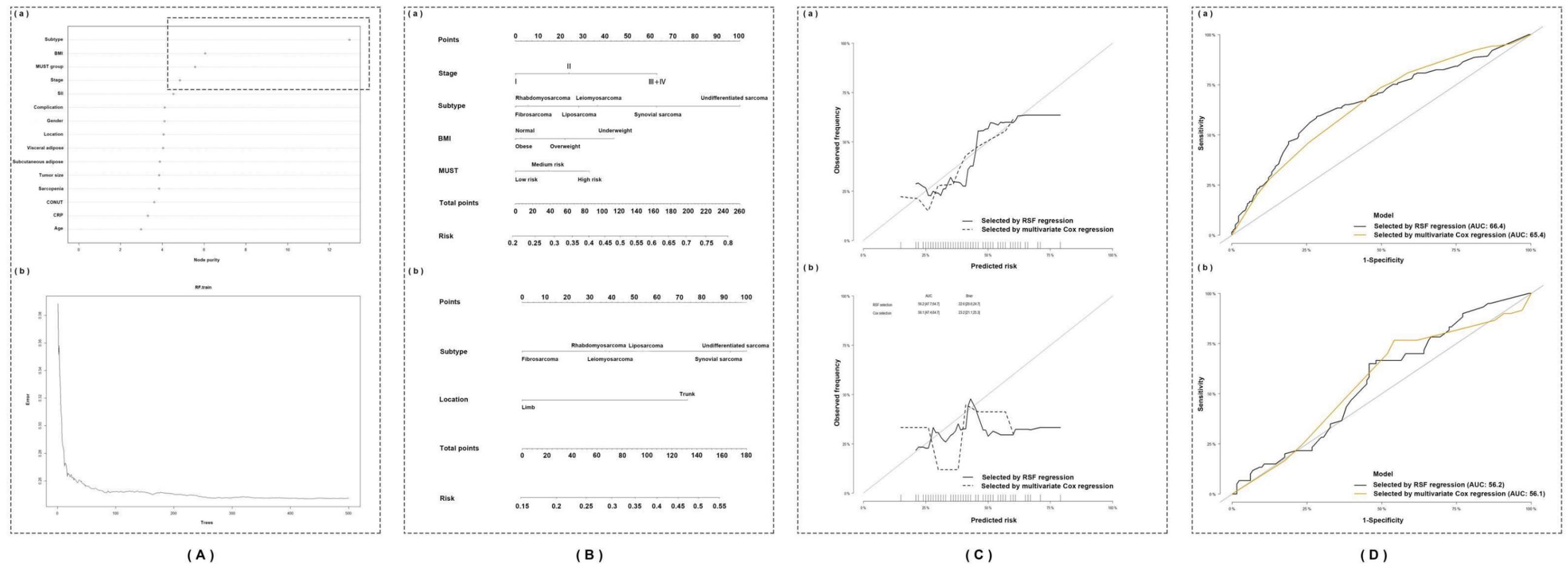**Supplementary Figure 1: The flow chart on PFS for patients with soft-tissue sarcomas receiving surgical resection.** (A) (a) Variable ranking with minimal depth method of RSF analysis on PFS in the training cohort. The variables in the dashed box were identified as important for PFS prediction. The dashed vertical line was the optimistic threshold using the mean of the minimal depth distribution which classified variables with minimal depth lower than this threshold as important in prediction of outcomes. (b) Random forest predicted survival for each patient in the training cohort on PFS. The lines with dark grey corresponded to censored individuals, and light grey curves corresponded to individuals occurring death events. (B) (a) Nomogram on PFS constructed by important variables from RSF analysis for patients with soft-tissue sarcomas receiving surgical resection to predict 3- and 5-year survival probabilities. (b) Nomogram on PFS constructed by significant variables from multivariate Cox analysis for patients with soft-tissue sarcomas receiving surgical resection to predict 3- and 5-year survival probabilities. (C) Calibration curves for the nomogram presenting agreement between predicted and observational survival probabilities of PFS for patients with soft-tissue sarcomas receiving surgical resection. The gray line of y=x represents a perfect predictive power by an ideal model. The fit goodness with this diagonal line coincided with the model's predictive performance. (a) Calibration plot for comparison between nomogram predicted 3-year survival rates and actual observation for PFS in the training cohort. (b) Calibration plot for comparison between nomogram predicted 5-year survival rates and actual observation for PFS in the training cohort. (c) Calibration plot for comparison between nomogram predicted 3-year survival rates and actual observation for PFS in the testing cohort. (d) Calibration plot for comparison between nomogram predicted 5-year survival rates and actual observation for PFS in the testing cohort. (D) (a) Time-dependent AUCs for predictive models on PFS for the training cohort. (b) Time-dependent AUCs for predictive models on PFS for the testing cohort.

Supplementary Figure 2 The flow chart on hospital duration for patients with soft-tissue sarcomas receiving surgical resection.(A) (a) Variable ranking with random forest analysis on hospital duration in the training cohort. The variables in the dashed box were identified as important for outcome prediction. (b) Predicted errors by the number of trees on hospital duration. There was significant improvement in predictive errors before 100 trees were built in this model. (B) (a) Nomogram on hospital duration constructed by important variables from random forest analysis for patients with soft-tissue sarcomas receiving surgical resection to predict risks. (b) Nomogram on hospital duration constructed by significant variables from multivariate binary logistic analysis for patients with soft-tissue sarcomas receiving surgical resection to predict risks. (C) Calibration curves for the nomogram presenting agreement between predicted and observational risks of hospital duration for patients with soft-tissue sarcomas receiving surgical resection. The gray line of y=x represents a perfect predictive power by an ideal model. The fit goodness with this diagonal line coincided with the model's predictive performance. (a) Calibration plot for comparison between nomogram predicted risks and actual observations for hospital duration in the training cohort. (b) Calibration plot for comparison between nomogram predicted risks and actual observations for hospital duration in the testing cohort. (D) (a) ROC analysis on hospital duration for the nomogram integrated models in the training set of patients with soft-tissue sarcomas receiving surgical resection. (b) ROC analysis on hospital duration for the nomogram integrated models in the testing set of patients with soft-tissue sarcomas receiving surgical resection.

Supplementary Table 1 The results of univariate and multivariate Cox regression analysis for patients with soft-tissue sarcomas receiving surgical resection between clinical characteristics and nutritional assessment tools, and PFS or OS*

Variable	PFS (month)				OS (month)			
	Univariate analysis		Multivariate analysis		Univariate analysis		Multivariate analysis	
	Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Age, years old								
<65	Reference				Reference			
≥65	1.204 (0.849-1.709)	0.297			1.119 (0.818-1.531)	0.481		
Gender								
Male	Reference				Reference			
Female	0.932 (0.708-1.228)	0.618			1.017 (0.818-1.265)	0.879		
Location of primary tumor								
Trunk	Reference				Reference			
Limb	0.870 (0.662-1.215)	0.413			1.216 (0.947-1.561)	0.126		
Subtype								
Liposarcoma	Reference	<0.001	Reference	0.001	Reference	0.060	Reference	0.016
Rhabdomyosarcoma	0.813 (0.489-1.352)	0.425	0.784 (0.467-1.314)	0.355	1.671 (1.120-2.495)	0.012	1.641 (1.092-2.465)	0.017
Synovial sarcoma	0.872 (0.520-1.462)	0.603	0.894 (0.529-1.511)	0.675	1.267 (0.825-1.947)	0.280	1.196 (0.773-1.850)	0.423
Undifferentiated sarcoma	1.550 (1.024-2.347)	0.038	1.513 (0.964-2.374)	0.072	1.613 (1.096-2.375)	0.015	1.704 (1.137-2.552)	0.010
Leiomyosarcoma	1.179 (0.776-1.792)	0.441	1.243 (0.803-1.924)	0.330	1.048 (0.720-1.527)	0.806	0.990 (0.673-1.456)	0.960
Fibrosarcoma	0.440 (0.275-0.705)	0.001	0.503 (0.305-0.829)	0.007	1.280 (0.922-1.777)	0.141	1.516 (1.062-2.165)	0.022
Stage								
Ⅰ	Reference	0.016	Reference	0.839	Reference	<0.001	Reference	0.005
Ⅱ	1.502 (1.116-2.020)	0.007	1.196 (0.643-2.224)	0.572	1.213 (0.953-1.544)	0.117	0.932 (0.508-1.712)	0.821
Ⅲ + Ⅳ	1.503 (0.972-2.323)	0.067	1.038 (0.627-1.720)	0.885	2.072 (1.434-2.993)	<0.001	1.797 (1.135-2.843)	0.012
Maximum diameter of tumor, cm								
<10.0	Reference		Reference		Reference			
≥10.0	1.347 (1.018-1.781)	0.037	0.963 (0.536-1.730)	0.900	1.239 (0.985-1.558)	0.067	1.572 (0.882-2.800)	0.125

	HR (95% CI)	p	HR (95% CI)	p	HR (95% CI)	p
BMI rank						
Underweight	Reference	0.734			Reference	0.423
Normal	1.055 (0.694-1.603)	0.804			1.226 (0.872-1.724)	0.242
Overweight	0.859 (0.515-1.431)	0.559			1.253 (0.838-1.874)	0.271
Obese	0.827 (0.250-2.735)	0.756			0.718 (0.283-1.824)	0.486
SII						
<619.85	Reference		Reference		Reference	
≥619.85	1.513 (1.139-2.009)	0.004	1.172 (0.840-1.637)	0.351	1.015 (0.795-1.296)	0.904
CRP						
<5.0	Reference		Reference		Reference	
≥5.0	1.619 (1.167-2.245)	0.004	1.318 (0.909-1.912)	0.145	1.195 (0.887-1.610)	0.241
CONUT score						
0~2	Reference		Reference		Reference	
3~12	1.477 (1.016-2.145)	0.041	1.048 (0.693-1.584)	0.825	0.873 (0.599-1.272)	0.479
MUST group						
Low risk	Reference	0.445			Reference	0.582
Medium risk	0.959 (0.640-1.436)	0.839			1.007 (0.743-1.365)	0.962
High risk	1.218 (0.873-1.699)	0.246			0.866 (0.653-1.147)	0.315
Subcutaneous adiposity						
No	Reference				Reference	
Yes	0.905 (0.682-1.202)	0.491			0.989 (0.791-1.236)	0.922
Visceral adiposity						
No	Reference				Reference	
Yes	0.885 (0.672-1.166)	0.385			0.972 (0.782-1.208)	0.799
Sarcopenia						
No	Reference				Reference	
Yes	1.018 (0.773-1.341)	0.898			1.084 (0.872-1.347)	0.467
Complication						

	Univariate OS HR (95% CI)	P	Multivariate OS HR (95% CI)	P	Univariate PFS HR (95% CI)	P	Multivariate PFS HR (95% CI)	P
No	Reference		Reference		Reference			
Yes	1.381 (1.013-1.883)	0.041	1.054 (0.760-1.462)	0.751	0.980 (0.745-1.288)	0.882		
Length of hospitalization, day								
1~7	Reference	0.488			Reference	0.031	Reference	0.037
7~30	1.137 (0.792-1.632)	0.486			0.821 (0.626-1.077)	0.154	0.833 (0.628-1.105)	0.205
30~	1.382 (0.813-2.347)	0.232			0.538 (0.338-0.854)	0.009	0.538 (0.335-0.864)	0.010

*Variables with P value less than 0.05 would be considered significant in univariate Cox regression analysis and be included into the multivariate Cox proportional model.

BMI: body mass index; SII: systematic inflammatory index; CONUT: controlling nutritional score; CT: computed tomography; MUST: Malnutrition Universal Screening Tool; OS: overall survival;

PFS: progression-free survival; CI: confidential interval.

Supplementary Table 2: The results of binary logistic regression for patients with soft-tissue sarcomas receiving surgical resection between clinical characteristics and nutritional assessment tools, and length of postoperative hospital day in the training group (comparison between 0~14 day and 14~ day)*

Variable	Length of hospitalization (day)			
	Univariate analysis		Multivariate analysis	
	OR	P value	OR	P value
Age, y				
<65	Reference		Reference	
≥65	1.878 (1.159-3.044)	0.010	1.121 (0.629-2.000)	0.698
Gender				
Male	Reference			
Female	0.762 (0.520-1.115)	0.162		
Location of primary tumor				
Trunk	Reference		Reference	
Limb	0.454 (0.279-0.740)	0.002	0.473 (0.276-0.810)	0.006
Subtype				
Liposarcoma	Reference	0.008	Reference	0.046
Rhabdomyosarcoma	0.802 (0.402-1.604)	0.533	0.784 (0.369-1.666)	0.527
Synovial sarcoma	1.329 (0.655-2.698)	0.431	1.835 (0.838-4.019)	0.129
Undifferentiated sarcoma	1.751 (0.935-3.277)	0.080	2.058 (0.999-4.237)	0.050
Leiomyosarcoma	0.973 (0.522-1.815)	0.932	0.958 (0.480-1.910)	0.903
Fibrosarcoma	0.525 (0.286-0.963)	0.037	0.814 (0.411-1.615)	0.557
Stage				
I	Reference	0.005	Reference	0.829
II	2.120 (1.397-3.217)	<0.001	0.812 (0.317-2.083)	0.665
III + IV	1.656 (0.917-2.990)	0.094	0.791 (0.369-1.696)	0.547
Maximum diameter of tumor, cm				
<10.0	Reference		Reference	
≥10.0	2.180 (1.473-3.227)	<0.001	2.239 (0.924-5.429)	0.074

BMI rank				
Underweight	Reference	0.184		
Normal	0.541 (0.306-0.956)	0.035		
Overweight	0.606 (0.306-1.199)	0.150		
Obese	0.360 (0.064-2.011)	0.244		
SII				
<619.85	Reference		Reference	
≥619.85	2.366 (1.582-3.539)	<0.001	1.595 (0.951-2.674)	0.077
CRP				
<5.0	Reference		Reference	
≥5.0	1.826 (1.134-2.939)	0.013	0.881 (0.488-1.591)	0.676
CONUT score				
0~2	Reference		Reference	
3~12	3.001 (1.722-5.231)	<0.001	1.417 (0.727-2.761)	0.306
MUST group				
Low risk	Reference	0.022	Reference	0.381
Medium risk	1.255 (0.737-2.139)	0.403	0.833 (0.459-1.511)	0.548
High risk	1.934 (1.212-3.088)	0.006	1.328 (0.764-2.308)	0.315
Subcutaneous adiposity				
No	Reference			
Yes	0.871 (0.589-1.287)	0.488		
Visceral adiposity				
No	Reference			
Yes	0.900 (0.616-1.315)	0.587		
Sarcopenia				
No	Reference		Reference	
Yes	1.536 (1.048-2.250)	0.028	1.200 (0.771-1.867)	0.420
Complication				

No	Reference		Reference	
Yes	2.115 (1.360-3.289)	0.001	1.618 (0.965-2.712)	0.068

*Variables with P value less than 0.05 would be considered significant in univariate analysis and be included into the multivariate model.

BMI: body mass index; SII: systematic inflammatory index; CONUT: controlling nutritional score; CT: computed tomography; MUST: Malnutrition Universal Screening Tool; OS: overall survival;

PFS: progression-free survival; CI: confidential interval.