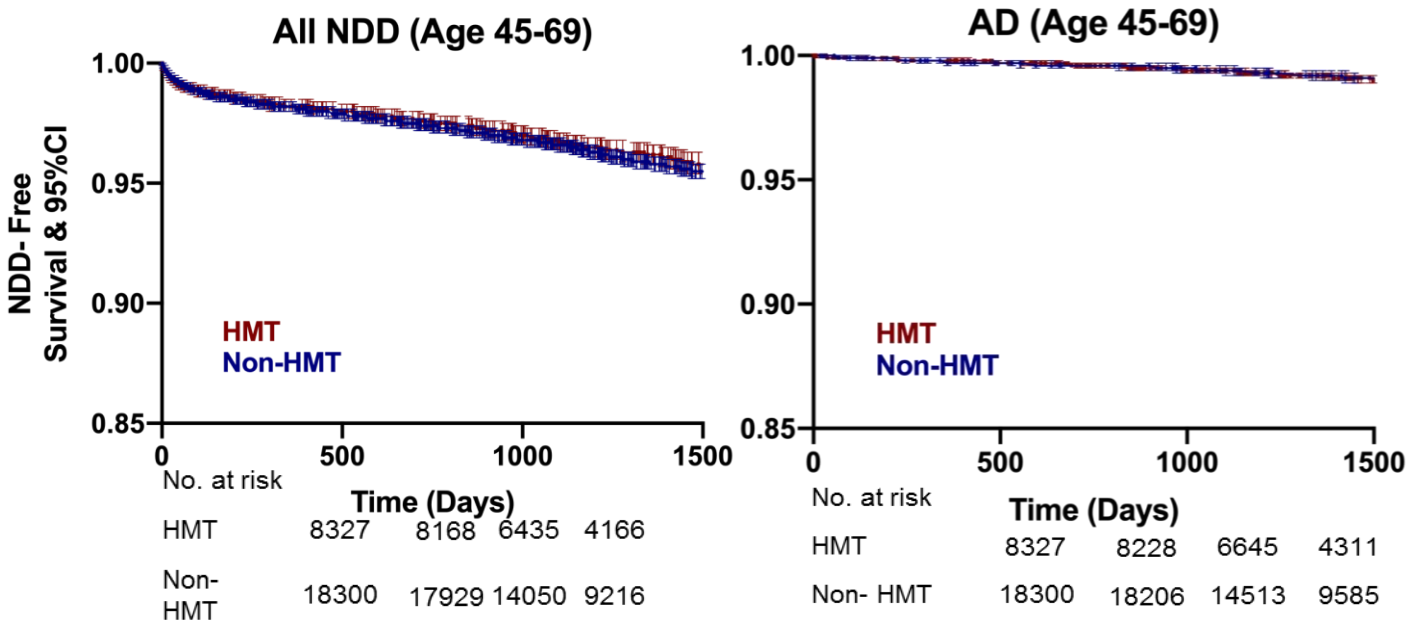
eFigure 2. Patient breakdown without chemotherapy

Abbreviations: DOI, drug of interest; NDD, neurodegenerative disease

	Unadjusted without Chemotherapy			
	Patients with HMT exposure			
	ALL NDD	**AD**	**Dem**	**Dem not AD**
# Patients	2,188	878	1,823	1,016
%	*12.84*	*5.15*	*10.70*	*5.96*
	Patients without HMT exposure			
# Patients	5,588	2,362	4,734	2,529
%	*14.82*	*6.62*	*12.55*	*6.71*
Relative Risk	0.87	0.82	0.85	0.89
95%CI	0.83 to 0.91	0.76 to 0.89	0.81 to 0.90	0.83 to 0.95
NNT	50.62	90.09	53.96	134.6
p-value	<0.001	<0.001	<0.001	0.001

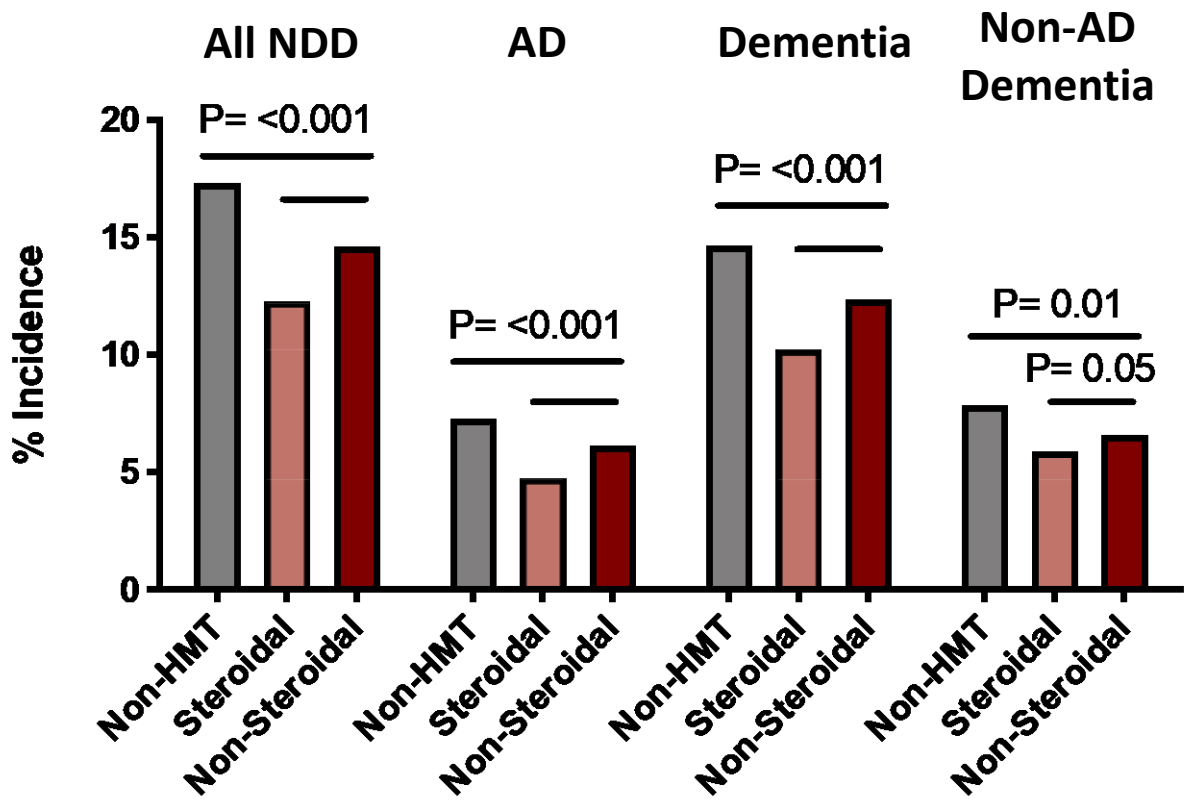
eTable 5. Relative risk of patients without chemotherapy taking HMT to develop NDDs

Abbreviation: HMT, hormone modulating therapy; AD, Alzheimer's Disease; Dem, dementia; Dem no AD, non-Alzheimer's type dementia



eFigure 3. Age-dependent reduction in risk for All NDD and Alzheimer's Disease is not associated with HMT exposure for patients less than 70 years of age.

Abbreviations: Non-HMT, Patients not exposed to hormone modulating therapy (HMT); HMT, Patients exposed to HMT



eFigure 4. Steroidal aromatase inhibitors are associated with the protective effects seen within the aromatase inhibitor group.

Abbreviations: Non-HMT, Patients not exposed to hormone modulating therapy (HMT); Steroidal, Steroidal Aromatase inhibitor (exemestane); Non-Steroidal, Non-steroidal aromatase inhibitors (anastrozole and letrozole)