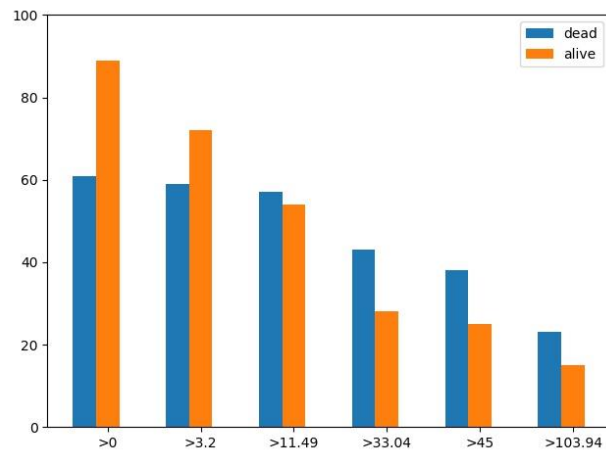


Supplemental material

Figure



Supplemental Figure 1: Number of patients with positive/negative outcome (alive/dead) for different volume ranges

Histology		Smoking status		Therapy	
Adenocarcinoma	67	Never smoked	5	Lobectomy	25
Spinocellulair carcinoma	38	Stopped more than 6 month ago	64	Lobectomy + Chemotherapy	18
Oatcell carcinoma	18	Active	81	Lobectomy + radiotherapy	8
Large cell carcinoma	5			Palliative treatment	24
Unknown	23			No treatment	6
				Chemotherapy	41
				Chemotherapy + Radiotherapy	25
				Radiotherapy	3

Supplemental Table 1: Additional patient characteristics

Tables

Reproducible radiomic features

Feature group	Feature name
Intensity volume feature	int_at_vol_fraction_10
GLCM feature	joint_maximum2Davg
GLCM feature	joint_entropy2Davg
GLCM feature	difference_average2Davg

GLCM feature	sum_entropy2Davg
GLCM feature	contrast2Davg
GLCM feature	dissimilarity2Davg
GLCM feature	inverse_difference2Davg
GLCM feature	inverse_difference_moment2Davg
GLCM feature	joint_maximum2Dmrg
GLCM feature	joint_entropy2Dmrg
GLCM feature	difference_average2Dmrg
GLCM feature	difference_variance2Dmrg
GLCM feature	difference_entropy2Dmrg
GLCM feature	sum_entropy2Dmrg
GLCM feature	contrast2Dmrg
GLCM feature	dissimilarity2Dmrg
GLCM feature	inverse_difference2Dmrg
GLCM feature	inverse_difference_moment2Dmrg
GLCM feature	joint_average2Dvmrg
GLCM feature	difference_average2Dvmrg
GLCM feature	difference_variance2Dvmrg
GLCM feature	sum_average2Dvmrg
GLCM feature	contrast2Dvmrg
GLCM feature	dissimilarity2Dvmrg
GLCM feature	joint_average3Davg
GLCM feature	sum_average3Davg
GLCM feature	inverse_variance3Davg
GLCM feature	joint_average3Dwmrg
GLCM feature	sum_average3Dwmrg
GLCM feature	inverse_variance3Dwmrg
GLRLM feature	short_run_emphasis2Davg
GLRLM feature	long_runs_emphasis2Davg
GLRLM feature	Grey_level_non_uniformity2Davg
GLRLM feature	Run_length_non_uniformity2Davg
GLRLM feature	Run_length_non_uniformity_normalized2Davg
GLRLM feature	Run_percentage2Davg
GLRLM feature	Run_entropy2Davg
GLRLM feature	short_run_emphasis2Dwmrg
GLRLM feature	Grey_level_non_uniformity2Dwmrg
GLRLM feature	Run_length_non_uniformity2Dwmrg
GLRLM feature	Run_length_non_uniformity_normalized2Dwmrg
GLRLM feature	Run_percentage2Dwmrg
GLRLM feature	Grey_level_non_uniformity2Dvmrg
GLRLM feature	Run_length_non_uniformity2Dvmrg
GLRLM feature	Run_length_variance2Dvmrg
GLRLM feature	Run_entropy2Dvmrg
GLRLM feature	Low_grey_level_run_emphasis3Davg
GLRLM feature	Short_run_low_grey_level_emphasis3Davg

GLRLM feature	Grey_level_non_uniformity3Davg
GLRLM feature	Run_length_non_uniformity3Davg
GLRLM feature	Low_grey_level_run_emphasis3Dmrg
GLRLM feature	Short_run_low_grey_level_emphasis3Dmrg
GLRLM feature	Grey_level_non_uniformity3Dmrg
GLRLM feature	Run_length_non_uniformity3Dmrg
GLSZM feature	small_zone_emphasis2Davg
GLSZM feature	Grey_level_non_uniformity_GLSZM2Davg
GLSZM feature	Zone_size_non_uniformity_normalized2Davg
GLSZM feature	Zone_percentage_GLSZM2Davg
GLSZM feature	Zone_size_entropy2Davg
GLSZM feature	Grey_level_non_uniformity_GLSZM2Dvmrg
GLSZM feature	Zone_size_non_uniformity_normalized2Dvmrg
GLSZM feature	Large_zone_high_grey_level_emphasis3D
GLSZM feature	Grey_level_non_uniformity_GLSZM3D
NGTDM feature	coarseness2Dmrg
NGTDM feature	contrast2Dmrg
NGTDM feature	coarseness3D
GLDZM feature	small_distance_emphasis_GLDZM2Davg
GLDZM feature	Grey_level_non_uniformity_GLDZM2Davg
GLDZM feature	Zone_distance_non_uniformity_GLDZM2Davg
GLDZM feature	Zone_distance_non_uniformity_normalized_GLDZM2Davg
GLDZM feature	Zone_percentage_GLDZM2Davg
GLDZM feature	Grey_level_non_uniformity_GLDZM2Dmrg
GLDZM feature	Zone_distance_non_uniformity_GLDZM2Dmrg
GLDZM feature	Grey_level_non_uniformity_GLDZM3D
NGLDM feature	Low_dependence_emphasis2Davg
NGLDM feature	Grey_level_non_uniformity2Davg
NGLDM feature	Dependence_count_non_uniformity2Davg
NGLDM feature	Dependence_count_entropy2Davg
NGLDM feature	Low_dependence_emphasis2Dmrg
NGLDM feature	Low_dependence_high_grey_level_emphasis2Dmrg
NGLDM feature	Grey_level_non_uniformity2Dmrg
NGLDM feature	Dependence_count_non_uniformity2Dmrg
NGLDM feature	Dependence_count_percentage2Dmrg
NGLDM feature	Grey_level_non_uniformity3Dmrg

Table 2: Abbreviations: GLCM: Grey level co-occurrence. GLRLM: Grey-Level-Run-Length Matrix. GLSZM: Grey-Level-Size Zone Matrix. GLDZM: Grey-Level-Distance-Zone-Matrix. NGLDM: Neighborhood Grey Level Dependence Matrix

Feature name	Correlation with MATV	Correlation with SUVMEAN	Correlation with SUVPEAK
joint_average2Dvmrg	0.43	0.99	0.93
sum_average2Dvmrg	0.43	0.99	0.93
joint_average3Davg	0.43	0.99	0.93

sum_average3Davg	0.43	0.99	0.93
joint_average3DWmrg	0.43	0.99	0.93
sum_average3DWmrg	0.43	0.99	0.93
Grey_level_non_uniformity2Davg	0.86	0.06	0.24
Grey_level_non_uniformity2DWmrg	0.86	0.06	0.24
Grey_level_non_uniformity2Dvmrg	0.94	0.18	0.37
Run_entropy2Dvmrg	0.60	0.96	0.97
Short_run_low_grey_level_emphasis3Davg	-0.54	-0.99	-0.93
Grey_level_non_uniformity3Davg	0.94	0.17	0.36
Short_run_low_grey_level_emphasis3Dmrg	-0.54	-0.99	-0.93
Grey_level_non_uniformity3Dmrg	0.94	0.17	0.36
coarseness2Dmrg	-0.98	-0.36	-0.54
coarseness3D	-0.99	-0.38	-0.56
Low_dependence_high_grey_level_emphasis2Dmrg	0.30	0.96	0.90
Grey_level_non_uniformity2Dmrg	0.92	0.15	0.34
Grey_level_non_uniformity3Dmrg	0.94	0.17	0.36

Table 3: Features outside the random range when the whole dataset is included. Features in bold are the features which are left after eliminating features that are highly correlated to conventional metrics. The feature marked in yellow is left after eliminating mutual correlation of the features.

Feature name	Correlation with MATV	Correlation with SUVMEAN	Correlation with SUVPEAK
int_at_vol_fraction_10	0.25	0.97	0.93
joint_average2Dvmrg	0.25	1.00	0.91
sum_average2Dvmrg	0.25	1.00	0.91
joint_average3Davg	0.24	1.00	0.91
sum_average3Davg	0.24	1.00	0.91
joint_average3DWmrg	0.25	1.00	0.91
sum_average3DWmrg	0.25	1.00	0.91
Grey_level_non_uniformity2Davg	0.82	-0.21	-0.01
Grey_level_non_uniformity2DWmrg	0.82	-0.21	-0.01
Grey_level_non_uniformity2Dvmrg	0.92	-0.09	0.13
Run_entropy2Dvmrg	0.44	0.96	0.96
Low_grey_level_run_emphasis3Davg	-0.30	-0.99	-0.89

Short_run_low_grey_level_emphasis3Davg	-0.38	-0.98	-0.91
Grey_level_non_uniformity3Davg	0.91	-0.09	0.13
Low_grey_level_run_emphasis3Dmrg	-0.30	-0.99	-0.89
Short_run_low_grey_level_emphasis3Dmrg	-0.38	-0.98	-0.91
Grey_level_non_uniformity3Dmrg	0.91	-0.09	0.13
Grey_level_non_uniformity_GLSZM2Dvmrg	0.96	0.07	0.27
coarseness2Dmrg	-0.98	-0.14	-0.37
coarseness3D	-0.98	-0.17	-0.39
Grey_level_non_uniformity_GLDZM2Dmrg	0.96	0.07	0.27
Grey_level_non_uniformity2Davg	0.82	-0.21	-0.01
Low_dependence_high_grey_level_emphasis2Dmrg	0.15	0.97	0.90
Grey_level_non_uniformity2Dmrg	0.90	-0.12	0.10
Grey_level_non_uniformity3Dmrg	0.91	-0.09	0.13

Table 4: Features outside the random range when excluding lesions with MATV<3.2 mL. Features in bold are the features which are left after eliminating features that are highly correlated to conventional metrics. Features marked in yellow are left after eliminating mutual correlated features.

Feature name	Correlation with MATV	Correlation with SUVMEAN	Correlation with SUVPEAK
int_at_vol_fraction_10	0.10	0.97	0.92
joint_average2Dvmrg	0.10	1.00	0.90
sum_average2Dvmrg	0.10	1.00	0.90
joint_average3Davg	0.10	1.00	0.90
sum_average3Davg	0.10	1.00	0.90
joint_average3Dwmrg	0.10	1.00	0.90
sum_average3Dwmrg	0.10	1.00	0.90
Grey_level_non_uniformity2Davg	0.78	-0.42	-0.24
Grey_level_non_uniformity2Dwmrg	0.78	-0.42	-0.24
Grey_level_non_uniformity2Dvmrg	0.89	-0.31	-0.11
Run_entropy2Dvmrg	0.27	0.96	0.95
Low_grey_level_run_emphasis3Davg	-0.13	-0.99	-0.86
Short_run_low_grey_level_emphasis3Davg	-0.20	-0.98	-0.87
Grey_level_non_uniformity3Davg	0.88	-0.31	-0.11

Low_grey_level_run_emphasis3Dmrg	-0.13	-0.99	-0.86
Short_run_low_grey_level_emphasis3Dmrg	-0.20	-0.98	-0.87
Grey_level_non_uniformity3Dmrg	0.88	-0.31	-0.11
Grey_level_non_uniformity_GLSZM2Davg	0.86	-0.17	-0.04
Grey_level_non_uniformity_GLSZM2Dvmrg	0.94	-0.14	0.04
coarseness2Dmrg	-0.96	0.05	-0.16
coarseness3D	-0.98	0.02	-0.19
Grey_level_non_uniformity_GLDZM2Davg	0.86	-0.17	-0.04
Grey_level_non_uniformity_GLDZM2Dmrg	0.94	-0.14	0.04
Grey_level_non_uniformity2Davg	0.78	-0.42	-0.24
Low_dependence_high_grey_level_emphasis2Dmrg	0.04	0.97	0.91
Grey_level_non_uniformity2Dmrg	0.87	-0.34	-0.13
Grey_level_non_uniformity3Dmrg	0.88	-0.31	-0.11

Table 5: Features outside the random range when excluding lesions with MATV<11.48 mL. Features in bold are the features which are left after eliminating features that are highly correlated to conventional metrics. Features marked in yellow are left after eliminating mutual correlated features.

Feature name	Correlation with MATV	Correlation with SUVMEAN	Correlation with SUVPEAK
difference_average2Davg	-0.18	0.88	0.84
sum_entropy2Davg	-0.03	0.79	0.76
dissimilarity2Davg	-0.18	0.88	0.84
difference_average2Dmrg	-0.18	0.88	0.84
difference_variance2Dmrg	-0.13	0.90	0.90
difference_entropy2Dmrg	-0.15	0.83	0.81
dissimilarity2Dmrg	-0.18	0.88	0.84
joint_average2Dvmrg	-0.14	1.00	0.87
difference_variance2Dvmrg	-0.21	0.90	0.92
sum_average2Dvmrg	-0.14	1.00	0.87
contrast2Dvmrg	-0.23	0.92	0.89
joint_average3Davg	-0.15	1.00	0.87
sum_average3Davg	-0.15	1.00	0.87
joint_average3Dwmrg	-0.15	1.00	0.87
sum_average3Dwmrg	-0.15	1.00	0.87
long_runs_emphasis2Davg	0.29	-0.64	-0.57
Grey_level_non_uniformity2Davg	0.68	-0.70	-0.56
Grey_level_non_uniformity2Dwmrg	0.69	-0.70	-0.55

Grey_level_non_uniformity2Dvmrg	0.84	-0.61	-0.44
Run_length_variance2Dvmrg	0.34	-0.81	-0.71
Run_entropy2Dvmrg	-0.04	0.95	0.91
Low_grey_level_run_emphasis3Davg	0.12	-0.98	-0.81
Short_run_low_grey_level_emphasis3Davg	0.09	-0.98	-0.82
Grey_level_non_uniformity3Davg	0.84	-0.61	-0.44
Low_grey_level_run_emphasis3Dmrg	0.12	-0.98	-0.81
Short_run_low_grey_level_emphasis3Dmrg	0.09	-0.98	-0.82
Grey_level_non_uniformity3Dmrg	0.84	-0.61	-0.44
Grey_level_non_uniformity_GLSZ M2Davg	0.77	-0.47	-0.38
Zone_percentage_GLSZM2Davg	-0.24	0.79	0.72
Grey_level_non_uniformity_GLSZ M2Dvmrg	0.90	-0.42	-0.27
Grey_level_non_uniformity_GLSZ M3D	0.86	0.12	0.19
coarseness2Dmrg	-0.94	0.36	0.16
coarseness3D	-0.95	0.34	0.14
Grey_level_non_uniformity_GLDZ M2Davg	0.77	-0.47	-0.38
Zone_distance_non_uniformity_GLDZM2Davg	0.72	0.07	0.20
Zone_percentage_GLDZM2Davg	-0.24	0.79	0.72
Grey_level_non_uniformity_GLDZ M2Dmrg	0.90	-0.42	-0.27
Zone_distance_non_uniformity_GLDZM2Dmrg	0.91	-0.09	0.07
Grey_level_non_uniformity_GLDZ M3D	0.86	0.12	0.19
Grey_level_non_uniformity2Davg	0.68	-0.70	-0.56
Grey_level_non_uniformity2Dmrg	0.83	-0.62	-0.44
Grey_level_non_uniformity3Dmrg	0.84	-0.61	-0.44

Table 6: Features outside the random range when excluding lesions with MATV<33.04 mL. Features in bold are the features which are left after eliminating features that are highly correlated to conventional metrics. Features marked in yellow are left after eliminating mutual correlated features.

Feature name	Correlation with MATV	Correlation with SUVMEAN	Correlation with SUVPEAK
int_at_vol_fraction_10	-0.08	0.97	0.90
sum_entropy2Davg	0.01	0.78	0.76
difference_average2Dmrg	-0.11	0.87	0.84
difference_variance2Dmrg	-0.07	0.89	0.90
difference_entropy2Dmrg	-0.10	0.82	0.80
dissimilarity2Dmrg	-0.11	0.87	0.84

joint_average2Dvmrg	-0.07	1.00	0.87
difference_variance2Dvmrg	-0.13	0.90	0.92
sum_average2Dvmrg	-0.07	1.00	0.87
contrast2Dvmrg	-0.14	0.92	0.90
joint_average3Davg	-0.07	1.00	0.87
sum_average3Davg	-0.07	1.00	0.87
inverse_variance3Davg	0.20	-0.93	-0.85
joint_average3DWmrg	-0.07	1.00	0.87
sum_average3DWmrg	-0.07	1.00	0.87
long_runs_emphasis2Davg	0.24	-0.62	-0.56
Grey_level_non_uniformity2Davg	0.61	-0.70	-0.56
Grey_level_non_uniformity2DWmrg	0.61	-0.70	-0.56
Grey_level_non_uniformity2Dvmrg	0.80	-0.61	-0.44
Run_length_variance2Dvmrg	0.26	-0.81	-0.71
Run_entropy2Dvmrg	0.03	0.95	0.91
Low_grey_level_run_emphasis3Davg	0.07	-0.98	-0.80
Short_run_low_grey_level_emphasis3Davg	0.04	-0.98	-0.82
Grey_level_non_uniformity3Davg	0.80	-0.61	-0.44
Low_grey_level_run_emphasis3Dmrg	0.07	-0.98	-0.80
Short_run_low_grey_level_emphasis3Dmrg	0.04	-0.98	-0.82
Grey_level_non_uniformity3Dmrg	0.79	-0.61	-0.44
Grey_level_non_uniformity_GLSZM2Davg	0.72	-0.44	-0.36
Zone_percentage_GLSZM2Davg	-0.16	0.78	0.72
Grey_level_non_uniformity_GLSZM2Dvmrg	0.87	-0.39	-0.25
Grey_level_non_uniformity_GLSZM3D	0.83	0.20	0.25
coarseness2Dmrg	-0.92	0.33	0.13
coarseness3D	-0.93	0.30	0.10
Grey_level_non_uniformity_GLDZM2Davg	0.72	-0.44	-0.36
Zone_distance_non_uniformity_GLDZM2Davg	0.68	0.10	0.23
Zone_percentage_GLDZM2Davg	-0.16	0.78	0.72
Grey_level_non_uniformity_GLDZM2Dmrg	0.87	-0.39	-0.25
Zone_distance_non_uniformity_GLDZM2Dmrg	0.88	-0.03	0.13
Grey_level_non_uniformity_GLDZM3D	0.83	0.20	0.25
Grey_level_non_uniformity2Davg	0.61	-0.70	-0.56
Grey_level_non_uniformity2Dmrg	0.78	-0.63	-0.44
Grey_level_non_uniformity3Dmrg	0.79	-0.61	-0.44

Table 7: Features outside the random range when excluding lesions with MATV<45 mL. Features in bold are the features which are left after eliminating features that are highly correlated to conventional metrics. Features marked in yellow are left after eliminating mutual correlated features.

Feature name	Correlation with MATV	Correlation with SUVMEAN	Correlation with SUVPEAK
int_at_vol_fraction_10	-0.09	0.96	0.90

sum_entropy2Davg	-0.13	0.71	0.80
difference_variance2Dmrg	-0.05	0.83	0.91
difference_entropy2Dmrg	-0.15	0.75	0.82
sum_entropy2Dmrg	-0.13	0.72	0.80
joint_average2Dvmrg	-0.15	1.00	0.87
difference_average2Dvmrg	-0.13	0.91	0.91
difference_variance2Dvmrg	-0.09	0.88	0.95
sum_average2Dvmrg	-0.15	1.00	0.87
contrast2Dvmrg	-0.12	0.90	0.92
dissimilarity2Dvmrg	-0.13	0.91	0.91
joint_average3Davg	-0.14	1.00	0.87
sum_average3Davg	-0.14	1.00	0.87
inverse_variance3Davg	0.18	-0.91	-0.92
joint_average3Dwmrg	-0.14	1.00	0.87
sum_average3Dwmrg	-0.14	1.00	0.87
inverse_variance3Dwmrg	0.18	-0.91	-0.92
long_runs_emphasis2Davg	0.26	-0.59	-0.65
Grey_level_non_uniformity2Davg	0.44	-0.82	-0.77
Run_percentage2Davg	-0.22	0.64	0.70
Grey_level_non_uniformity2Dwmrg	0.44	-0.82	-0.77
Run_percentage2Dwmrg	-0.22	0.64	0.70
Grey_level_non_uniformity2Dvmrg	0.68	-0.77	-0.66
Run_length_variance2Dvmrg	0.23	-0.82	-0.79
Run_entropy2Dvmrg	-0.11	0.96	0.88
Low_grey_level_run_emphasis3Davg	0.16	-0.98	-0.81
Short_run_low_grey_level_emphasis 3Davg	0.15	-0.98	-0.81
Grey_level_non_uniformity3Davg	0.68	-0.77	-0.67
Run_length_non_uniformity3Davg	0.90	0.19	0.23
Low_grey_level_run_emphasis3Dmrg	0.16	-0.98	-0.81
Short_run_low_grey_level_emphasis 3Dmrg	0.14	-0.98	-0.81
Grey_level_non_uniformity3Dmrg	0.68	-0.77	-0.67
Run_length_non_uniformity3Dmrg	0.90	0.19	0.23
Grey_level_non_uniformity_GLSZM 2Davg	0.51	-0.60	-0.57
Zone_percentage_GLSZM2Davg	-0.18	0.73	0.77
Zone_size_entropy2Davg	-0.01	0.46	0.61
Grey_level_non_uniformity_GLSZM 2Dvmrg	0.74	-0.53	-0.44
Grey_level_non_uniformity_GLSZM 3D	0.78	0.17	0.20
coarseness2Dmrg	-0.85	0.47	0.30
coarseness3D	-0.86	0.46	0.28
small_distance_emphasis_GLDZM2	0.16	-0.70	-0.67

Davg			
Grey_level_non_uniformity_GLDZM2Davg	0.51	-0.60	-0.57
Zone_distance_non_uniformity_GLDZM2Davg	0.48	0.01	0.14
Zone_percentage_GLDZM2Davg	-0.18	0.73	0.77
Grey_level_non_uniformity_GLDZM2Dmrg	0.74	-0.53	-0.44
Zone_distance_non_uniformity_GLDZM2Dmrg	0.82	-0.12	0.02
Grey_level_non_uniformity_GLDZM3D	0.78	0.17	0.20
Grey_level_non_uniformity2Davg	0.44	-0.82	-0.77
Dependence_count_entropy2Davg	-0.03	0.58	0.67
Low_dependence_high_grey_level_emphasis2Dmrg	-0.15	0.96	0.92
Grey_level_non_uniformity2Dmrg	0.67	-0.78	-0.68
Dependence_count_non_uniformity2Dmrg	0.82	0.35	0.40
Grey_level_non_uniformity3Dmrg	0.68	-0.77	-0.67

Table 8: Features outside the random range when excluding lesions with MATV<133 mL. Features in bold are the features which are left after eliminating features that are highly correlated to conventional metrics. Features marked in yellow are left after

Feature name	volume range/ml	Model 1	Model 2	Model 3
coarseness 2Dmrg	>0	0.58	0.65	0.69
	>3.2	0.63	0.63	0.69
	>11.49	0.62	0.61	0.72
	>33.04	0.45	0.44	0.72
	>45.00	0.46	0.44	0.73
	>103.94	0.44	0.467	0.73
coarseness 3D	>0	0.61	0.67	0.68
	>3.2	0.64	0.62	0.69
	>11.49	0.63	0.61	0.69
	>33.04	0.46	0.45	0.73
	>45.00	0.47	0.46	0.73
	>103.94	0.46	0.45	0.74

Dependence count non uniformity 2Dmrg	>0	0.66	0.67	0.65
	>3.2	0.60	0.63	0.67
	>11.49	0.56	0.59	0.69
	>33.04	0.49	0.46	0.74
	>45.00	0.45	0.45	0.74
	>103.94	0.46	0.49	0.75
Difference entropy 2Dmrg	>0	0.574514	0.65	0.71
	>3.2	0.511039	0.58	0.73
	>11.49	0.484833	0.52	0.73
	>33.04	0.473556	0.45	0.73
	>45.00	0.498893	0.42	0.73
	>103.94	0.563833	0.56	0.73
Grey level non uniformity GLDZM 2Davg	>0	0.68	0.66	0.61
	>3.2	0.64	0.65	0.64
	>11.49	0.63	0.63	0.67
	>33.04	0.44	0.44	0.73
	>45.00	0.45	0.44	0.72
	>103.94	0.45	0.5	0.73
Grey level non uniformity GLDZM 3D	>0	0.67	0.69	0.65
	>3.2	0.62	0.63	0.66
	>11.49	0.59	0.58	0.70
	>33.04	0.47	0.45	0.74
	>45.00	0.45	0.42	0.74
	>103.94	0.51	0.47	0.75
Grey level non uniformity	>0	0.67	0.65	0.65
	>3.2	0.57	0.61	0.67

GLCM 2Davg	>11.49	0.49	0.55	0.70
	>33.04	0.47	0.45	0.74
	>45.00	0.49	0.42	0.74
	>103.94	0.60	0.57	0.76
Grey level non uniformity GLCM 2Dmrg	>0	0.66	0.66	0.59
	>3.2	0.61	0.62	0.60
	>11.49	0.58	0.59	0.66
	>33.04	0.44	0.46	0.74
	>45.00	0.47	0.42	0.73
	>103.94	0.46	0.45	0.75
Grey level non uniformity GLCM 2Dvmrg	>0	0.67	0.65	0.71
	>3.2	0.64	0.63	0.73
	>11.49	0.59	0.62	0.73
	>33.04	0.45	0.47	0.73
	>45.00	0.45	0.43	0.73
	>103.94	0.46	0.45	0.73
Grey level non uniformity GLDZM 3Dmrg	>0	0.66	0.65	0.64
	>3.2	0.64	0.62	0.66
	>11.49	0.59	0.60	0.70
	>33.04	0.44	0.47	0.74
	>45.00	0.46	0.43	0.74
	>103.94	0.46	0.46	0.75
Long runs emphasis GLRLM 2Dmrg	>0	0.48	0.65	0.71
	>3.2	0.47	0.59	0.73
	>11.49	0.49	0.53	0.74
	>33.04	0.57	0.50	0.74

	>45.00	0.59	0.47	0.74
	>103.94	0.59	0.55	0.74
Run length non uniformity GLRLM 3Dmrg	>0	0.68	0.67	0.61
	>3.2	0.63	0.62	0.64
	>11.49	0.60	0.61	0.71
	>33.04	0.46	0.46	0.75
	>45.00	0.47	0.43	0.75
	>103.94	0.46	0.47	0.75
	Run length variance GLRLM 2Dvmrg	>0	0.49	0.65
>3.2		0.49	0.60	0.72
>11.49		0.47	0.52	0.73
>33.04		0.51	0.46	0.73
>45.00		0.50	0.42	0.73
>103.94		0.57	0.56	0.76
Run percentage GLRLM 2Dmrg		>0	0.48	0.65
	>3.2	0.47	0.58	0.73
	>11.49	0.48	0.51	0.73
	>33.04	0.559	0.48	0.73
	>45.00	0.58	0.44	0.73
	>103.94	0.61	0.55	0.73
	Small distance emphasis GLDZM 2Davg	>0	0.66	0.67
>3.2		0.60	0.61	0.64
>11.49		0.49	0.55	0.67
>33.04		0.46	0.47	0.73
>45.00		0.47	0.435	0.73
>103.94		0.47	0.51	0.74

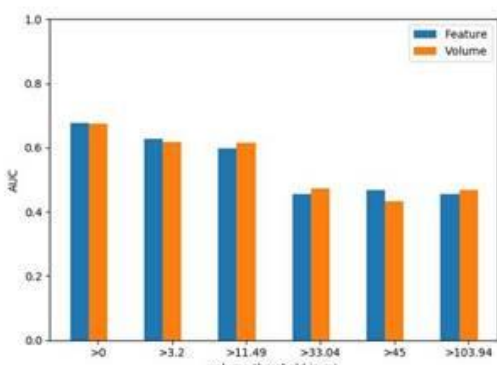
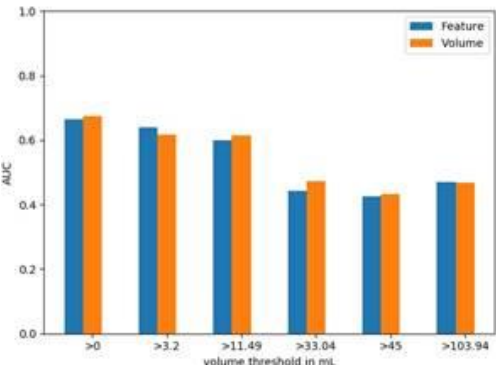
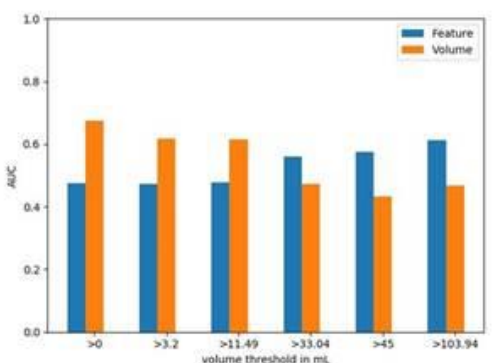
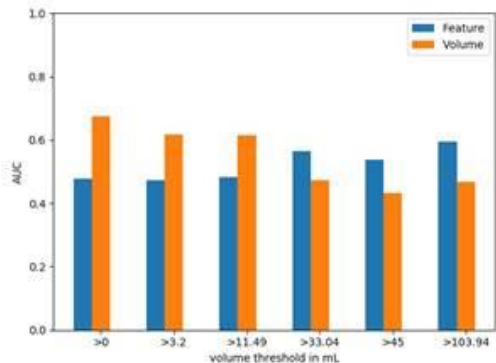
Zone distance non uniformity GLDZM 2Davg	>0	0.64	0.68	0.62
	>3.2	0.62	0.61	0.64
	>11.49	0.63	0.60	0.67
	>33.04	0.49	0.47	0.73
	>45.00	0.49	0.45	0.73
	>103.94	0.45	0.42	0.74
Zone distance non uniformity GLDZM 2Dmrg	>0	0.66	0.67	0.70
	>3.2	0.64	0.63	0.72
	>11.49	0.60	0.58	0.72
	>33.04	0.46	0.49	0.72
	>45.00	0.45	0.44	0.73
	>103.94	0.45	0.55	0.73
Zone distance non uniformity GLDZM 2Davg	>0	0.47	0.66	0.63
	>3.2	0.48	0.59	0.65
	>11.49	0.48	0.55	0.67
	>33.04	0.49	0.46	0.73
	>45.00	0.51	0.43	0.73
	>103.94	0.59	0.57	0.74
Zone size entropy GLDZM 2Davg	>0	0.67	0.66	0.71
	>3.2	0.62	0.62	0.73
	>11.49	0.56	0.52	0.73
	>33.04	0.53	0.51	0.73
	>45.00	0.53	0.48	0.73
	>103.94	0.56	0.56	0.73

Table 9: Mean AUC of Model 1 and 2, AUC of Model 3 for different features

Mean AUC using random upsampling of the minority class vs. SMOTE

Results random upsampling

Results SMOTE



Supplemental Figure 2: Mean AUC of the feature run percentage (upper row) achieved by using random upsampling of the majority class (left) vs. SMOTE (right), and mean AUC of the feature run length non uniformity (lower row) w