

Supplemental Materials

Supplemental Table 1. Baseline socio-demographic and clinical characteristics of patients with sarcomas

Supplemental Table 2. Number and incidence rate of all-cause mortality of sarcoma patients overall and in subgroups

Supplemental Table 3. Distribution of death cause in patients with sarcoma

Supplemental Table 4. Cumulative prevalence of comorbid conditions at diagnosis, one year to five years after diagnosis

Supplemental Figure 1. CONSORT Diagram

Supplemental Figure 2. Trends in overall survival at 1-year to 10-year by year of sarcoma diagnosis

Supplemental Figure 3. Restricted cubic spline plots indicating non-linear relationships of NLR and PLR in relation to HR for death

Supplemental Figure 4. Kaplan-Meier curves of all-cause mortality and cancer-specific mortality in bone & articular cartilage and connective & soft-tissue sarcomas

Supplemental Figure 5. Kaplan-Meier curve of CCI in relation to all cause and cancer specific mortality for NLR and PLR

Supplemental Figure 6. Proposed implications on how identification of comorbidities in sarcoma patients may improve treatment outcomes

SUPPLEMENTAL TABLE 1. Baseline socio-demographic and clinical characteristics of patients with sarcomas

	Total (N=3358)	Sarcomas tumor site		
		Bone and articular cartilage (N=661)	Connective and other soft tissue (N=2576)	Both (N=121)
Socio-demographic variables				
Sex				
Female	1591 (47.4)	334 (50.5)	1192 (46.3)	65 (53.7)
Male	1767 (52.6)	327 (49.5)	1384 (53.7)	56 (46.3)
Age (mean ± SD), year				
<18, children and adolescent	254 (7.6)	116 (17.5)	122 (4.7)	16 (13.2)
18-<40, young adults	529 (15.8)	132 (20.0)	365 (14.2)	32 (26.4)
40-<65, adults	1418 (42.2)	232 (35.1)	1138 (44.2)	48 (39.7)
65-<80, young elderly	787 (23.4)	140 (21.2)	630 (24.5)	17 (14.0)
≥80, elderly	370 (11.0)	41 (6.2)	321 (12.5)	8 (6.6)
Clinical characteristics				
BMI (mean ± SD), kg/m ²	24.2 ± 4.0	24.2 ± 4.0	24.2 ± 3.9	24.7 ± 5.6
Weight (mean ± SD), kg	61.1 ± 13.0	60.1 ± 14.1	61.3 ± 12.5	58.3 ± 20.8
SBP (mean ± SD), mmHg	133.5 ± 19.2	133.1 ± 19.1	133.6 ± 19.3	135.3 ± 20.8
DBP (mean ± SD), mmHg	74.6 ± 11.3	74.6 ± 11.9	74.6 ± 11.1	75.6 ± 12.2
HbA1c (mean ± SD), %	6.6 ± 1.3	6.4 ± 1.1	6.6 ± 1.3	6.6 ± 1.2
CCI (mean ± SD)				
CCI				
2	688 (20.5)	231 (34.9)	420 (16.3)	37 (30.6)
3	470 (14.0)	84 (12.7)	357 (13.9)	29 (24.0)
4	569 (16.9)	97 (14.7)	461 (17.9)	11 (9.1)
5	488 (14.5)	80 (12.1)	396 (15.4)	12 (9.9)
6	564 (16.8)	89 (13.5)	456 (17.7)	19 (15.7)
≥7	579 (17.2)	80 (12.1)	486 (18.9)	13 (10.7)
Serum LDH (mean ± SD), U/L				
<106 (for men); <103 (for women)	11 (0.7)	1 (0.3)	10 (0.9)	0 (0)

106-218 (for men); 103-199 (for women)	685 (43.7)	162 (44.9)	492 (43.4)	31 (42.5)
>218 (for men); >199 (for women)	872 (55.6)	198 (54.8)	632 (55.7)	42 (57.5)
Absolute Neutrophil count (mean \pm SD), $\times 10^9/L$	6.1 \pm 5.2	5.9 \pm 3.7	6.2 \pm 5.6	5.8 \pm 2.6
<1.6	57 (1.9)	14 (2.3)	41 (1.8)	2 (1.8)
1.6-7.0	2221 (73.5)	452 (73.6)	1687 (73.6)	82 (71.9)
>7.0	742 (24.6)	148 (24.1)	564 (24.6)	30 (26.3)
Absolute Lymphocyte count (mean \pm SD), $\times 10^9/L$	1.6 \pm 1.1	1.6 \pm 0.8	1.6 \pm 1.1	1.6 \pm 0.7
<1.1	874 (28.9)	174 (28.3)	672 (29.3)	28 (24.6)
1.1-2.9	1980 (65.6)	403 (65.6)	1494 (65.2)	83 (72.8)
>2.9	166 (5.5)	37 (6.0)	126 (5.5)	3 (2.6)
Platelet count (mean \pm SD), $\times 10^9/L$	281.2 \pm 116.6	281.8 \pm 107.8	280.6 \pm 119.6	290.5 \pm 99.3
<150	206 (6.3)	39 (6.0)	163 (6.5)	4 (3.3)
150-384	2626 (79.8)	527 (80.6)	2000 (79.6)	99 (81.8)
>384	457 (13.9)	88 (13.5)	351 (14.0)	18 (14.9)
NLR (mean \pm SD)	5.7 \pm 8.3	5.6 \pm 6.4	5.8 \pm 8.9	4.5 \pm 3.3
<2.5	1031 (34.1)	204 (33.2)	793 (34.6)	34 (29.8)
≥ 2.5	1989 (65.9)	410 (66.8)	1499 (65.4)	80 (70.2)
PLR (mean \pm SD)	246.4 \pm 246.3	240.7 \pm 205.1	248.8 \pm 257.9	228.8 \pm 208.3
<182	1582 (52.4)	326 (53.1)	1197 (52.2)	59 (51.8)
≥ 182	1438 (47.6)	288 (46.9)	1095 (47.8)	55 (48.2)

Note: SBP = systolic blood pressure; DBP = diastolic blood pressure; HbA1c = glycated haemoglobin; CCI = Charlson Comorbidity Index; LDH = lactate dehydrogenase; NLR = neutrophil-lymphocyte ratio PLR = platelet-lymphocyte ratio

SUPPLEMENTAL TABLE 2. Number and incidence rate of all-cause mortality of sarcoma patients overall and in subgroups

Event	Cumulative incidence		Incidence rate (Cases/ 100 person-years)		Median follow-up periods (Months)
	Cases	Rate	Estimate	95% CI	
Overall (N=3358)	1754	0.522	14.50	(13.83, 15.19)	26
Sex					
Male	969	0.548	15.72	(14.74, 16.74)	25
Female	785	0.493	13.23	(12.32, 14.19)	29
Age group					
<18, children and adolescent	73	0.287	5.90	(4.62, 7.41)	46.5
18-<40, young adults	183	0.346	7.45	(6.41, 8.61)	40
40-<65, adults	659	0.465	11.70	(10.82, 12.63)	34
65-<80, young elderly	530	0.673	24.18	(22.16, 26.33)	16
≥80, elderly	309	0.835	53.37	(47.58, 59.66)	6
Sarcoma tumor site					
Bone and articular cartilage	320	0.484	12.54	(11.21, 14.00)	31
Connective and other soft tissue	1356	0.526	14.87	(14.08, 15.68)	25
NLR					
<2.5	357	0.346	7.31	(6.57, 8.11)	44
≥2.5	1306	0.657	23.97	(22.69, 25.30)	16
PLR					
<182	673	0.425	10.11	(9.36, 10.91)	36.5
≥182	990	0.688	26.90	(25.25, 28.63)	14
Serum LDH, U/L					
106-218 (for men); 103-199 (for women)	423	0.618	19.65	(17.82, 21.61)	22
<106 or >218 (for men); <103 or >199 (for women)	623	0.706	27.66	(25.53, 29.93)	12

Note: LDH = lactate dehydrogenase; NLR = neutrophil-lymphocyte ratio PLR = platelet-lymphocyte ratio

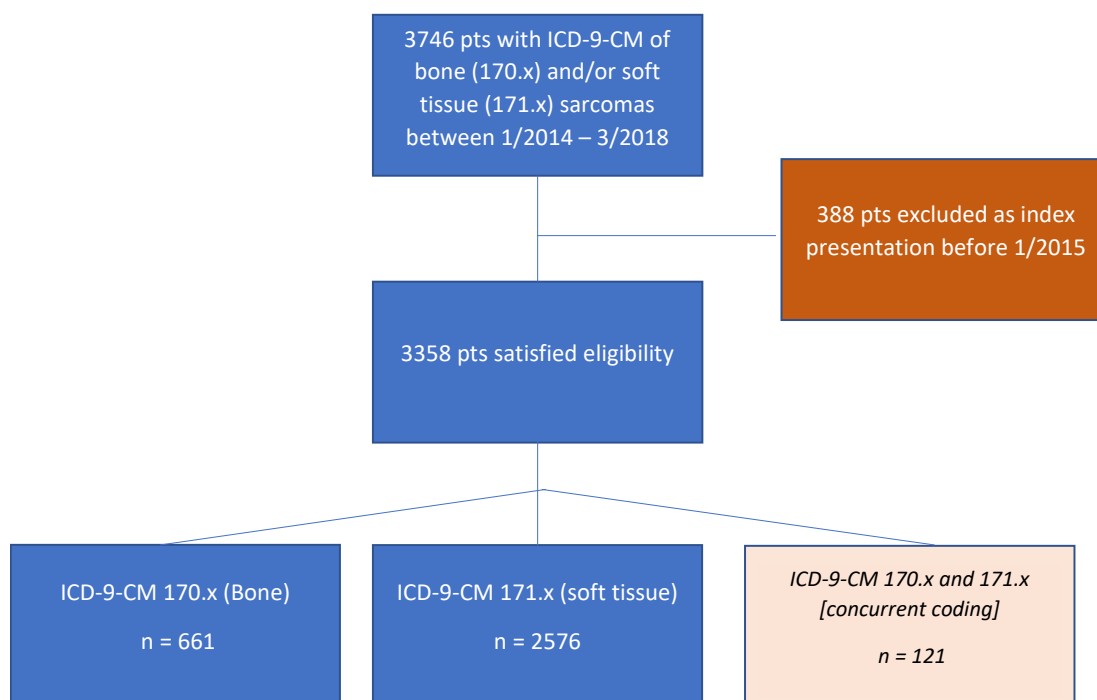
SUPPLEMENTAL TABLE 3. Distribution of death cause in patients with sarcoma

Primary Death cause by ICD-10	Total (N=1754)	Sarcomas tumor site		
		Bone and articular cartilage (N=320)	Connective and other soft tissue (N=1356)	Both (N=78)
I Certain infectious and parasitic diseases	25 (1.43)	5 (1.56)	17 (1.25)	3 (3.85)
II Neoplasms	1259 (71.78)	227 (70.94)	975 (71.90)	57 (73.08)
Sarcoma	400 (22.81)	93 (29.06)	280 (20.65)	27 (34.62)
bone and articular cartilage	127 (7.24)	87 (27.19)	23 (1.70)	17 (21.79)
other connective and soft tissue	273 (15.56)	6 (1.88)	257 (18.95)	10 (12.82)
Lung cancer	101 (5.76)	25 (7.81)	73 (5.38)	3 (3.85)
Liver cancer	23 (1.31)	7 (2.19)	15 (1.11)	1 (1.28)
Mesothelioma	113 (6.44)	0 (0)	113 (8.33)	0 (0)
Nasopharynx	31 (1.77)	5 (1.56)	26 (1.92)	0 (0)
Uterus	32 (1.82)	1 (0.31)	31 (2.29)	0 (0)
III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	2 (0.11)	1 (0.31)	1 (0.07)	0 (0)
IV Endocrine, nutritional and metabolic diseases	0 (0)	0 (0)	0 (0)	0 (0)
V Mental and behavioural disorders	0 (0)	0 (0)	0 (0)	0 (0)
VI Diseases of the nervous system	1 (0.06)	0 (0)	1 (0.07)	0 (0)
VII Diseases of the eye and adnexa	0 (0)	0 (0)	0 (0)	0 (0)
VIII Diseases of the ear and mastoid process	0 (0)	0 (0)	0 (0)	0 (0)
IX Diseases of the circulatory system	52 (2.96)	11 (3.44)	40 (2.95)	1 (1.28)
X Diseases of the respiratory system	196 (11.17)	28 (8.75)	159 (11.73)	9 (11.54)
Pneumonia-related mortality	143 (8.15)	21 (6.56)	116 (8.55)	6 (7.69)
XI Diseases of the digestive system	21 (1.20)	2(0.63)	19 (1.40)	0 (0)
XII Diseases of the skin and subcutaneous tissue	1 (0.06)	0 (0)	1 (0.07)	0 (0)
XIII Diseases of the musculoskeletal system and connective tissue	3 (0.17)	1 (0.31)	2 (0.15)	0 (0)
XIV Diseases of the genitourinary system	14 (0.80)	2 (0.63)	11 (0.81)	1 (1.28)
XV Pregnancy, childbirth and the puerperium	1 (0.06)	0 (0)	1 (0.07)	0 (0)
XVI Certain conditions originating in the perinatal period	1 (0.06)	1 (0.31)	0 (0)	0 (0)
XVII Congenital malformations, deformations and chromosomal abnormalities	0 (0)	0 (0)	0 (0)	0 (0)

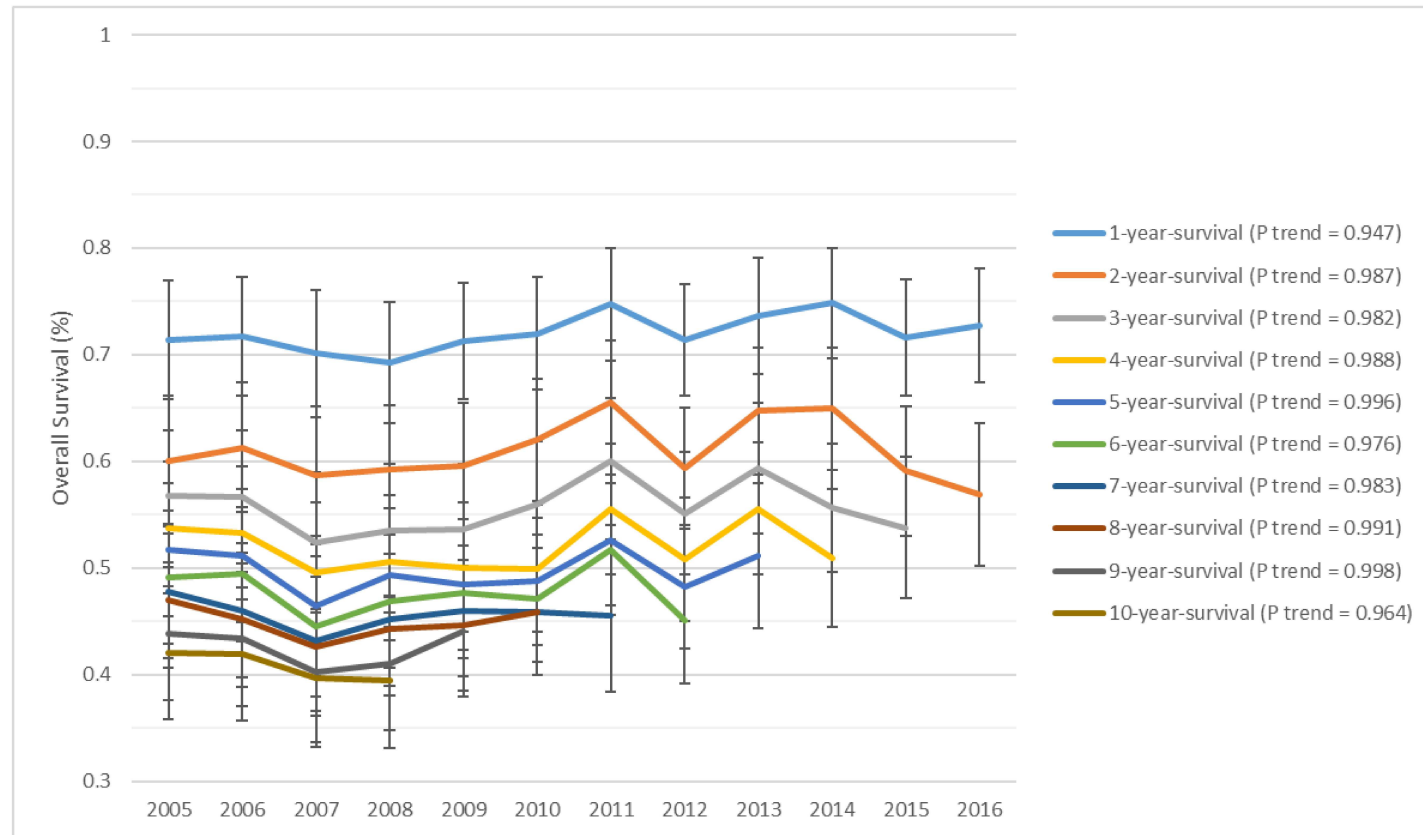
XVIII Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	8 (0.46)	3 (0.94)	5 (0.37)	0 (0)
XIX Injury, poisoning and certain other consequences of external causes	11 (0.63)	5 (1.56)	6 (0.44)	0 (0)
XX External causes of morbidity and mortality	0 (0)	0 (0)	0 (0)	0 (0)
XXI Factors influencing health status and contact with health services	0 (0)	0 (0)	0 (0)	0 (0)
XXII Codes for special purposes	0 (0)	0 (0)	0 (0)	0 (0)
Uncoded	159 (9.06)	34 (10.63)	118 (8.70)	7 (8.97)

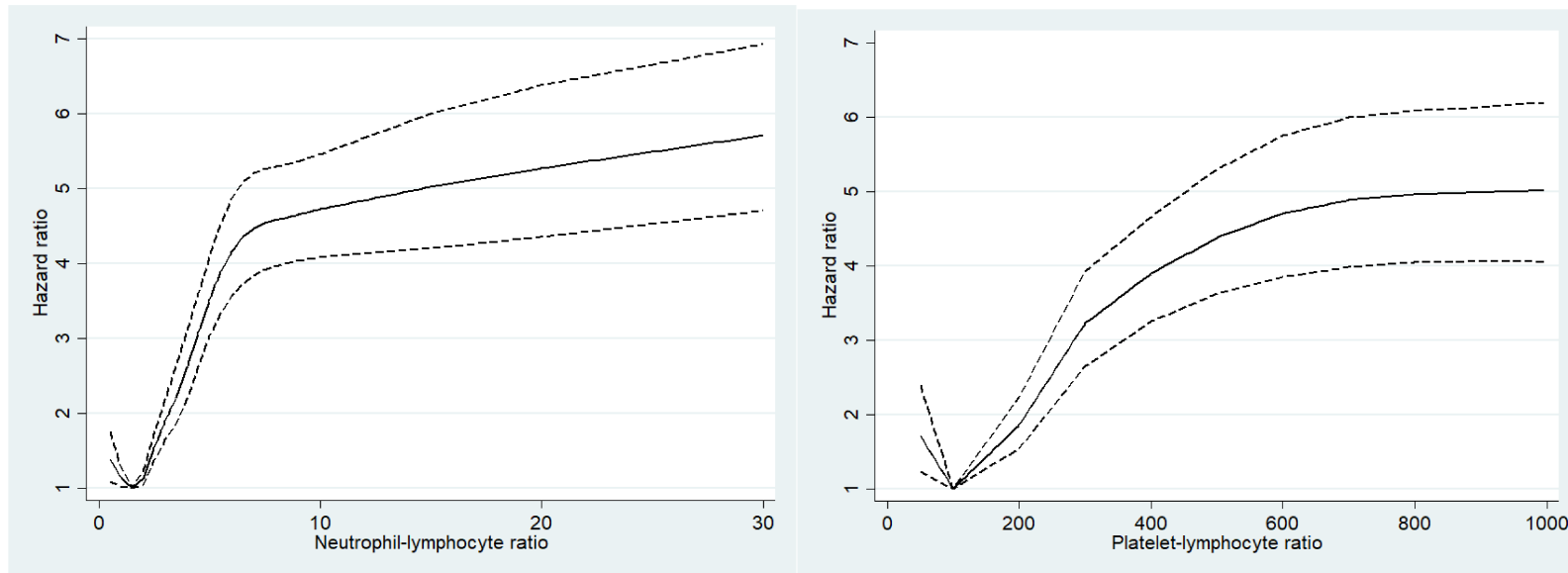
Supplemental Table 4. Cumulative prevalence of comorbid conditions at diagnosis, one year to five years after diagnosis

	Cumulative prevalence rate, N (%)					
	Diagnosis	1-year	2-year	3-year	4-year	5-year
Myocardial infarction	36 (1.1)	48 (1.4)	53 (1.6)	55 (1.6)	58 (1.7)	58 (1.7)
Other chronic ischemic heart disease	127 (3.8)	145 (4.3)	150 (4.5)	156 (4.6)	163 (4.9)	167 (5.0)
Congestive heart failure	88 (2.6)	113 (3.4)	121 (3.6)	126 (3.8)	133 (4.0)	136 (4.1)
Atrial fibrillation	74 (2.2)	99 (2.9)	107 (3.2)	115 (3.4)	120 (3.6)	122 (3.6)
Peripheral vascular disease	7 (0.2)	16 (0.5)	21 (0.6)	21 (0.6)	23 (0.7)	24 (0.7)
Cerebrovascular disease	161 (4.8)	193 (5.7)	208 (6.2)	223 (6.6)	234 (7.0)	237 (7.1)
Amputation	5 (0.1)	13 (0.4)	15 (0.4)	15 (0.4)	16 (0.5)	16 (0.5)
Dementia	23 (0.7)	28 (0.8)	29 (0.9)	30 (0.9)	34 (1.0)	35 (1.0)
Chronic lung disease	99 (2.9)	109 (3.2)	121 (3.6)	128 (3.8)	132 (3.9)	135 (4.0)
Musculoskeletal and chronic Orthopaedic disorders	1111 (33.1)	1212 (36.1)	1264 (37.6)	1301 (38.7)	1323 (39.4)	1335 (39.8)
Peptic ulcer disease	79 (2.4)	94 (2.8)	101 (3.0)	105 (3.1)	107 (3.2)	110 (3.3)
Diabetes mellitus	329 (9.8)	368 (11.0)	389 (11.6)	403 (12.0)	412 (12.3)	421 (12.5)
Moderate to severe chronic kidney disease	40 (1.2)	54 (1.6)	63 (1.9)	69 (2.1)	74 (2.2)	76 (2.3)
Hemiplegia	19 (0.6)	26 (0.8)	27 (0.8)	28 (0.8)	33 (1.0)	33 (1.0)
Leukemia	13 (0.4)	16 (0.5)	17 (0.5)	18 (0.5)	20 (0.6)	20 (0.6)
Malignant lymphoma	12 (0.4)	21 (0.6)	21 (0.6)	21 (0.6)	21 (0.6)	21 (0.6)
Liver disease	82 (2.4)	131 (3.9)	143 (4.3)	158 (4.7)	162 (4.8)	162 (4.8)

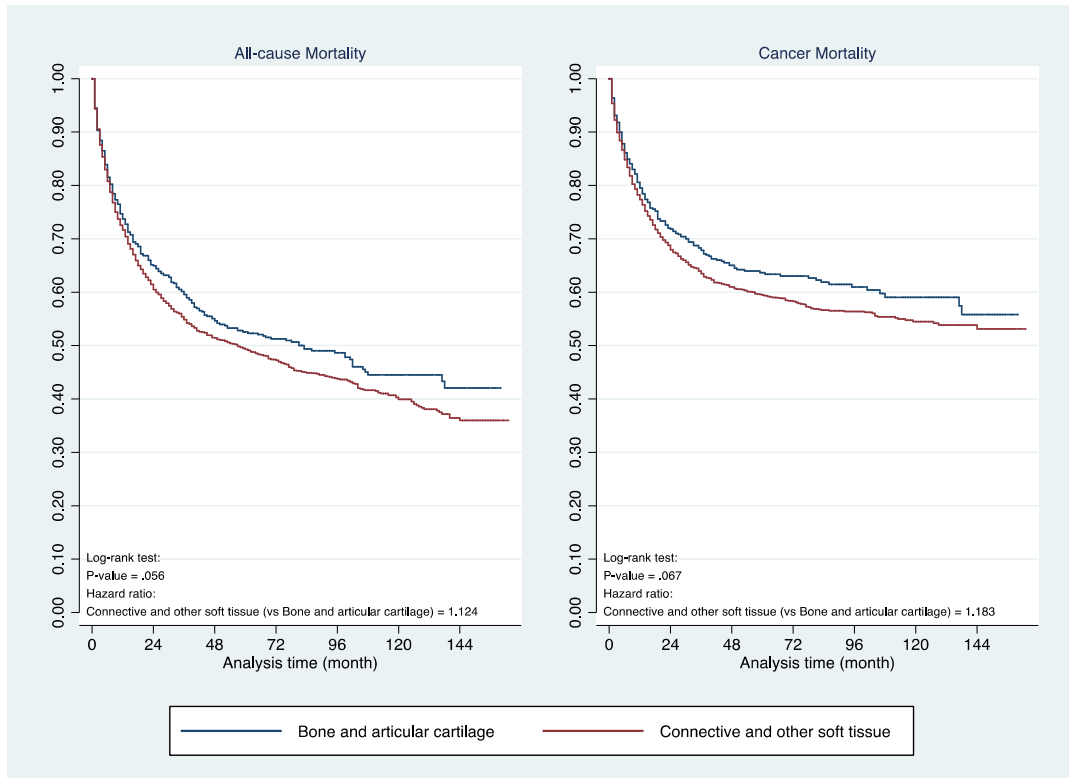
Supplemental Figure 1. CONSORT Diagram

Supplemental Figure 2. Trends in overall survival at 1-year to 10-year by year of sarcoma diagnosis

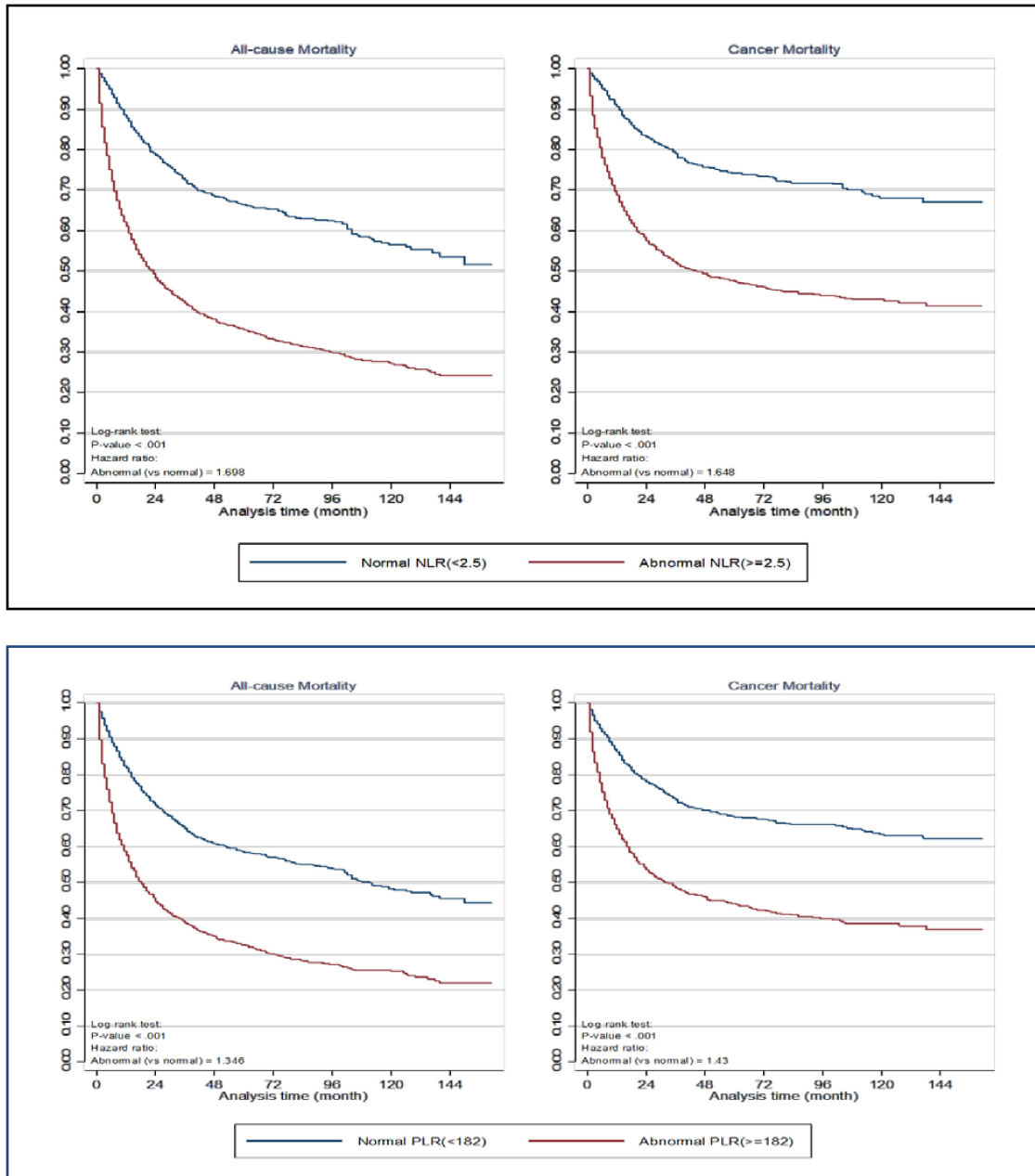


Supplemental Figure 3. Restricted cubic spine plots indicating non-linear relationships of NLR and PLR in relation to HR for death

Supplemental Figure 4. Kaplan-Meier curves of all-cause mortality and cancer-specific mortality in bone & articular cartilage and connective & soft-tissue sarcomas



Supplemental Figure 5. Kaplan-Meier curve of CCI in relation to all cause and cancer specific mortality for NLR and PLR



Supplemental Figure 6. Proposed implications on how identification of comorbidities in sarcoma patients may improve treatment outcomes

