

Supplemental Table 1. Psoas muscle area and/or attenuation variables and outcome after vascular surgery			
Year & Reference	Number of patients	Study results	Association (Y/N)
2011 Lee <i>et al.</i> [1]	262 patients	- Mean follow-up was 2.3 years. - Cox regression: significant association between PMA and postoperative mortality ($P = 0.003$). - Among all covariates included in the Cox models: PMA was the most significant.	Yes
2016 Drudi <i>et al.</i> [2]	159 patients (elective endovascular or open aortic aneurysm repair)	After adjusting for age, sex, revised cardiac risk index, and surgical approach, Cox regression revealed a graded association between PMA and all-cause mortality with a HR of 0.86 per cm^2 (95% CI: 0.79-0.93).	Yes
2017 Ikeno <i>et al.</i> [3]	266 patients ≥ 65 years undergoing elective total arch replacement.	- The cut-off value for sarcopenia was defined as > 2 SD below the mean PMA index value obtained from 464 normal control patients. - 5-year survival was significantly worse in sarcopenic than non-sarcopenic patient (S: 63.2% vs. 88.7%, $P < 0.001$). - A multivariable analysis showed that sarcopenia significantly predicted poor survival (HR 2.59; $P = 0.011$).	Yes
2017 Shah <i>et al.</i> [4]	137 patients, endovascular (132) or open (5) abdominal aortic aneurysm repair	In multivariate analysis, mortality hazard (95%CI) was independently associated with the adjusted left PMA a 0.94 (0.81-1.01) per $\text{mm}^2 \cdot \text{kg}^{-0.83}$, $P = 0.08$. Shortened hospital stay was independently associated with adjusted left PMA (HR: 1.05; 95% CI: 1.02-1.07 per $\text{mm}^2 \cdot \text{kg}^{-0.83}$, $P = 0.001$).	Yes
2018 Thurstone <i>et al.</i> [5]	191 patients undergoing EVAR and available preoperative CT scans	- Sarcopenia (PMA $< 500 \text{ mm}^2/\text{m}^2$) has poorer survival (HR: 2.37; $P = 0.011$) and an increased hospital duration of stay ($P = .008$) when compared with nonsarcopenic patients. - Sarcopenic patients were more likely to self-report as unfit (12.4% vs. 33.3%; $P = 0.004$). Sarcopenia did not correlate with an increased rate of complications.	Yes
2017 Nyers <i>et al.</i> [6]	188 after Lower limb revascularization	(Psoas lumbal vertebra Inde) PLVI was not (HR: 2.6; 95% CI: 0.83-8.39; $P = 0.099$). Kaplan-Meier life-table analysis didn't demonstrated significant differences in survival between the highest and lowest PLVI cohorts of patients.	No
2018 Newton <i>et al.</i> [7]	135 patients who underwent EVAR	- Low PMA was not associated with extended length of stay ($P = 0.40$). Patients with lowest tertile MPA had 42% 5-year survival compared with 93% survival observed for the remaining two-thirds of patients ($P = 0.01$). - Multivariate analysis: 5-y mortality was lowest in patients in the lowest tertile for MPA (OR: 3.9; 95% CI: 1.2-12.9).	Yes
2017 Chowdhury <i>et al.</i> [8]	210 patients aged > 65 years admitted to a vascular unit	Psoas muscle area was significantly associated with readmission-free survival.	Yes
2018 Juszczak <i>et al.</i> [9]	263 patients considered for surgical lower limb revascularization	Lowest MPA quartile was an independent predictor of survival (HR, 1.89; $P = 0.028$). Low TPA was not associated with increased rate of postoperative complications or prolonged hospital stay.	Yes
2018 Gomibuchi <i>et al.</i> [10]	310 patients with Type A aortic dissection undergoing surgery	PMA was one of 7 frailty markers, with frailty score of 0 to 7 with each marker accounting for 1 point). 5-year survival rates were significantly worse for frail patients than for nonfrail patients (57.7% versus 85.1%, respectively; $P = 0.0001$). A frailty score of 3 or greater was associated with late mortality, and long-term outcomes were clearly stratified by frailty score.	+/-
2018 Sugai <i>et al.</i> [11]	327 patients with PAD undergoing endovascular therapy (EVT)	- The endpoint was major adverse cardiovascular and limb events (MACLE). - Patients with MACLE had lower mean PMHU value than those without. there was no significant difference in PMA between patients with and without MACLE. - Multivariate Cox hazard analysis: PMHU was associated with MACLE.	Yes
2019 Koter <i>et al.</i> [12]	156 patients (median age of 72 years) undergoing elective surgery for infrarenal abdominal aortic aneurysm	Hospital duration of stay and duration of intensive care stay longer in patients with low skeletal muscle (LSMM) as compared with patients with normal ($P = 0.001$, $P = 0.01$), respectively. The median overall hospital costs were higher for patients with a low skeletal muscle index (SMI) $P = 0.001$). After confounder adjustment, a low SMI was associated with a 14.68% cost increase in overall hospital costs.	Yes
2019 Lindström <i>et al.</i> [13]	301 patients undergoing endovascular treatment for AAA	L3 left psoas muscle density (PMD), total psoas muscle density, right and left LPMA, lean total psoas muscle area (LTPMA), and L2 right LPMA and LTPMA (HR 0.74-0.78 per 1 standard deviation, $P < 0.05$ to $P < 0.01$) were independently associated with improved survival in multivariable analysis.	Yes

2019 Panthofer <i>et al.</i> [14]	147 patients undergoing thoracic endovascular aortic	Thoracic sarcopenia can be readily and reliably reproduced from CT-derived measurement of T12-level muscle area. Future studies to assess the predictability of thoracic vs abdominal sarcopenia on postoperative outcomes will enhance the utility of these tools.	+/-
2019 Waduud <i>et al.</i> [15]	382 patients undergoing abdominal aortic aneurysm (AAA) intervention	Preintervention PMA failed to predict morbidity and mortality at all time points. A significant reduction in PMA was observed in men on surveillance imaging after EVAR ($P < 0.001$). This was not associated with mortality ($P = 0.935$).	No
2019 Cheng <i>et al.</i> [16]	272 EVAR-treated patients	There was a significant increase in overall mortality in patients in the lowest quartile of nTPA ($P = 0.01$). The estimated nTPA threshold for increased mortality after EVAR was $500 \text{ mm}^2/\text{m}^2$. Using this threshold, sarcopenia accounted for 57% of the risk effect in the 1-year survival model.	Yes
2020 Lareyre <i>et al.</i> [17]	80 patients admitted for acute mesenteric ischemia	Sarcopenia was defined as PMA normalized for height (PMA/H) inferior to the lowest sex-specific quartile. The 30-day mortality did not significantly differ between both groups ($P = 0.297$).	No
2019 Huber <i>et al.</i> [18]	407 patients who underwent EVAR	Multivariate analysis revealed lower PMA was associated with decreased survival (adjusted hazard ratio [AHR] 1.68; $P = 0.006$).	Yes
2020 Olson <i>et al.</i> [19]	217 patients undergoing TEVAR	Lumbar sarcopenia, by measuring PMA, was not associated with increased mortality at any time point.	No
2020 Kärkkäinen <i>et al.</i> [20]	244 patients after fenestrated-branched endovascular aortic repair (F-BEVAR)	Lean PMA (LPMA) was calculated ($\text{PMA} \times \text{PMD}$). A high LPMA was independently and strongly associated with better mid-term survival and QoL after F-BEVAR.	Yes
2020 Gomibuchi <i>et al.</i> [21]	324 patients with acute type A aortic dissection undergoing aortic replacement	Based on psoas muscle measurement, patients were grouped into intramuscular fat (IMF) and non-IMF deposition groups. IMF deposition was a risk factor for a deterioration in activities of daily living at discharge by multivariable analysis (OR 0.33; $P = 0.003$). The 5-year survival was significantly worse for the IMF deposition group (IMF 73.8% vs. non-IMF 88.2%; $P = 0.010$). The multivariable Cox analysis showed that IMF deposition significantly predicted poor survival (HR 3.26; $P = 0.004$), unlike PMI and age.	Yes
2020 Chen <i>et al.</i> [22]	174 patients with acute mesenteric ischemia	Multivariate analysis revealed that low PMA, Charlson Comorbidity Index (CCI) score ≥ 2 , and bowel resection were independent predictors of postoperative complications.	Yes
2020 Pizzimenti <i>et al.</i> [23]	64 patients with critical limb threatening ischemia	Sarcopenia was defined by $\text{PMI} < 5.5 \text{ cm}^2/\text{m}^2$ in men, and $< 4.0 \text{ cm}^2/\text{m}^2$ in women. Statistically significant differences in 30-day mortality and 30-day morbidity were found between the sarcopenic and non-sarcopenic group ($P = 0.15$ and $P < 0.001$, respectively).	+/-
2020 Miao <i>et al.</i> [24]	88 patients with acute mesenteric ischemia	Low psoas muscle density (PMD) patients had a higher risk of postoperative complications and 30-day mortality than patients without low PMD patients. In a multivariate analysis, low PMD and low psoas muscle area (PMA) were independent predictors of postoperative complications. However, only low PMD remained an independent risk factor for 30-day mortality.	Yes
2021 Oliveira <i>et al.</i> [25]	105 asymptomatic patients submitted to aortic endoprosthesis implantation	The multivariate analyses showed that the patients in the lower tertile of PMA and the lower tertile of LMA had an increased likelihood of mortality with ($P = 0.039$, HR: 3.829) and ($P = 0.026$, HR 4.153), respectively. Patients belonging to the lowest tertile of both TPA and LMA, had a reduced likelihood of survival ($P = 0.018$, HR 4.166) in the multivariate analysis.	Yes
2021 Kärkkäinen <i>et al.</i> [26]	504 fenestrated and branched endovascular aortic repair (FBEVAR).	Lean psoas muscle area (LPMA) was a strong predictor of outcomes and the only independent predictor of both mortality and major adverse events after FBEVAR. A high muscle mass was protective against complications.	Yes
2021 Alenezi <i>et al.</i> [27]	257 patients who underwent EVAR (fenestrated or branched technique)	Adjusted multivariable Cox regression demonstrated an 8% reduction in all-cause mortality for every 1 cm^2 increase in PMA ($P < 0.05$). PMA was associated with 30-day mortality (OR 0.85, $P < 0.05$) and spinal cord ischaemia (OR 0.89, $P < 0.05$). TPMA correlated negatively with hospital stay length ($P < 0.001$). Patients with lower PMA were more likely to be discharged to a rehabilitation center (OR 0.93, $P < 0.05$).	Yes
2021 Chatterjee <i>et al.</i> [28]	392 patients aged 60 years or older who underwent thoracoabdominal aortic aneurysm repairs	Sarcopenia, defined by $\text{PMA}/\text{height}^2$, independently predicts delayed paraplegia (OR: 3.17; $P = 0.005$) and persistent paraplegia (OR: 3.29; $P = 0.01$) in the multivariable model. Adjusted for preoperative/operative covariates, midterm survival was similar for sarcopenic and nonsarcopenic patients ($P = 0.3$).	Yes

Supplemental Table 2. Psoas muscle area and/or attenuation variables and outcome after trauma surgery			
Year & Reference	Number of patients	Study results	Association (Y/N)
2014 Ebbeling <i>et al.</i> [29]	180 patients with ICU stay > 48 hours	- Psoas: Lumbar vertebral index (PLVI) was not associated with mortality in univariate or multivariable models. - After adjustment for comorbidities, low PLVI was found to be associated with morbidity (OR 4.91, 95% CI: 2.28-10.60).	Yes
2016 Leepner <i>et al.</i> [30]	23,622 trauma patients were analyzed	CT measured sarcopenia was the strongest predictor of out-of-hospital mortality with a hazard ratio of 4.77 (95% CI: 2.71-8.40; $P < 0.001$).	Yes
2017 Yoo <i>et al.</i> [31]	151 patients > 45 y with trauma and CT abdomen and/or pelvis with intravenous contrast available	- After adjustment with sex-specific cutoffs, the lowest interquartile range of Psoas Index was associated with 90-day mortality (relative risk [RR] 5.95, $P < .008$). - The lowest interquartile range of Hounsfield unit average calculation was associated with 90-day mortality (RR 5.95, $P < 0.008$), duration of stay ≥ 7 days (RR 1.63, $P = 0.048$), complication risk (RR 2.30, $P = 0.002$), and dependent discharge 2.14, $P = 0.015$).	Yes
2017 Couch <i>et al.</i> [32]	554 patients over the age of 65 with trauma	- Multivariate regression analysis showed no significant correlation between MPA and outcomes of mortality ($P = 0.82$) or inpatient complications ($P = 0.22$). - Injury Severity Score (ISS) had a strong association with both mortality (OR 9.5) and inpatient complications (OR 9.9). Age was associated with mortality (OR 1.09) and inpatient complications (OR 1.06).	No
2017 Malekpour <i>et al.</i> [33]	1175 geriatric patients with blunt trauma	- In multivariate analysis, CT measured sarcopenia was associated with a higher risk of in-hospital mortality (OR: 1.61, 95% CI: 1.01-2.56) and a higher risk of discharge to less favorable destinations (OR: 1.42, 95% CI: 1.05-1.97). - Sarcopenic patients had an increased risk of prolonged hospitalization (HR: 1.21, 95% CI: 1.04-1.40).	Yes
2018 Mitchell <i>et al.</i> [34]	146 patients with patients over the age 60 with acetabular fractures	The mortality rate in the sarcopenic cohort was 32.4%, compared with 11.0% in patients without sarcopenia (OR 4.04; 95% CI: 1.62-10.1).	Yes
2018 Hu <i>et al.</i> [35]	108 patients with severe traumatic brain injury	- Bilateral masseter area (MA) was measured 2 cm below the zygomatic arch. Sarcopenia was defined as $MA < 1$ SD of the mean. - Patients with sarcopenia had significantly increased rates of 30-day mortality (80.0% vs. 50.6%; $P = 0.01$). Sarcopenia (OR: 2.95; 95%) and decreasing MA were significantly associated with 30-day mortality (OR: 0.66) in multivariate modeling.	Yes
2018 Mccusker <i>et al.</i> [36]	325 geriatric patients with trauma.	Sarcopenia was defined as the lowest sex-specific-quartile of PMI. On regression analysis, after adjusting for confounding variables and frailty status, sarcopenia was associated with adverse disposition (OR: 1.41, $P = 0.01$), but not associated with in-hospital complications (OR: 1.21, $P = 0.54$) or in-hospital mortality (OR: 1.12, $P = 0.73$).	Yes
2019 Touban <i>et al.</i> [37]	558 elderly trauma patients	Small PMA was associated with increased 1-year mortality in total population (HR: 0.93], $P < 0.0001$). Stratification by gender revealed a statistically significant mortality HR in male patients (HR = 0.89, $P = 0.002$). No statistically significant mortality HR was found in female patients ($P = 0.103$).	Yes
2020 Nishimura <i>et al.</i> [38]	405 patients aged ≥ 65 years old and Injury Severity Scores above 15	Sarcopenia was determined by measuring PMI. Mortality was significantly higher in the sarcopenic group than in non-sarcopenic group (OR, 2.20; $P = 0.027$).	
2020 Bayram <i>et al.</i> [39]	103 patients aged >60 y treated with vertebroplasty or kyphoplasty	The psoas:lumbar vertebral index (PLVI) PLVI was significantly lower in patients who died after surgery.	Yes
2020 Cichos <i>et al.</i> [40]	684 patients with acetabular fracture undergoing external fixation	There was no difference in the mean psoas muscle density between patients with surgical site infection (SSI) and those who did not have an SSI within 1 year of open reduction and internal fixation ($P = 0.69$).	No

2020 Vander Voort <i>et al.</i> [41]	111 patients with operative fixation of open fractures of the tibia or ankle.	The psoas index ($PI = (RPA + LPA) / \text{height}^2 \text{ (cm}^2/\text{m}^2)$) was calculated. Nonunion occurred was associated with sarcopenia (Relative risk = 2.42, $P = 0.0314$). No association was found between sarcopenia and surgical site infection (SSI), BMI, smoking status, ISS, and Gustilo and Anderson (GA) classification of open fracture (all $P > 0.2$).	+/-
2021 Gomindes <i>et al.</i> [42]	111 trauma patients	PMA negatively correlated moderately with age ($r = -0.468, P < 0.001$), Clinical Frailty Scale (CFS) ($r = -0.431, P < 0.001$), and brain frailty ($r = -0.436, P < 0.001$).	Yes
2021 Cho <i>et al.</i> [43]	179 patients after brain injury	The PMI was also statistically significant as a risk factor for mortality in logistic regression analysis ($P = 0.023$; OR: 0.715). Quantitative analyses were performed with the Glasgow outcome scale (GOS) scores. Bivariate correlation analysis showed a statistically significant correlation between PMI and GOS scores (correlation coefficient, 0.168; $P = 0.003$). PMI ($P = 0.004$) was significant in multiple regression analysis.	Yes

Supplemental Table 3. Psoas muscle area and/or attenuation variables and outcome after elective orthopedic surgery			
Year & Reference	Number of patients	Study results	Association (Y/N)
Zakaria <i>et al.</i> [44]	395 patients (lumbar surgery)	<ul style="list-style-type: none"> - No surgery-related characteristics were associated with postoperative morbidity. - Multivariate regression analysis male and female patients with the lowest PMA tertile had an OR of 1.70 (95% CI: 1.04-2.79, $P = 0.035$) for postoperative complications. - Males in the lowest PMA tertile had an OR of 2.42 (95% CI: 1.17-5.01, $P = 0.016$) for postoperative complications. 	Yes
2017 Charest-Morin <i>et al.</i> [45]	102 patients > 65-y, who underwent elective thoracolumbar surgery for degenerative spine disease.	<ul style="list-style-type: none"> - PMAh (PMA indexed to height) did not predict the occurrence of adverse events (AE) (OR: 1.06 per 100 mm²/m², 95% CI: 0.91-1.23, $P = 0.45$). PMAh was not predictive of length of stay ($P = 0.67$), discharge home ($P = 0.70$), or death ($P = 0.47$). - In contrast, increasing modified Frailty Index was associated with increased risk of mortality ($P = 0.006$). 	No
2021 Stanuszek <i>et al.</i> [46]	101 patients with surgical treatment of lumbar disc disease (LDD).	<p>Fatty degeneration of the paraspinal muscles correlated with better outcomes 1 and 6 months postoperatively according to Oswestry Disability Index (ODI) ($P = 0.003$ and $P = 0.027$, respectively).</p> <p>Patients with higher rCSA of the paraspinal and psoas major muscles achieved better results on the EURO EQ-5D scale ($P = 0.0289$ and $P = 0.0089$, respectively). Higher rCSA of the paraspinal and psoas major muscles did not correlate with better outcomes measured using ODI, Core Outcome Measure Index (COMI) and Visual Analog Scale (VAS) ($P \geq 0.072$).</p>	+/-
2021 Hirase <i>et al.</i> [47]	114 patients undergoing complex revision thoracolumbar spine surgery	<p>ROC curve analysis demonstrated PMI < 500 mm²/m² for males and < 412 mm²/m² for females as predictors for perioperative adverse events (AEs).</p> <p>The sarcopenia group had higher overall perioperative AEs (75.5% vs. 27.7%, $P < 0.001$). The sarcopenia group had higher 30-day reoperation rate ($P = 0.037$), 30-day readmission rate ($P = 0.018$), rate of discharge to a facility ($P < 0.001$), and longer length of stay ($P = 0.023$).</p>	Yes
2021 Sheldon <i>et al.</i> [48]	73 patients with back pain undergoing spinal cord stimulation (SCS)	<p>Correlations between psoas muscle CSA (PI), ratio of iliopsoas muscle size to the vertebral body area (P/VBA), and the ratio of iliopsoas muscle size to BMI (P/BMI) were examined.</p> <p>In females, P/VBA predicted worst pain scores ($P = 0.004$) and Beck Depression Inventory (BDI) ($P = 0.02$). In males, P/BMI was a significant predictor of BDI outcomes scores ($P = 0.03$). Males who had more muscle mass measured by iliopsoas size had more depression as measured using BDI ($P = 0.03$). Females with less muscle mass measured by P/VBA also experienced more depression ($P = 0.02$).</p>	Yes
2021 Jung <i>et al.</i> [49]	123 patients who had undergone single-level lateral lumbar interbody fusion	<p>The mean PMI (PMA/height²) was not significantly different between the patients with and without perioperative neurological complications. The PMI was one of the predictors for achieving a substantial clinical benefit (SCB) in men (OR, 1.251; $P = 0.038$) and women (OR, 1.795; $P = 0.023$). The optimal cutoff point of the PMI for an SCB was 8.18 cm²/m² for the men and 4.43 cm²/m² for the women.</p>	Yes
2021 Kim <i>et al.</i> [50]	85 patients with degenerative spinal diseases (DSDs) undergoing spinal surgery	<p>Central sarcopenia was measured by the 50th percentile of psoas: L4 vertebral index (PLVI).</p> <p>Multivariate stepwise regression analysis showed that postoperative complication was significantly associated with surgical invasiveness and K-FRAIL scale. Length of hospitalization was significantly associated with surgical invasiveness and Charlson Comorbidity Index (CCI). K-FRAIL scale showed a significant correlation with CCI and PLVI.</p>	+/-

Supplemental Table 4. Psoas muscle area and/or attenuation variables and outcome after transplantation			
Year & Reference	Number of patients	Study results	Association (Y/N)
2013 Krell <i>et al.</i> [51]	207 liver transplant recipients	- Patients in the lowest PMA tertile had a greater than 4-fold higher chance of developing a severe infection in comparison with patients in the highest tertile (OR = 4.6, 95% CI: 2.25-9.53).	Yes
2014 Lee <i>et al.</i> [52]	325 liver transplant recipients	Dorsal muscle group area is a significant predictor of 1-yr mortality (OR = 0.53, $P = 0.001$), 5-yr mortality (OR = 0.53, $P < 0.001$), and 1-yr complications (OR = 0.67, $P = 0.007$).	Yes
2014 Hamaguchi <i>et al.</i> [53]	200 living donor liver transplant recipients	Multivariate analysis showed that high intramuscular adipocyte content (IMAC) [OR = 3.898, 95% CI: 2.025-7.757, $P < 0.001$] and low psoas muscle index (PMI) (OR = 3.635, 95% CI: 1.896-7.174, $P < 0.001$) were independent risk factors for death.	Yes
Valero <i>et al.</i> [54]	96 patients who underwent resection or liver transplant due to primary liver tumors.	- On multivariable analysis, the presence of sarcopenia was an independent predictive factor of postoperative complications (OR = 3.06). - Sarcopenia was not associated with long-term survival ($P = 0.51$).	Yes
2015 Underwood <i>et al.</i> [55]	348 liver transplant recipients	- PMA as a significant predictor of failure to rescue (FTR) (OR = 0.27 per 1000 mm ² increase in PMA, $P < 0.001$). - Compared to patients in the largest PMA tertile, patients in the smallest tertile had 1.4-fold higher adjusted complication rates (91% vs. 66%) and 2.8-fold higher adjusted FTR rates (22% vs. 8%).	Yes
2015 Jeon <i>et al.</i> [56]	145 liver transplant recipients	- The mean survival duration was not statistically significant in patients with and without sarcopenic patients (log-rank $P = 0.069$). - In subgroup analysis, newly developed sarcopenia was an independent negative predictor for survival (HR: 10.53; $P = 0.024$).	Yes
2016 Terjimanian <i>et al.</i> [57]	348 liver transplant recipients	- PMA is associated with adverse outcome (HR = 0.91 per cm ² , 95% CI: 0.88-0.94; $P < 0.001$). - Among patients with smaller PMA, the patients with high visceral fat area had 58.2% 5-yr survival compared to 36.9% for those with low visceral fat area ($P = 0.023$).	Yes
2016 Weig <i>et al.</i> [58]	103 lung transplant recipients	Lean psoas area (LPA) was inversely associated with requirement of tracheostomy ($P = 0.035$), length of mechanical ventilation ($P = 0.03$), requirement of tracheostomy ($P = 0.035$), and length of stay in the intensive care unit ($P = 0.02$).	Yes
2017 Kalafateli <i>et al.</i> [59]	232 liver transplant recipients	- Psoas muscle index (PMI) was associated with infection (OR = 0.996, 95% CI: 0.994-0.999) and 1-year mortality (OR = 0.996, 95% CI = 0.992-0.999). - Patients at the lowest PMI receiving suboptimal grafts had longer ICU/hospital stay and higher incidence of infections.	Yes
2016 Izumi <i>et al.</i> [60]	47 patients undergoing living liver transplantation.	- Lower PMI was an independent risk factors for the development of postoperative complications. - The 120-day survival rates were significantly lower for the lower PMI group than for the higher PMI group ($P = 0.034$).	Yes
2017 Mathew <i>et al.</i> [61]	144 patients after liver transplant	- The mean PMI for patients with left ventricular systolic function (LVSD) was 298mm ² /m ² compared to 382 mm ² /m ² for those with normal EF ($P = 0.002$). - BMI, MELD score, and etiology of cirrhosis were not significant risk factors for post-LT LVSD. During the study period, 35.2% of LVSD patients died within 1 year after LT. Although LVSD is a rare complication after LT, those with reduced PMI may be at highest risk.	+/-
2017 Hammand <i>et al.</i> [62]	200 patients after adult-to-adult living donor liver transplantation	- Low PMI was associated with postoperative bacteremia and major postoperative complications, and poorer overall survival (OS) ($P < 0.001$). Overweight recipients had a significantly higher overall survival (OS) rate ($P = 0.021$). - The SN subgroup (low PMI and BMI < 25) had higher incidence of postoperative bacteremia ($P < 0.001$), major postoperative complications ($P < 0.001$) than the sarcopenia overweight (SO) subgroup. The SO group had the poorest OS among the subgroups ($P = 0.001$).	Yes
2018 Chae <i>et al.</i> [63]	X patients after adult-to-adult living donor liver transplantation (LDLT)	A PMI decrease $\leq -11.7\%$ between the day before surgery and postoperative day 7 is an independent predictor of patient mortality after LDLT	Yes

2018 Fukuda <i>et al.</i> [64]	41 recipients with severe Type 1DM after PancreasTx	- Sarcopenia was defined as PMI < the first quantile or intramuscular adipocyte tissue IMAC > the third quantile. - Multivariate analyses: high IMAC was independently associated with postoperative surgical complications (OR 9.35; $P = 0.016$). High IMAC showed unfavorable graft survival compared to those with normal IMAC (log-rank test; $P = 0.038$). Low PMI didn't predict postoperative outcomes.	Yes
2018 Kim <i>et al.</i> [65]	92 males after LDLT for treating Hepatocellular CA beyond the Milan criteria	- There was a 9% increase in tumor recurrence risk per unit decrease in height-normalized psoas muscle thickness. 36.1% of the sarcopenic recipients developed tumor recurrence, whereas only 5.0% of the non-sarcopenic recipients developed recurrence. - Recurrence risk was greater in sarcopenic patients in univariable and multivariable analysis (HR 8.06, $P = 0.044$) and (HR 9.49, $P = 0.034$), respectively.	Yes
2018 Noguchi <i>et al.</i> [66]	43 patients underwent pancreas Tx for type 1 DM	- The cumulative graft survival rate was significantly higher in patients with a low PMI ($P = 0.0206$). - Multivariate Cox regression: A low PMI ($P = 0.0075$) is an independent predictive factor for better graft survival. A low PMI was not a significant predictive factor for acute rejection, but was an independent predictive factor for graft survival after the first acute rejection ($P = 0.0025$).	Yes
2019 Aby <i>et al.</i> [67]	146 before orthotopic liver transplant (OLT).	PMA was measured to define sarcopenia. No significant differences in length of initial hospitalization following OLT, survival at 1 year, and overall survival between sarcopenic and nonsarcopenic patients.	No
2018 Dolgin <i>et al.</i> [68]	136 adult, first-time liver transplant	71.3% of patients demonstrated declined PMA at an average rate of 11% per month. Patients who experienced muscle wasting at a rate of $\geq 1\%$ per month had 2.83 times the risk of being severely impaired/disabled pretransplant. The risk increased by 2.32-fold for every standard deviation decrease in pretransplant PMA.	Yes
2018 Hsu <i>et al.</i> [69]	95 patients with primary lung transplantation	Sarcopenia, measured by PMA, was significantly associated with short-term and midterm mortality on multivariate analysis (1 year: OR, 8.7, $P = 0.017$; 2 years: OR, 12.7, $P < 0.01$; 3 years: OR, 13.4, $P < 0.01$). Survival analysis showed significantly decreased survival in sarcopenic patients at 3 years (35.9% versus 76.8%; $P < 0.01$). Sarcopenia is associated with decreased forced expiratory volume in 1 second ($P = 0.03$). Adjusted Cox analysis showed an increased hazard for all-cause mortality (HR 5.8, $P < 0.01$) and graft failure (HR 14.7, $P < 0.01$) in sarcopenic patients.	Yes
2019 Suh <i>et al.</i> [70]	107 patients who underwent double lung transplantation	Psoas muscle mass (PMM) was used to determine sarcopenia. Patients with sarcopenia showed a trend toward poorer outcome, but it was not significant ($P = 0.054$). Moreover, PMM was significantly associated with the length of mechanical ventilation ($P = 0.047$) and length of intensive care unit stay ($P = 0.046$). Overall survival was significantly lower among patients with sarcopenic overweight than among those without sarcopenia ($P = 0.026$ and $P = 0.024$, respectively).	+/-
2019 Esser <i>et al.</i> [71]	172 patients on a waitlisted for liver transplantation	Sarcopenia revealed by low muscle density correlates with major complications following LT and acts as an independent predictor for patient and graft survival.	Yes
2020 Pinto Dos Santos <i>et al.</i> [72]	368 patients after orthotopic liver transplantation (OLT)	The PSMI predicted one-year posttransplant mortality (ROC curve: AUC of 0.671, $P < 0.001$) in male patients and outperformed individual psoas and erector spinae muscle group assessments in this regard.	Yes
2020 Alconchel <i>et al.</i> [73]	57 patients after liver transplantation	- Multivariate analysis: a positive correlation between the PMI and the BMI of the recipients ($r = 0.32$, $P = 0.017$), intensive care unit length of stay, and donor age ($r = 0.319$, $P = 0.042$), and between cold ischemia time and graft survival ($r = 0.366$, $P = 0.009$) was. - No correlation in our sample between PMI and post-liver transplant complications either in terms of graft or patient survival was found.	No
2020 Cabo <i>et al.</i> [74]	97 patients after liver transplantation	The incidence of postoperative complications (Clavien ≥ 3) in patients with and without sarcopenia, determined by sex adjusted PMA, was 39.5% and 24.1%, respectively ($P = 0.08$). Sarcopenia was not associated with poorer long-term graft or patient survival.	+/-

2020 Park <i>et al.</i> [75]	610 adults who underwent elective Living Donor Liver Transplantation (LDLT)	Multivariate analysis revealed that PMI was independently associated with the risk of early post-transplant bacteremia (AUC: 0.707; $P < 0.001$). The overall survival rate was better in the non-infected patient group.	Yes
Kumar <i>et al.</i> [76]	115 patients after living donor liver transplantation due to cirrhosis.	Ninety-day mortality was comparable between sarcopenics (9.09%) and nonsarcopenics (6.6%) ($P = 0.63$). Skeletal muscle index (SMI) was a predictor of 90-day mortality (OR: 0.83; $P = 0.016$)	Yes
2020 Crombé <i>et al.</i> [77]	141 recipients of simultaneous pancreas and kidney (SPK) transplants	A multivariate Cox regression analysis showed that patients with a low PMI were 6 times more likely to lose their pancreas allograft (HR; 5.; $P = 0.015$). Among low PMI patients who had a follow-up CT scan, 62.5% of those with a functional pancreas graft either improved or resolved sarcopenia, whereas 75.0% of those who lost their pancreas graft continued to lose muscle mass.	Yes
2020 Dhaliwal <i>et al.</i> [78]	57 patients undergoing liver re-transplantation (re-OLT)	47% of patients who underwent re-OLT had sarcopenia, determined by measuring PMA. Females were found to have significantly more sarcopenia than males ($P < 0.001$). Median model for end stage liver disease at re-OLT was 28 in both sarcopenia and no sarcopenia groups. Patients in the no sarcopenia group had a trend of longer median time between the first and second transplant (36.5 mo vs. 16.7 mo).	No
2021 Malamutmann <i>et al.</i> [79]	265 patients after liver transplantation	Multivariable analysis: the values for psoas muscle size and the PMI of the recipient were associated as independent factors for postoperative complications and duration of hospital stay. Independent factors associated with survival after liver transplant were inner abdominal fat tissue, etiology, and rate of major postoperative complications.	Yes
2021 Mazzola <i>et al.</i> [80]	79 patients undergoing simultaneous liver and kidney transplantation (SLKT)	Sarcopenia threshold was PMA $< 1460 \text{ mm}^2$ (women) and $< 1560 \text{ mm}^2$ (men). No difference in patient or death-censored graft-survival between sarcopenic and non-sarcopenic groups at 1 year was reported. Also, no differences at 6-months' post-transplant-complication-free and infection-free-survival rates were found.	No.
2021 Yoshida <i>et al.</i> [81]	113 patients before allogeneic hematopoietic stem cell transplantation (allo-HSCT)	Multivariable logistic analysis showed that older age (OR: 2.45, $P = 0.04$), male (OR: 4.35, $P = 0.04$), and low BMI (OR = 0.83, $P = 0.02$) were independent risk factors for low PMI before HSCT. Only age (≤ 50 years) was significantly associated with muscle quality (modified OR = 0.07, CI: 0.00-0.43, $P < 0.01$) in univariate analysis.	Yes
2021 Wu <i>et al.</i> [82]	271 living-donor liver transplant (LDLT) recipients	Female recipients with major postoperative complications had significantly lower mean PMI values ($P = 0.028$), and the PMI cut-off value was $2.63 \text{ cm}^2/\text{m}^2$. Postoperative massive pleural effusion requiring drainage happened more frequently in the sarcopenia group ($P = 0.003$). 1-, 3-, 5- and 10-year overall survival rates in female were significantly poorer in the sarcopenia group compared with the non-sarcopenia group in females ($P = 0.041$).	Yes
2021 Tsao <i>et al.</i> [83]	138 living donor liver transplant (LDLT) recipients	Prognostic nutrition index (PNI) and PMI were associated with mortality at three months post-LDLT (PNI-3m HR: 0.89; $P < 0.001$; PMI-3m HR = 0.58; $P = 0.002$). Per the Youden index, the cut-off point of PNI-3m was 42.35, and that of PMI-3m was 1.94. Compared to the subjects with higher levels of PNI-3m and PMI-3m (N-high/M-high), the HRs for subjects with N-high/M-low, N-low/M-high, and N-low/M-low were 5.27 ($P = 0.004$), 4.46 ($P = 0.010$) and 12.97 ($P < 0.001$) respectively.	yes

Supplemental Table 5. Psoas muscle area and/or attenuation variables and outcome after major non-cardiovascular and non-oncological surgery			
Year & Reference	Number of patients	Study results	Association (Y/N)
2016 Onesti <i>et al.</i> [84]	270 patients after pancreas resection	<ul style="list-style-type: none"> - LPMA was predictive of discharge destination for females ($P = 0.038$). Males in the lowest LPMA had a higher re-admission rate. - Males in the lowest LPMA tertile, including the subset with adenocarcinoma, were more likely to die than patients in the highest LPMA tertile (HR: 2.6; 95% CI: 1.4-4.8 and HR: 2.4; 95% CI: 1.2-4.9, respectively). 	Yes
2016 Jaap <i>et al.</i> [85]	180 patients after pancreatectomy	<ul style="list-style-type: none"> - Of the individual CT measured morphometric variables examined, sarcopenia was the best predictor of length of stay and surgical complications. - On multivariate analysis, there was a statistically significant correlation of sarcopenia with surgical complications (OR = 3.524, $P = 0.0049$). No other morphometric variables predicted morbidity. 	Yes
2017 Matsushima <i>et al.</i> [86]	89 patients with emergency operation for acute diverticulitis	<ul style="list-style-type: none"> - PMA and TVD (transverse psoas diameter) were used to determine low muscular mass (LMM). - Univariable analysis: significantly higher rates of postoperative major complications (63% versus 37%, $P = 0.027$) and surgical site infection (47% versus 19%, $P = 0.008$) were identified in the LMM group. - After adjusting for relevant covariates, patients with LMM were significantly associated with higher major complications and surgical site infection rates. 	Yes
2018 Yeh <i>et al.</i> [87]	140 surgical intensive care unit patients	<ul style="list-style-type: none"> - There was no significant correlation between baseline PMA and HU and clinical outcomes. - Patients with the greatest daily %HU decline received significantly fewer calories/kg and proteins/kg and accumulated greater protein deficits at day 7 and overall. - Patients with daily %HU increase had the shortest ICU and hospital LOS and more ventilator-free days in univariate and multivariable analyses. 	Yes
2018 Gaillard <i>et al.</i> [88]	205 patients after Sleeve gastrectomy.	After multivariate analysis, preoperative weight (OR = 1043) and sarcopenia (MPA) (OR = 5204) were independent predictive factors for gastric leak.	Yes
2018 Lo <i>et al.</i> [89]	100 patients after enterocutaneous fistula repair	The lowest HUAC interquartile was defined as low muscle quality (LMQ) cutoff, which was associated with 1-year leak (relative risk [RR] = 2.10, $P < 0.005$), 1-year mortality (RR = 2.22, $P < 0.04$) and 3-year mortality (RR = 2.13, $P < 0.007$), complication risk (RR = 1.54, $P < 0.001$), and dependent discharge (RR = 2.50, $P < 0.004$) compared to patients without LMQ.	Yes
2018 Tankel <i>et al.</i> [90]	61 patients after elective pancreaticoduodenectomy (PD).	Significantly more sarcopenic (defined by PMA) patients suffered from delayed gastric emptying (DGE) ($P = 0.045$). On multivariate analysis, sarcopenia remained associated with DGE.	Yes
2018 Barnes <i>et al.</i> [91]	58 patients undergoing ventral hernia repair (VHR)	<ul style="list-style-type: none"> - Sarcopenia was defined as an HUAC score of less than 19.6 HU calculated using receiver operating characteristic (ROC) analysis. - Preoperative sarcopenia was associated with an increased risk for postoperative complications (OR = 5.3; $P = 0.04$). A significantly higher rate of hernia recurrence (33.3% vs. 10.8% [$P = 0.04$]) and renal failure (19% vs. 2.7% [$P = 0.03$]) was noted in patients with sarcopenia when compared to patients without sarcopenia. 	Yes
2020 Schlosser <i>et al.</i> [92]	1178 patients undergoing open ventral hernia repair (OVHR)	Sarcopenia (PMA indexed to height) was associated with outcomes of wound infection, readmission, reoperation, hernia recurrence, or major complications. are not associated with adverse outcomes after OVHR.	No
2020 Xu <i>et al.</i> [93]	152 consecutive patients who underwent open pancreatoduodenectomy	Total psoas area index (TPAI) was calculated. In multivariate logistic regression, rate of major complications was associated with TPAI (OR = 0.605, $P = 0.009$), TPAI-defined sarcopenia (OR = 8.256, $P = 0.000$) and sarcopenic overweight/obesity (OR = 7.462, $P = 0.002$).	Yes

Supplemental Table 6. Psoas muscle area and/or attenuation variables and outcome after oncologic surgery			
Year & Reference	Number of patients	Study results	Association (Y/N)
2012 Peng <i>et al.</i> [94]	557 (pancreatic surgery)	- Sarcopenia predicts survival after pancreatic surgery, with sarcopenic patients having a 63 % increased risk of death at 3 years.	Yes
2013 Sheetz <i>et al.</i> [95]	230 (esophagectomy)	- LPA correlated with both overall survival (OR) ($P = 0.017$) and disease-free survival (DFS) ($P = 0.038$). - In multivariable analysis including tumor characteristics, LPA correlated with OS and DFS. - Higher LPA associated with improved OS and DFS.	Yes
2014 Smith <i>et al.</i> [96]	220 (total cystectomy)	- An association was noted between major complications and lower PMA in women using a cutoff of 523 cm ² /m ² to define sarcopenia. - No significantly association between sarcopenia and complications in men. - There was a nonsignificant trend of sarcopenia with worse 2-year survival.	Yes
2015 Kuroki <i>et al.</i> [97]	122 patients, that underwent surgery of endometrial cancer	- Patients with sarcopenia had a shorter recurrence-free survival than nonsarcopenic patients (log-rank $P = 0.02$) but did not differ in terms of overall survival (log-rank $P = 0.25$). - After adjustment for race, BMI, lymphocyte count, and tumor histology, sarcopenia was associated with a fourfold shorter recurrence-free survival (adjusted hazard ratio [HR _{adj}] = 3.99).	Yes
2015 Joglekar <i>et al.</i> [98]	118 patients (pancreatectomy for adenoCA)	Sarcopenia (defined by psoas muscle CT attenuation averaging) was an independent predictor of major complications, length of stay, intensive care unit admission, delayed gastric emptying, and infectious, gastrointestinal, pulmonary, and cardiac complications.	Yes
2015 Otsjui <i>et al.</i> [99]	256 patients (major hepatectomy with extrahepatic bile duct resection)	- The postoperative hospitalization duration was longer for patients with sarcopenia than for those without sarcopenia ($P < 0.001$). - Patients with sarcopenia experienced a significantly higher rate of liver failure (33 vs. 16%), major complications with Clavien grade ≥ 3 (54 vs. 37%), and intra-abdominal abscess (29 vs. 18%) than those without sarcopenia (all $P < 0.05$). - Low normalized TPA (male < 567 mm(2)/m(2); female < 395 mm(2)/m(2)) was identified as an independent risk factor for the development of liver failure (odds ratio 2.46).	Yes.
2015 Okumura <i>et al.</i> [100]	230 patients (resection of pancreatic cancer)	Low PMI (low muscle mass) and high IMAC (low muscle quality) were independent predictors of poor (OR) overall survival (HR = 1.999, $P < 0.001$; HR = 2.527, $P < 0.001$) and recurrence-free survival (RFS) (HR = 1.607, $P = 0.007$; HR = 1.640, $P = 0.004$), respectively.	Yes
2015 Amini <i>et al.</i> [101]	763 patients (pancreatectomy for pancreatic adenoCA)	- PMA-sarcopenia was not associated with higher risk of postoperative complications (OR 1.06; $P = 0.72$), sarcopenia defined by TPV (total psoas volume) was associated with morbidity (OR 1.79; $P = 0.002$). - Multivariable analysis, TPV-sarcopenia remained an independent predictor of postoperative complications (OR 1.69; $P = 0.006$), as well as long-term survival (HR 1.46; $P = 0.006$).	Yes
2016 Kobayashi <i>et al.</i> [102]	241 patients (primary hepatectomy for hepatocellular CA)	High Δ IMAC at 6 months after hepatectomy (OR = 3.713; $P = 0.024$) were the risk factors for tumor recurrence in patients with preoperative normal IMAC	Yes
2016 Okumura <i>et al.</i> [103]	207 patients (resection of extrahepatic biliary malignancies)	- Low PMI and high IMAC were independent predictors of poor OS (HR: 2.921; $P < 0.001$) and HR: 1.725; $P = 0.007$), respectively. and RFS (HR, 2.141, $P < 0.001$) and HR, 1.492; $P = 0.034$).	Yes
2016 Boer <i>et al.</i> [104]	91 patients after open colorectal resection	- Sarcopenic obesity (PMA Hounsfield units) was an independent risk factor for severe complications (all $P \leq 0.008$). - Sarcopenia was an independent predictor of worse overall survival (HR 8.54; 95% CI: 1.07-68.32).	Yes
2016 Onesti <i>et al.</i> [105]	60 patients (laparoscopic colorectal resection for primary colorectal CA)	No significant differences in total postoperative complications (20% vs. 20%) or major postoperative complications of Clavien-Dindo Grade \geq III (5% vs. 5%) were found between the patients in the sarcopenia and non-sarcopenia groups.	No

2017 Park <i>et al.</i> [106]	131 patients (surgical resection and lymph node dissection for esophageal CA)	<ul style="list-style-type: none"> - PMA is an adverse risk factor for overall survival (OS) (HR = 0.93; $P = 0.004$), whereas BMI was related to OS. - The 3-year OS rates were 64.9% in high-PMA patients; however, it was only 37.1% in low-PMA patients ($P = 0.002$). 	Yes
2017 Hervochon <i>et al.</i> [107]	161 patients with non-small cell lung cancer (NSCLC) requiring pneumonectomy	<ul style="list-style-type: none"> - BMI and total PMA were strongly and directly correlated ($P < 0.001$). - Sarcopenia (PMA $\leq 33^{\text{rd}}$ percentile) was associated with high CRP levels (> 20 mg/L) ($P = 0.010$). - At univariate analysis, long-term outcome was negatively affected by PMA $< 33^{\text{rd}}$ percentile ($P = 0.029$). - Multivariate analysis: PMA is an independent prognostic factor. 	Yes
2017 Otsuji <i>et al.</i> [108]	254 patients (major hepatectomy with extrahepatic bile duct resections).	<ul style="list-style-type: none"> - The incidence rates of complications and mortality were all significantly higher in the group with CT measured PMA surgery-related muscle loss (SML) than in the group without SML. - Multivariate analyses: SML is an independent predictor of major complications (OR 3.21; 95% CI: 1.82-5.76, $P < 0.001$). 	Yes
2016 Nagata <i>et al.</i> [109]	42 patients (surgery for stage 4 colorectal CA)	<ul style="list-style-type: none"> - PMI was significantly associated with 3-year overall survival OS in univariate (high vs. low PMI: 43.0% vs. 12.9%, $P = 0.0415$) and multivariate ($P = 0.0146$) analyses. - A low PMI was associated with a shorter period of chemotherapy. A reduction in PMI was a predictor of a poor prognosis. 	Yes
2017 Delitto <i>et al.</i> [110]	72 patients with resectable pancreas CA	<ul style="list-style-type: none"> - On multivariate analysis, the PMI was the only independent predictor of survival (HR 0.021; $P = 0.003$). - Rapid decreases in the PMI during neoadjuvant chemotherapy were associated with poor postoperative outcomes. 	Yes
2016 Zarger <i>et al.</i> [111]	Patients undergoing chemotherapy and radical cystectomy	<ul style="list-style-type: none"> - Post neo-adjuvant chemotherapy (post-NAC), psoas muscle volume (PMV) and BMI declines were statistically significant, 4.9% and 0.05%, respectively. - NAC dose reduction/delay was a significant predictor of PMV loss (coefficient B 4.6; $P = 0.047$). The proportion of PMV decline during NAC was not a predictor of complications, readmission, recurrent-free survival (RFS), or overall survival (OS). 	Yes
2017 Hanaoka <i>et al.</i> [112]	133 patients with colorectal CA with primary tumor resection	<ul style="list-style-type: none"> - CT measured morphological change of psoas muscle (MPM) was used. 21.1% of the subjects were classified into severe MPM (defined as MPM grade 3-4). - Severe MPM (OR 2.71, 95% CI: 1.09-6.73) was an independent predictor of overall complications and infectious complications (OR 4.26, 95% CI 1.38-13.10). 	Yes
2017 Miyake <i>et al.</i> [113]	89 patients after curative radical cystectomy due bladder cancer	<ul style="list-style-type: none"> - Multivariate analyzes showed that sarcopenia at baseline (HR 2.2, $P = 0.03$) and a $\leq -10\%$ loss in the psoas muscle (HR 2.4, $P = 0.02$) were identified as independent prognostic factors for overall survival. - Loss psoas muscle $\leq -10\%$ (HR 2.6, $P = 0.03$) and reduction change ≤ -5 in the Prognostic Nutritional Index (HR 3.6, $P = 0.01$) were associated with adverse outcome. 	Yes
2017 Mirkin <i>et al.</i> [114]	39 patients with resected gastric cancer.	<ul style="list-style-type: none"> Patients with sarcopenia (CT measured PMA) were more likely to have post-operative complications ($P = 0.05$). There was no significant difference in hospital stay ($P = 0.7402$) or survival ($P = 0.2317$). 	Yes
2017 Yuri <i>et al.</i> [115]	182 patients with hepatocellular CA (percutaneous radiofrequency ablation (RFA))	<ul style="list-style-type: none"> - The 5-year cumulative overall survival OS rates were 51.5% in the decreased PMI group and 86.5% in the non-decreased PMI group ($P < 0.0001$). - In the multivariate analysis, decreased PMI ($P < 0.0001$) was an independent predictor of OS. 	Yes
2017 Saitoh-Maeda <i>et al.</i> [116]	63 patients undergoing radical cystectomy for their bladder cancer	<ul style="list-style-type: none"> In male patients, those hospitalized longer showed a significantly smaller psoas muscle index (PMI) than those normally discharged ($P = 0.04$). Male patients with a small PMI (< 400) had a poorer overall survival ($P = 0.02$) than those with a large PMI (≥ 400). 	Yes
2017 Nagata <i>et al.</i> [117]	77 patients undergoing laparoscopy-assisted gastrectomy (LAG) for gastric cancer	<ul style="list-style-type: none"> - The ratio of PMA to trunk area was defined as the Psoas and All trunk Ratio (PandA Ratio) and used as an index of the balance between muscle and adipose tissue. - The PandA Ratio was significantly lower in patients with complications in univariate (2.76% versus 3.66%, $P < 0.0001$) and multivariate ($P = 0.0064$) analyses. A low PandA Ratio was associated with more severe complications in males. 	Yes

2018 Lu <i>et al.</i> [118]	221 patients: radical gastrectomy due to gastric cancer	<ul style="list-style-type: none"> - The univariate analysis showed that low MPA, low HUAC (Hounsfield Units average count), and low TPG (= MPA x HUAC) were predictors of overall survival (OS), recurrence-free survival (RFS), and cancer-specific survival (CCS) after surgery. - Multivariate analysis demonstrated that low TPG was an independent risk factor for OS, RFS, and CCS. Moreover, the prognostic value of TPG was superior to that of TPA and HUAC. - Low TPG was associated with more postoperative liver recurrence ($P = 0.011$). 	Yes
2017 Namm <i>et al.</i> [119]	116 patients after pancreaticoduodenectomy (PD) for malignancy	<ul style="list-style-type: none"> - Lower MPA index (PMI) was protective against the risk of organ/space surgical site infection (SSI) including pancreatic fistula (OR 3.12, $P = 0.019$). - On multivariate analysis, the semi-automated measurements of PMI and PMA Hounsfield units (HU) remained as independent predictors of organ/space SSI including pancreatic fistula (OR 4.23, $P = 0.014$). 	Yes
2018 Umetsu <i>et al.</i> [120]	65 patients after pancreaticoduodenectomy (PD) for distal cholangiocarcinoma (DCC)	<ul style="list-style-type: none"> - Long-term oncological outcomes: Lower recurrence rates (23.5% versus 58.3%, $P = 0.011$) were observed in the high PMI group. The recurrence-free survival and disease-specific survival were longer in the high PMI group ($P = 0.023$ and $P = 0.043$, respectively). - On multivariate analyses, low PMI was an independent predictor of recurrence (HR: 11.06; $P = 0.022$). 	Yes
2018 Conrad <i>et al.</i> [121]	102 women with stage III-IV epithelial ovarian cancer (EOC)	<ul style="list-style-type: none"> - PMA was normalized to height² to determine CMI. - Sarcopenia was not associated with short-term morbidity or time to recurrence. Sarcopenia was associated with nearly a fourfold increased risk of death when hypoalbuminemia was present ($P = 0.02$). 	Yes
2018 Wagner <i>et al.</i> [122]	424 patients undergoing pancreatic resections for malignancies.	Median HUAC was 19.78 HU with 145 patients (34.2%) having low skeletal muscle mass (LSMM). Preoperative LSMM was associated with an increased risk for postoperative complications (OR 1.55, $P = 0.014$), and a higher 30-day mortality (HR 5.17, $P = 0.004$). With an AUC of 0.85 HUAC showed the highest predictability for 30-day mortality ($P = 0.0001$). Patients with a Charlson Comorbidity Index (CCI) ≥ 6 and LSMM had a 9.78 higher risk of dying in the immediate postoperative phase (HR 9.78, $P = 0.0001$).	Yes
2018 Nakamura <i>et al.</i> [123]	328 patients with pathologically confirmed NSCLC who underwent curative resection	<ul style="list-style-type: none"> - Sarcopenia was defined as a cutoff value of PMI less than 6.36 cm²/m² for males and 3.92 cm²/m² for females, based on PMI values from "healthy" subjects - Sarcopenia was significantly related with postoperative major complication ($P = 0.036$). The 5-year survival rate was 61% and 91% in patients with and without sarcopenia and 91%, respectively. Multivariate analysis showed that sarcopenia was an independent unfavorable prognostic factor ($P = 0.019$). 	Yes
2018 Okugawa <i>et al.</i> [124]	308 patients with colorectal cancer	Preoperative sarcopenia was an independent prognostic factor for both cancer-specific survival (HR: 2.75, $P = 0.001$) and disease-free survival (HR: 3.15, $P = 0.0001$), and was an independent risk factor for postoperative infectious complications (OR: 2.03, $P = 0.013$).	Yes
2018 Tamagawa <i>et al.</i> [125]	82 elderly patients undergoing colectomy for colorectal cancer	<ul style="list-style-type: none"> - PMA measured sarcopenia is associated with a higher incidence of total complications (55 vs. 31.0%, $P = 0.028$) and longer hospital stay (25.9 vs. 18.2 days, $P = 0.039$). - The multivariate logistic analysis revealed that sarcopenia was an independent risk factor for postoperative surgical complications. 	Yes
2018 Chakedis <i>et al.</i> [126]	117 patients with biliary tract cancer (BTC) with curative-intent resection.	Sarcopenia, using PMI, was associated with an increased risk of death among patients who underwent resection (HR 3.52, $P = 0.002$), which was comparable to patients with unresectable metastatic disease. Low psoas density (HR 2.96, $P = 0.017$) was associated with increased risk of death.	Yes
2018 Nagata <i>et al.</i> [127]	123 patients undergoing esophagectomy for esophageal cancer	<ul style="list-style-type: none"> - There was a significant reduction in the PMI 6 months after surgery compared to the preoperative value. - The incidence of pneumonia as of 6 months after surgery was higher in patients a larger reduction of PMI during 6 months after surgery ($P = 0.03$). - Multivariate analysis demonstrated that age and postoperative PMI reduction were independently associated with the incidence of pneumonia 6 months after surgery (HR = 2.92, 95%, $P = 0.02$; HR = 3.25, $P = 0.03$, respectively). 	Yes
2019 Shichinohe <i>et al.</i> [128]	483 patients undergoing esophagectomy for esophageal cancer	Using a preoperative nutritional and muscular (PNM) score derived from BMI and PMI results, male patients were categorized as high risk, moderate risk, or low risk. In the low-risk group, anastomotic leakage was significantly less	+/-

		($P = 0.01$), and the 3-year OS was significantly better ($P < 0.01$). Neither BMI nor PMI was a significant factor for postoperative outcomes.	
2019 Herrod <i>et al.</i> [129]	169 patients having a resection for colorectal cancer	Sarcopenia, measured by psoas muscle density (PMD) was associated with an increased risk of Clavien-Dindo grade 3-4 complications [adjusted OR 6.33, $P = 0.007$]. Sarcopenia was associated with an increased risk of anastomotic leak (adjusted OR 14.37, $P = 0.026$).	Yes
2019 Yugawa <i>et al.</i> [130]	61 patients undergoing surgery for ICC (intrahepatic cholangiocarcinoma)	Five-year overall survival rates were 72.5% and 17.6% and 5-year recurrence-free survival rates were 58.6% and 21.1%, respectively, in high- and low- skeletal muscle mass (SMM) patients. Multivariable analysis: low SMM predicts unfavorable prognoses. SMM was associated with immune nutritional status.	Yes
2019 Yassaie <i>et al.</i> [131]	53 patients undergoing neoadjuvant therapy followed by open two-stage oesophagectomy	Patients who had a decrease of PMA of more than 4% had significantly increased 30-day mortality compared to those who lost 4% or less (24% versus 0%, $P = 0.02$). Patients > 65 years who also had a loss of TPA > 4% had significantly increased 30-day mortality (37% versus 2.9%, OR 19, $P = 0.008$).	Yes
2019 Dolan <i>et al.</i> [132]	163 patients: elective curative colorectal resection for cancer	Sarcopenia, measured by indexing PMA to height, was defined as $< 524 \text{ mm}^2/\text{m}^2$ in males and $385 \text{ mm}^2/\text{m}^2$ in females. In univariate analysis, American Society of Anesthesiologists grade ($P = 0.016$), tumour stage ($P = 0.018$) and sarcopenia ($P = 0.043$) were found to be significant independent predictors of 1-year mortality.	Yes
2019 Fukuoka <i>et al.</i> [133]	74 patients undergoing potentially curative surgery for LARC with neoadjuvant therapy	A > 10% decrease in the PMI value was associated with shorter OS and RFS. The decrease in PMI after neoadjuvant therapy was an independent negative prognostic factor for patients undergoing neoadjuvant therapy for LARC.	Yes
2019 Loosen <i>et al.</i> [134]	56 Patients undergoing Transarterial Chemoembolization (TACE) for Hepatic Malignancies.	Patients with a pre-interventional PMI below our ideal cut-off value of $13.39 \text{ mm}^2/\text{m}^2$ had a significantly impaired long-term outcome with a median overall survival of 491 days compared to 1291 days for patients with a high PMI. This finding was confirmed by uni- and multivariate Cox-regression analyses.	Yes
2019 Ishida <i>et al.</i> [135]	165 esophageal cancer patients who had undergone neoadjuvant chemotherapy followed by esophagectomy	Pre-neoadjuvant chemotherapy PMI (low versus high) was associated with neoadjuvant chemotherapy response (response rate: 65.1% vs 80.3%; $P = 0.0494$) and neoadjuvant chemotherapy-related adverse events (neutropenia, $P = 0.0337$; febrile neutropenia, $P = 0.0278$). Post-neoadjuvant chemotherapy psoas muscle index correlated with postoperative rate of complications ($P = 0.0046$), especially pneumonia ($P = 0.0008$). Psoas muscle index was not associated with survival.	Yes
2020 Madariaga <i>et al.</i> [136]	130 patients undergoing pneumectomy for lung cancer.	CT measured Thoracic skeletal muscle area (TSMA) experienced fewer overall (OR: 0.87; $P = 0.04$) and cardiopulmonary (OR, 0.86; $P = 0.04$) complications, and fewer readmissions (OR, 0.78; $P = 0.01$). Associations with ICU LOS (HR 1.08; $P = 0.051$) and hospital LOS ($P = 0.18$) did not reach significance.	Yes
2019 Shi <i>et al.</i> [137]	279 gastric cancer patients undergoing gastrectomy	Patients with sarcopenia also had an extended postoperative stay (PMI-sarcopenia, 15.0 days vs. non-sarcopenia, 11.0 days, $P < 0.001$) and hospital stay (PMI-sarcopenia, 22.5 days vs. non-sarcopenia, 17.0 days, $P < 0.001$). Multivariate logistic analysis showed that both TPI-sarcopenia (OR 7.561, $P < 0.001$) was associated with the risk of postoperative complications. Univariate analysis showed a high correlation between nutrition risk screening 2002 and sarcopenia ($P < 0.001$).	Yes
2020 Menezes <i>et al.</i> [138]	80 patients undergoing esophagectomy and gastrectomy	No statistically significant difference was found between the presence of muscle depletion (PMA and Muscle Mass Index (MMI)) and complications.	No
2020 Shinohara <i>et al.</i> [139]	391 NSCLC patients who had undergone lung cancer resection	Multivariate analysis showed that sarcopenia, by measuring PMA, was an independent unfavorable prognostic factor associated with OS and recurrence-free survival (HR: 3.33, $P < 0.001$; HR: 2.76, $P < 0.001$, respectively). Regarding the incidence of postoperative complications, there was no difference between sarcopenic and nonsarcopenic patients ($P = 0.19$).	Yes
2020 Richards <i>et al.</i> [140]	350 Patients undergoing elective resection of colorectal cancer	Sarcopenia, determined by PMA indexed to height, was associated with a significantly increased length of stay (OR, 1.31; $P < 0.01$) and 1-year mortality (OR, 16.2; $P < 0.01$). Sarcopenia was also associated with a significant increased risk of any complication (OR, 15.4; $P < 0.01$) and of major complications (OR, 15.1; $P < 0.01$).	Yes

2020 Golse <i>et al.</i> [141]	186 patients operated with major hepatectomy for perihilar tumors	PMA/height ² was a predictor for severe morbidity but not for mortality	Yes
2020 Yeh <i>et al.</i> [142]	136 early-stage hepatoma (HCC) patients undergoing radiofrequency ablation	PMI was used to define sarcopenia. Multivariate analysis showed pre-sarcopenia (HR: 2.110; <i>P</i> = 0.026) was the only factor significantly associated with overall survival (OS), but not with HCC recurrence.	Yes
2020 Zakaria <i>et al.</i> [143]	271 patients who had undergone surgery for spinal metastasis were identified.	Patients in the smallest PMA had shorter overall survival compared to the middle and largest tertile. PMA predicted overall mortality more strongly than the Karnofsky Performance Status (KPS). PMA predicted 90-d mortality more strongly than KPS. Patients with a larger PMA were more likely to have an improvement in deficit compared to the middle tertile. PMA failed predicting 30-d morbidity.	Yes
2020 Abbass <i>et al.</i> [144]	1002 patients who underwent colorectal surgery	On univariate analysis, low PMI was associated with length of hospital stay (OR, 1.34; <i>P</i> < 0.05) and overall survival (OR, 1.43; <i>P</i> < 0.01). On multivariate analysis, low PMI was not independently significant. Skeletal muscle index (SMI) was a predictor of length of hospital stay (HR 1.32; <i>P</i> < 0.05).	Yes
2021 Fujihata <i>et al.</i> [145]	99 patients with thoracic esophageal cancer and esophago-gastric junctional cancer receiving neo-adjuvant chemotherapy	For assessing the extent of skeletal mass wasting (SMW), the rate of change in skeletal muscle mass index (SMI) was used. Multivariate analysis showed a decreased rate in SMI was significantly associated with Grade IIIa of higher anastomotic leakage (Grade ≥ IIIa) (SMI cutoff (favorable): ≤ -7.84, <i>P</i> = 0.004).	Yes
2021 Fujishima <i>et al.</i> [146]	123 patients who had undergone esophagectomy for esophageal cancer	The decrease in psoas muscle volume (PI) at 6 months after surgery was significant in patients with and without postoperative pneumonia (-9.9% vs. 2.6%). Overall survival was significantly poorer in patients with postoperative pneumonia than in those without pneumonia (<i>P</i> < 0.05).	Yes
2020 Martini <i>et al.</i> [147]	234 patients patients with pneumonectomy	Total Psoas Area (TPA), cross-sectional Total Muscle Area (TMA), and Total Parietal Muscle Area (TPMA), defined as TMA without TPA. Acute Respiratory Failure (ARF), Acute Respiratory Distress Syndrome (ARDS), and 30-day mortality were assessed as parameters of short-term-outcome. All parameters describing sarcopenia gave significant results; the best discriminating parameter was TMA after excluding fat (<i>P</i> < 0.001). While right sided pneumonectomy and sarcopenia were independently associated to the three short-term outcome parameters.	Yes
Taniguchi <i>et al.</i> [148]	567 consecutive patients with gastric cancer who underwent gastrectomy	PMI and visceral fat area (VFA) were useful predictive factors for postoperative pneumonia and intra-abdominal abscess, respectively. PMI might be a useful prognostic factor in patients with gastric cancer, but VFA is not.	Yes
2021 Tang <i>et al.</i> [149]	77 patients undergoing esophagectomy	The Esophageal Vitality Index, an objective, simple assessment consisting of grip strength, 30-second chair sit-stands, 6-minute walk, and PMA to height ratio outperformed commonly used frailty indexes in predicting postesophagectomy mortality and morbidity.	Yes
2021 Taki <i>et al.</i> [150]	257 gastric cancer patients with clinical stage I, II, or III who underwent gastrectomy at age 75 years or more	CT skeletal muscle index (SMI), PMA, intramuscular adipose tissue content in multifidus muscle, morphologic change of psoas muscle, and visceral-to-subcutaneous adipose tissue area ratio (VSR) were measured. Multivariate analysis indicated that SMI and VSR are prognostic factors (<i>P</i> = 0.016, 0.046, respectively). The prognostic score, which was the frequency of positive SMI and VSR values within the cutoff, indicates overall survival. The five-year OS rates of patients with prognostic scores of 0, 1, and 2 were 90.9%, 62.3%, and 52%, respectively (<i>P</i> < 0.001).	Yes
2021 Miura <i>et al.</i> [151]	259 patients NSCLC patients ≥ 65 years old who underwent pulmonary resection	Patients with sarcopenia, determined by PMI, before surgery tended to have postoperative complications (<i>P</i> = 0.0521), but not a poor prognosis. Multivariate analysis revealed that postoperative complications and the progression of sarcopenia 1 year after surgery were significant risk factors for a poor prognosis (<i>P</i> = 0.0169 and 0.00370, respectively).	Yes
2021 Horii <i>et al.</i> [152]	39 patients who underwent gastrectomy followed by preoperative chemotherapy for advanced gastric cancer	Based on changes in PMA before and after preoperative chemotherapy, patients were divided in 2 groups: remarkable muscle depletion and normal groups. No significant difference was observed in the recurrence-free survival between the two groups (<i>P</i> = 0.484), overall survival was significantly worse in the remarkable muscle depletion group (<i>P</i> < 0.001). Multivariate analysis for prognosis showed that decreased PMA (<i>P</i> = 0.038) is an independent prognostic factor.	Yes

2021 Takahashi <i>et al.</i> [153]	315 patients with pathologic stage I NSCLC who had undergone lobectomy with systematic nodal dissection	Upon multivariable analysis, male sex (OR: 5.780; $P < 0.001$), and sarcopenia (patients in the lowest quartile of PMA) (OR =21.00; $P < 0.001$) were independently associated with postoperative complications. The sarcopenia group showed significantly lower 5-over all survival ($P < 0.001$) and recurrence-free survival ($P < 0.001$) comparing with the non-sarcopenia group. In a multivariable analysis, sarcopenia was an independent prognostic factor (HR: 1.978, 95%; $P = 0.010$) together with age ≥ 70 years (HR =1.956; $P = 0.015$) and non-adenocarcinoma histology (HR =1.958; $P = 0.016$).	Yes
2021 Uemura <i>et al.</i> [154]	105 patients with esophageal cancer who underwent video-assisted surgery.	Among male patients, PMI and preoperative nutritional and muscular (PNM) scores were significant risk factors for complications. Among male patients, in the high PMI group, the number of CD \geq IIIa complications was significantly lower. In both genders, PMI and BMI were not significantly associated with survival.	Yes +/-
2021 Sakamoto <i>et al.</i> [155]	105 patients aged ≥ 65 years who underwent pancreatectomy for pancreatic cancer	Multivariate analysis revealed that the combination of the geriatric nutritional risk index (GNRI) and psoas muscle volume (PMV) was an independent prognostic factor in patients aged ≥ 65 years with pancreatic cancer ($P = 0.003$).	Yes
2021 Ishida <i>et al.</i> [156]	333 patients with esophageal cancer who underwent neo-adjuvant chemotherapy followed by esophagectomy.	Low PMI combined with high intramuscular adipocyte area (IMAC) as severe sarcopenia. Multivariable analysis of overall survival showed that severe sarcopenia (HR 1.68, $P = 0.025$) was an independent predictor of poor outcome.	Yes
2021 van Wijk <i>et al.</i> [157]	128 after liver resection for colorectal liver metastasis (CRLM).	Changes in PMI and average muscle radiation attenuation (AMA) of the psoas muscle were assessed. Overall survival was lower in patients with both muscle quantity and quality loss compared to other categories ($P = 0.049$). The rate of postoperative complications was significantly higher in the group with surgery-related loss of muscle quality	Yes
2021 Daffrè <i>et al.</i> [158]	238 non-small cell lung-cancer patients undergoing pneumonectomy	PMA, cross-sectional total muscle area (TMA), and total parietal muscle area (TPMA), defined as TMA without TPA were measured. Lower PMA, TMA, and PMA were associated with lower survival at univariate analysis. Being sarcopenic at both psoas and parietal muscle level had the optimum discriminating power. At the multivariable analysis, sarcopenia at both psoas and parietal muscles, male sex, increasing age, and tumor stage, as well as Charlson Comorbidity Index (CCI), were independently associated with worse 5-y survival.	Yes
2021 Salman <i>et al.</i> [159]	97 patients with hepatic cellular cancer undergoing radiofrequency ablation (RFA)	Sarcopenia, defined skeletal muscle index (SMI) and MELD score were independent predictors of OS at two years with HR of 7.6 and 2.2, respectively. Recurrence-free survival was 84.1% at two years. Recurrence was not affected by all factors, including sarcopenia.	Yes
2021 Benedek <i>et al.</i> [160]	51 patients who underwent colorectal cancer surgery	The low- and high-grade groups showed a significantly lower PMA, and PMD ($P < 0.001$ in both cases).	+/-
2021 Furukawa <i>et al.</i> [161]	118 patients with colorectal liver metastases (CRLM) after hepatic resection	Osteopenia was evaluated by measurement of pixel density at the midvertebral core of the 11 th thoracic vertebra. Sarcopenia was evaluated with PMA. Osteosarcopenia was defined as the concomitant occurrence of osteopenia and sarcopenia. In multivariate analysis, lymph node metastases ($P < 0.01$), osteosarcopenia ($P < 0.01$), and GPS 1 or 2 ($P = 0.03$) were independent predictors of the overall survival.	Yes
2021 Watanabe <i>et al.</i> [162]	242 patients aged ≥ 65 ears who underwent curative gastrectomy.	The sarcopenia stage was classified by the combination of preoperative skeletal muscle quantity and quality (non-sarcopenia, sarcopenia, and severe sarcopenia). Multivariable analysis demonstrated that severe sarcopenia as an independent predictor of overall survival (HR: 4.01).	Yes
2021 Stangl-Kremser <i>et al.</i> [163]	441 bladder cancer patients who underwent radical cystectomy (RC) and urinary diversion.	The 1-year mortality rate was 11.6%. Multivariable logistic regression analysis revealed an association between increased PMI (PMA normalized to height) and lower odds of 30-day complications after RC (OR 0.95, $P = 0.02$). An increase in PMI was of prognostic value, although not statistically significant in the multivariable model ($P = 0.05$) once adjusting for other patient factors.	Yes
2021 Wang <i>et al.</i> [164]	112 bladder cancer (BCa) patients after radical cystectomy.	The CTA (a combination of PMI and albumin-globulin ratio (AGR)) grade could better predict postoperative outcomes compared with PMI, AGR, and AGS for the highest area under the curve (AUC; 0.674 of overall survival	Yes

		(OS) and 0.681 of disease-free survival (DFS). The 3- and 5-year OS and DFS nomograms were conducted based on CTA grade and clinical variables, with a higher predictive performance than the TNM stage.	
2021 Abe <i>et al.</i> [165]	225 patients with locally advanced rectal cancer (LARC)	A new prognostic score (PNSI) was devised based on the prognostic nutritional index (PNI) and the psoas muscle mass index (PMI): patients with malnutrition/sarcopenia were scored 2; patients with one and neither abnormality were scored 1 and 0, respectively. Post preoperative chemoradiotherapy (CRT) PNSI was associated with overall survival and was an independent poor prognosis factor (PNSI 1 to 0, HR: 2.40, $P = 0.034$, PNSI 2 to 0, HR: 2.66, $P = 0.043$)	Yes
2021 Mercan <i>et al.</i> [166]	40 patients with primary high-grade ovarian cancer undergoing cytoreductive surgery and hyperthermic intraperitoneal chemotherapy	Univariate analysis: advanced age (OR: 1.40; $P = 0.021$) and sarcopenia, determined by using PMI cut-off values, (OR: 7.71%; $P = 0.039$) were significantly associated with serious postoperative complications. The presence of sarcopenia (OR: 0.050; $P = 0.024$) was found to be an independent predictor of serious postoperative complications.	Yes

Supplemental Table 7. Psoas muscle area and/or attenuation variables and outcome in internal non-vascular disease			
Year & Reference	Number of patients	Study results	Association (Y/N)
2016 Morrell <i>et al.</i> [167]	adult participants on maintenance hemodialysis	- In separate multivariable linear regression models, PMA was associated with increase in (lean body mass) LBM. - In separate multivariate logistic regressions, sarcopenia (defined as <25 th percentile of LBM and < 10 th percentile of LBM) C statistic was 0.81 and 0.92 for PMA, respectively.	Yes
2017 Nishikawa <i>et al.</i> [168]	206 patients with liver cirrhosis (LC)	- The proportion of protein-energy malnutrition (PEM) in patients with low skeletal muscle mass (LSMM) (31.62%) was significantly higher than in patients without LSMM (16.85%) ($P = 0.0229$). - In the multivariate analysis, presence of LSMM was found to be a significant adverse predictor of overall survival.	Yes
2017 Harada <i>et al.</i> [169]	266 asymptomatic CKD patients	- During the follow-up period (median: 3.2 years), patients with low PMI had significantly higher risk of MACE than those with high PMI (31.7% and 11.2%, log-rank test, $P < 0.001$). - The Cox proportional hazard model showed that low PMI is an independent predictor of MACE in CKD patients (HR 3.98, 95% CI: 1.65-9.63, $P = 0.0022$).	Yes
2017 Ishizu <i>et al.</i> [170]	122 cirrhotic patients with acute variceal bleeding	On multivariate analysis, low PMA (OR: 4.69; $P = 0.024$), nonalcoholic etiology (OR: 10.3; $P = 0.024$), higher INR of prothrombin time (OR: 41.4; $P < 0.001$), and rebleeding within 6 wk (OR: 27; $P < 0.001$) were associated with 6-wk mortality.	Yes
2017 Abe <i>et al.</i> [171]	87 metastatic urothelial CA patients who underwent chemotherapy	TPA were not significant prognostic factors even when stratified by BMI ($P = 0.294$ and 0.448)	No
2017 Ishii <i>et al.</i> [172]	61 patients: unresectable pancreatic CA undergoing systemic chemotherapy	The 1-year cumulative survival rate was 43.3% in the PMI-High group and 12.9% in the PMI-Low group ($P = 0.0027$). Multivariate analysis, PMI ($P = 0.0036$) was an independent predictor of overall survival.	Yes
2017 Murimwa <i>et al.</i> [173]	77 patients with locally advanced esophageal cancer treated with neoadjuvant chemoradiation followed by surgery	- Sarcopenia was associated with increased acute grade ≥ 3 toxicity from chemoradiation ($P = 0.003$, AUC 0.709, sensitivity 60.9%, specificity 78.8%) ($P = 0.002$). - Patients with PMA < 841.5 mm ² /m ² were 5.78 times more likely to develop grade 3 or higher toxicity ($P = 0.004$). Sarcopenia did not predict a difference in overall survival ($P = 0.217$).	Yes
2018 Okugawa <i>et al.</i> [174]	167 colorectal cancer patients	Decreased PMI was an independent prognostic factor for both overall survival and disease-free survival and was an independent risk factor for various types of metastasis.	Yes
2018 Zakaria <i>et al.</i> [175]	118 patients with breast cancer spinal metastases	- Compared to patients in the highest and mid PMA tertile, patients in the first PMA tertile had significantly shorter survival (HR 1.76, $P = 0.024$) and (HR 1.95; $P = 0.007$), respectively.	Yes
2018 Kalafateli <i>et al.</i> [176]	98 patients with liver cirrhosis	- Average total psoas density (ATPD) was significantly correlated with model for end-stage liver disease (MELD) score ($r = -0.218$, $P = 0.034$). - Multivariate analysis: higher Child-Pugh score (HR 1.2), advanced age (HR 1.038) and lower ATPD (HR 0.967, 95%CI 0.937-0.997) were predictors of mortality.	Yes
2018 Zakaria <i>et al.</i> [177]	46 patients with multiple myeloma (MM) spinal metastases, treated with stereotactic body radiation therapy.	Patients in the lowest tertile of PMA had significantly shorter survival compared to the highest tertile (HZ 6.87, $P = 0.008$). The Ppatients in the lowest PMA-to-vertebral body ratio had a significantly shorter OS compared to the highest tertile (HZ 6.87, $P = 0.010$).	Yes
2019 Mitsui <i>et al.</i> [178]	50 patients with testicular CA undergoing chemotherapy	A multivariate analysis identified psoas major muscle volume loss as a significant and independent predictor of poor prognosis.	Yes
2019 Matsuoka <i>et al.</i> [179]	236 patients with cervical CA undergoing concurrent chemotherapy or RT	Neither PI nor SMI were prognostic predictors in patients with cervical CA undergoing concurrent chemotherapy or RT	No
2019 Shoreibah <i>et al.</i> [180]	241 patients with cirrhosis who underwent TIPS	The threshold of pre-TIPS psoas muscle density (PD) for discrimination of survival was 29.4 HU ($P < 0.0001$). PD > 29.4 HU was associated with a lower risk of mortality (HR, 0.27; 95%CI, 0.13-0.57; $P = 0.0006$). Compared with the	Yes

		use of MELD score alone, the addition of PD measurement significantly increased the area under the curve from 0.61 to 0.68 ($P = 0.0006$).	
2019 Shiroyama <i>et al.</i> [181]	42 patients previously treated for advanced non-small cell lung cancer (NSCLC) with nivolumab or pembrolizumab	Sarcopenia was defined based on PMI cut-off values for Asian adults. Sarcopenia was associated with poorer progression-free survival (PFS) ($P = 0.004$). Compared to patients with sarcopenia, those without sarcopenia had a higher overall response rate (40.0% vs. 9.1%, $P = 0.025$) and 1-year PFS rate (38.1% vs. 10.1%)	Yes
2019 Praktijnjo <i>et al.</i> [182]	196 patients with liver cirrhosis receiving TIPS (Transjugular Intrahepatic Portosystemic Shunt)	CT measured sex-specific sarcopenia classification is an independent predictor of 1-year mortality and ACLF development in patients with cirrhosis receiving TIPS. Patients in the sarcopenia group showed significantly higher rates of mortality, ascites, overt hepatic encephalopathy, and ACLF after TIPS compared with the nonsarcopenia group.	Yes
2019 Kawaguchi <i>et al.</i> [183]	173 patients aged > 75 years of age received lobectomy for non-small cell lung	Sarcopenia was defined as PMI < 3.70 cm ² /m ² in males and 2.50 cm ² /m ² in females, based on the morbidity rate. The postoperative complication rate was significantly higher in patients with sarcopenia (62.5%) than in those without sarcopenia (22.7%). The 5-year survival rate was 26.5% in patients with sarcopenia, and 66.3% in patients without sarcopenia.	Yes
2019 Nisioka <i>et al.</i> [184]	38 patients with advanced non-small cell lung cancer (NSCLC) who were treated with Anti-PD-1/PD-L1 therapy	Patients were divided into two groups according to the change rate of the PMA and investigated the correlation between the change rate of the PMA and the efficacy of ICIs. The response and disease control rates were lower in patients with sarcopenia than in those without sarcopenia. Patients with sarcopenia exhibited a significantly shorter median progression-free survival (PFS) than non-sarcopenia patients.	Yes
2019 Jahangir <i>et al.</i> [185]	76 patients with cirrhosis undergoing TIPS	Muscle gain at 1-year after TIPS was independently associated with lower mortality (psoas HR 0.14, $P = 0.016$; paraspinal HR 0.15, $P = 0.016$). Baseline demographic or clinical variables were not associated with muscle gain after TIPS.	Yes
2019 Matsubara <i>et al.</i> [186]	92 patients with ovarium cancer	Lower psoas volume (PV) (< 195.6 cm ³) had significantly poorer PFS and OS ($P = 0.018$ and $P = 0.006$, respectively). PV was also demonstrated to be superior to PMA in prognosis prediction.	Yes
2019 Gṙat el al. [187]	77 hepatocellular CA patients after liver transplantation	PMA was not associated with recurrence-free survival	No
2020 Al-Azzawi <i>et al.</i> [188]	194 alcoholic hepatitis patients	Sarcopenia also correlated with significantly longer hospital stay; the average LOS was 17.2 days and 12.4 days in the sarcopenia and non-sarcopenia group, respectively. A higher risk of developing pneumonia, sepsis and hepatic encephalopathy was observed in sarcopenic patients.	Yes
2020 Welch <i>et al.</i> [189]	83 patients with cirrhotic liver	Survival in liver cirrhosis was dependent on initial muscle mass, rate of muscle loss and MELD score.	Yes
2020 Tsukagoshi <i>et al.</i> [190]	30 patients with advanced NSCLC treated with Nivolumab	- Skeletal muscle index, determined by PMA/height ² , was used to measure skeletal muscle (SM) loss. - Patients with SM loss had a significantly shorter progression-free survival period ($P = 0.008$) and overall survival than those with normal SM mass ($P = 0.03$). SM loss was an independent prognostic factor of poor survival.	Yes
2021 Ireland <i>et al.</i> [191]	109 patients under parenteral nutrition (PN)	Psoas muscle density predicted the development of hypophosphatemia in patients initiated on PN	Yes
2020 Bae <i>et al.</i> [192]	126 older than 65 years who underwent surgery for hip fracture	- Based on PMI and T-score (bone densitometry), the study population was divided into osteoporosis, sarcopenia, osteosarcopenia, or normal groups. - Fracture incidences were significantly higher in the osteosarcopenia group than in the normal group ($P = 0.046$), and T-score and PMI were found to be strongly correlated ($a < 0.01$; $R = 0.763$).	Yes
2020 Hu <i>et al.</i> [193]	156 melanoma patients undergoing pembrolizumab treatment.	Psoas muscle index (PMI) was determined. Patients in the lowest sex-specific tertile of PMI were defined as sarcopenic. Sarcopenia was not significantly associated with toxicity, response, or survival. However, obese patients (BMI >30) experienced higher rates of toxicity ($P = 0.0007$).	No
2020 Artru <i>et al.</i> [194]	179 patients with cirrhosis who underwent transjugular intrahepatic	Sarcopenia, assessed by transversal right psoas muscle thickness at the umbilical level/height (TPMPT/height), is independently associated with 6-month outcome and improves after TIPSS placement, together with an inverse evolution of subcutaneous and visceral fat. TIPSS not only treats PHT but also improves body composition.	Yes

	portosystemic shunt (TIPSS) placement		
2021 Murachi <i>et al.</i> [195]	44 patients with colorectal cancer treated with regorafenib	Sarcopenia, determined by measuring PMI, was significantly associated with poorer overall survival (OS) ($P = 0.031$). Multivariate analysis showed that sarcopenia was a significant predictor of prognosis.	Yes
2020 Cheng <i>et al.</i> [196]	385 patients who developed radiology-proven hepatocellular cancer (HCC) progression after sorafenib treatment	Pre-sarcopenia is defined as transverse psoas muscle thickness per body height < 16.8 mm/m. Patients with muscle depletion had significantly worse post-progression survival (PPS) compared with their counterparts ($P = 0.003$). Pre-sarcopenia independently predicted post-progression mortality in sorafenib-failed HCC (hazard ratio: 1.340, $P = 0.012$). Muscle restoration after sorafenib treatment was associated with a longer PPS compared with their counterparts ($P = 0.043$).	Yes
Yoshimura <i>et al.</i> [197]	103 squamous cell carcinoma (OSCC) patients	Preoperative psoas muscle mass index (PMI) and intramuscular adipose tissue content (IMAC) was evaluated. The disease-specific survival (DSS) rate in patients with high IMAC and low PMI was significantly lower than that in controls. Multivariate analysis revealed that a low preoperative Prognostic Nutritional Index (PNI) and high IMAC were independent risk factors	Yes
2020 Looijaard <i>et al.</i> [198]	254 older colon cancer patients	Psoas muscle density, and lateral muscle density and percentage intermuscular adipocyte area (IMAT) were associated with severe postoperative complications independent of gender, age and cancer stage.	Yes
2021 Zager <i>et al.</i> [199]	121 patients with Crohn's disease (CD) undergoing gastrointestinal surgery	On multivariate analysis, PMA ($HR = 0.72/cm^2$, $P = 0.02$) was an independent predictor for postoperative complications.	Yes
2021 Bamba <i>et al.</i> [200]	187 patients were enrolled, 99 with Crohn's disease and 88 with ulcerative colitis	Multivariate logistic regression analysis showed that low albumin level and low PMI on admission were associated with prolonged length of stay. Multivariate Cox regression analysis demonstrated that male sex, Crohn's disease (not ulcerative colitis), low PMI, and high visceral-to-subcutaneous adipocyte tissue area ratio were associated with intestinal resection.	Yes
2021 Paternostro <i>et al.</i> [201]	203 patients with advanced chronic liver disease (ACLD) and hepatic venous pressure gradient (HVPG) ≥ 10 mm Hg	Sarcopenia was defined by transversal psoas muscle thickness (TPMT) at < 12 mm/m in men and < 8 mm/m. Sarcopenia was associated with first/further decompensation both in compensated and in decompensated patients ($P = 0.041$ and $P = 0.021$, respectively). Sarcopenia was a significant predictor of mortality irrespective of hepatic venous pressure gradient (HVPG). On multivariate analysis adjusted for age, HVPG and MELD, sarcopenia was an independent risk factor for mortality (aHR: 1.99, $P = 0.007$).	Yes
2021 Iltar <i>et al.</i> [202]	120 patients with diffuse large B-cell lymphoma treated with rituximab-based chemoimmunotherapy	Sarcopenia, defined by PMI, displays a worse response to treatment compared with non-sarcopenic patients. In a multivariate analysis, sarcopenia remained predictive of outcomes for overall survival ($P = 0.009$), progression free survival ($P = 0.028$), and response to treatment ($P = 0.006$).	Yes
2021 Aleixo <i>et al.</i> [203]	338 patients receiving adjuvant chemotherapy for breast cancer	Psoas muscle, myosteatorsis was associated with any adverse event (RR 1.66, $P < 0.0001$), dose reduction (RR 1.63, $P = 0.05$), and early treatment discontinuation (RR 2.14, $P = 0.03$).	Yes
2020 Hirota <i>et al.</i> [204]	40 patients with refractory malignant lymphoma, undergoing autologous stem cell transplantation (ASCT)	PMI was significantly decreased after ASCT (4.61 vs. 4.55 cm^2/m^2 ; $P = 0.0425$). The rates of change in PMI were -5.57% and -3.97% for patients administered MCEC and LEED, respectively.	Yes
2021 Alipour <i>et al.</i> [205]	85 patients with inflammatory bowel disease (IBD)	Sarcopenia was defined by sex-specific PMTH (PMA indexed to height) using a 50 th percentile median cutoff. There was no significant difference using PMTH compared to a model incorporating hypoalbuminemia and biologic use in predicting complications. Sarcopenia on univariate analysis was associated with a lower 30 day rate of reoperation ($P = 0.04$).	No
2021 Iwai <i>et al.</i> [206]	72 patients with unresectable pancreatic cancer	The median overall survival (OS) was 278.0 days in the high-PMI group and 221.0 days in the low-PMI group ($P = 0.329$). The median OS was 347.0 days in the group without PMI decrease and 172.0 days in the group with PMI decrease ($P = 0.001$).	Yes

2021 Lucijanac <i>et al.</i> [207]	104 newly diagnosed diffuse large B-cell lymphoma (DLBCL) patients with unfavorable disease features treated with the R-DA-EPOCH regimen.	One quarter of patients had more pronounced PMA loss ($\geq 21\%$), which was associated with significantly worse overall and progression-free survival. A $\geq 21\%$ PMA loss remained independently associated with lower OS (HR = 2.98; $P = 0.016$) and achieving response HR = 0.04; $P < 0.001$) and achieving response HR = 0.08; $P = 0.001$) in multivariate analyses.	Yes
2021 Shimizu <i>et al.</i> [208]	240 patients treated with chemotherapy for urothelial carcinoma	Skeletal muscle mass (PMA, paraspinal muscle, and total skeletal muscle areas) were used to calculate the PMI, paraspinal muscle index, and SMI. Groups with lower paraspinal muscle index were defined as sarcopenic (men: $\leq 20.9 \text{ cm}^2/\text{m}^2$, women: $\leq 16.8 \text{ cm}^2/\text{m}^2$). The overall survival was significantly longer in the non-sarcopenia group including all stages ($P = 0.001$), and in stage III ($P = 0.048$) and IV ($P = 0.005$) patients. After propensity score matching, survival was still significantly longer in the non-sarcopenia group ($P = 0.004$).	Yes
2021 Jördens <i>et al.</i> [209]	75 cholangiocarcinoma (CCA) patients undergoing palliative treatment	Using a calculated optimal cut-off value of $71.95 \text{ mm}^2/\text{cm}$, CCA patients with an L3S-MI value below this cut-off showed a significantly reduced median overall survival (OS) of only 250 days compared to 450 days in patients with a higher L3SMI. Moreover, the median OS of CCA patients with an L3PMI above $6345 \text{ mm}^2/\text{cm}$ was 552 days compared to 252 days in patients with a lower L3PMI. Finally, CCA patients with a skeletal muscle attenuation (MMA) above 30.51 Hounsfield Units survived significantly longer (median OS: 430 days) compared to patients with an MMA value below this ideal cut-off (median OS: 215 days). The prognostic relevance of L3SMI, L3PMI, and MMA was confirmed in uni- and multivariate Cox regression analyses.	Yes
2021 McDonald <i>et al.</i> [210]	2,066 men treated with radiation therapy for prostate cancer (864 from NRG/RTOG 9406 and 1,202 from NRG/RTOG 0126 trials)	PMA, PMD, and vertebral body density were individually associated with overall survival. In the final multivariable model, PMA, comorbidity score, and age were associated with overall survival (Table). The Recursive partitioning (RPA) yielded a classification tree with 4 prognostic groups determined by age, comorbidity, and psoas cross-sectional area. When the RPA classification was applied the discriminant ability was preserved ($P < 0.001$ groupwise log-rank).	Yes
2012 Miller <i>et al.</i> [211]	125 patients with adrenocortical carcinoma	PMD and LPMA ($P \leq 0.0001$, ≤ 0.0024 , respectively) are associated with survival. Both variables improve prediction of survival compared to using stage alone. A 100-mm ² increase in LPMA confers an 8 % lower hazard of death.	Yes
2013 Dodson <i>et al.</i> [212]	216 patients undergoing intra-arterial therapy of hepatic malignancies	- On multivariate analysis, sarcopenia was independently associated with increased risk of death (lowest vs. highest PMA quartile, HR = 1.84; $P = 0.04$). - Sarcopenic patients had a 3-year survival of 28 vs. 44 % for non-sarcopenic patients.	Yes
2015 Wilson <i>et al.</i> [213]	137 patients with sarcopenic soft-tissue sarcoma	Height-adjusted PMA was not an independent predictor of overall survival ($P = 0.746$). Patient age ($P = 0.02$) and tumor size ($P = 0.009$) and grade ($P = 0.001$) were independent predictors of overall survival.	No
2017 De Amorim <i>et al.</i> [214]	60 patients with primary extremity soft tissue sarcomas	Decreased attenuation of psoas muscle was associated with tumor recurrence ($P = 0.0002$). The association remained significant after adjusting for covariates ($P \leq 0.01$).	Yes

Supplemental Table 8. Psoas muscle area and/or attenuation variables and outcome in pediatric population			
Year & Reference	Number of patients	Study results	Association (Y/N)
2017 Lopez <i>et al.</i> [215]	36 pediatric complex appendicitis patients	- The median change in BMI among all patients from admission to discharge was -0.8 kg/m^2 (interquartile range: -1.3 to -0.2). - The mean percentage change in PMA per day over the course of appendicitis-related treatment was -0.81% (95%CI: -1.12 to -0.50) ($P < 0.001$). - The relative decrease in PMA per day did not vary by initial BMI, gender, or race ($P > 0.10$ for all interactions).	Yes
2018 Suzuki <i>et al.</i> [216]	47 consecutive first-onset acute lymphoblastic leukemia (ALL) patients	- PMA changes were expressed as the Muscle Loss Index (MLI), which was calculated by dividing the post-treatment PMA by the pre-treatment PMA. - Sarcopenia was found to be an independent prognostic factor for invasive fungal infection (IFI) that occurs after induction therapy.	Yes
2018 Lurz <i>et al.</i> [217]	23 children with end-stage liver disease (ESLD)	Median PMA was significantly smaller in ESLD subjects compared with the 46 healthy controls ($P = 0.004$).	Yes
2021 Ooi <i>et al.</i> [218]	30 children with end-stage liver disease (ESLD) matched to 24 healthy children	Skeletal muscle mass (SMM; $\text{cm}^2/\text{height}^2$) and subcutaneous adipose tissue (SAT) were measured during liver transplantation (LTx) assessment. Myopenia with low SAT was prevalent in older (>2 years), male children and was associated with gross motor delay, reduced energy intake, and increased hospitalization and infections (total/viral/fungal).	Yes
2021 Ritz <i>et al.</i> [219]	33 children with hepatoblastoma	Relapse was significantly higher in the high-risk sarcopenic group compared to the nonsarcopenic group ($P = 0.008$). The change in tPMA z-score 1-4 months after surgery did not improve in patients with relapse, but did improve in 75% of children without relapse.	+/-
Woolfson <i>et al.</i> [220]	25 children between 1 and 16 years with end-stage liver disease	Sarcopenia was defined as tPMA z score less than -2 . Sarcopenic children had a longer duration of pediatric intensive care unit (PICU) stay (3.50 versus 2.00 days; $P = 0.03$). Sarcopenia was prevalent in 40% of children with ESLD awaiting LT, and lower tPMA z score was associated with deficient anthropometrics and need for nutritional support before LT. Post-LT PICU duration was increased in children with sarcopenia, reflecting adverse outcomes associated with muscle loss.	Yes
2021 Boster <i>et al.</i> [221]	57 children, being candidates for liver transplantation (LT)	LT candidates had an increased risk of death with lower PMA (HR: 1.6 per 100 mm^2 , $P = 0.03$), amounting to a 4.9 times higher risk of death for every 1 unit decrease in PMA z score (HR: 4.9; $P = 0.05$), adjusting for age and sex. PMA did not correlate with posttransplant length of intubation, hospital length of stay, or perioperative complications. PMA also did not correlate with ($P = 0.60$) the Model for End-Stage Liver Disease/Pediatric End-Stage Liver Disease scores ($P = 0.69$).	Yes
2021 Atlan <i>et al.</i> [222]	101 children with inflammatory bowel syndrome.	Patients with a PMI in the lowest quartile had significantly higher risk for biologic therapy (multivariate analysis, HR: 12.1, $P = 0.046$) and disease exacerbation ($P = 0.047$) independently of BMI, compared with patients with a psoas index in the uppermost quartile.	Yes
2021 Jitwongwa <i>et al.</i> [223]	105 children, most with biliary atresia, waiting for liver transplantation	Patients with waitlist mortality had lower PMI (PMA/ height^2) compared those who survived to transplantation ($P = .04$), but not in the multivariate analyses. For transplanted patients, a higher rate of re-operation ($P = 0.03$) and longer hospital stay (53 vs. 45 days, $P = 0.02$) were found in patients with lower PMI. Lower PMI is associated with higher re-operation rate and longer hospital stay following transplantation, but not waitlist mortality.	+/-
2021 Verhagen <i>et al.</i> [224]	101 patients Patients aged 0-18 years who underwent a primary liver transplant	Subcutaneous fat area index (ScFI) was significantly ($P = 0.001$) correlated with moderate to severe postoperative infections in children aged < 1 year, with the optimal ScFI threshold being $\leq 27.1 \text{ cm}^2/\text{m}^2$ (sensitivity 80.4% and specificity 77.8%). A weak negative correlation between SMI and the total duration of hospital stay ($P = 0.01$) and intensive care unit (ICU) stay ($P = 0.01$) was observed in children aged < 1 year. No other associations between CT-based body metrics and postoperative outcomes were shown.	Yes

2021 Ritz <i>et al.</i> [225]	101 children with workup for neuroblastoma	No association between sarcopenia and short-term outcome was observed. Sarcopenia had a sensitivity of 0.82 and a specificity of 0.48 in predicting 5-year survival. In a multiple regression analysis, pre-operative sarcopenia was associated with 5-year survival after surgery, with HR of 4.18 (95% CI: 1.01-17.26).	Yes
2021 McBee <i>et al.</i> [226]	164 patients (median age 9.9 years) with cancer.	Days neutropenic and normalized days neutropenic were significantly but weakly negatively correlated with tPMA at L3 ($r = -0.24, P < 0.002$ and $r = -0.18, P < 0.05$ respectively). At subanalysis, the correlation between anthropometric features and normalized days neutropenic was only seen with brain tumors. There was no statistically significant relationship between sarcopenia at diagnosis and disease-free survival DFS or overall survival (OS) overall or in subanalysis.	No

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