**Supplementary table 1.** Summary of studies examining body composition and toxicity to chemotherapy.

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| **Refence** | **Cancer type/stage/*n*** | **Treatment** | **% Sarcopenic** | | **Sarcopenia definition** | **Summary of findings related to toxicity** |
| Prado *et al*. 2007(80) | Colon cancer/Stage II-III/62 | 5-Fluorouracil  (5-FU) | | NR | NR | A cut point of 20 mg 5-FU/kg LM seemed to be a threshold for developing overall toxicity. DLT was experienced by 93% of patients above this threshold compared to 52% of patients below this threshold. This observation was pertinent to women (OR 16.73, *p*=0.021). |
| Prado *et al*. 2009(71) | Breast cancer/Metastatic/55 | Capecitabine | | 26% | Prado *et al*. 2008 | Patients with sarcopenia received a higher dose of capecitabine per unit of LM (104.2 vs. 86.9 mg/kg LM, p<0.0001) and experienced more toxicity (50% vs. 20%, *p*=0.03) compared to their non sarcopenic counterparts. Time to tumour progression was shorter in sarcopenic patients (101.4 days vs. 173.3 days, *p*=0.05). |
| Antoun *et al*. 2010(73) | Renal cell carcinoma/ Metastatic/55 | Sorafenib | | 55% | Baumgartner *et al*. 1998 (CT converted DXA cut points) | Dose limiting toxicity (DLT) was more common in sarcopenic patients whose BMI was <25 kg/m2 and least common in patients who were not sarcopenic and/or had a BMI >25 kg/m2 (41% vs. 13%, *p*=0.03). |
| Prado *et al*. 2011(90) | Breast cancer/Stage II/III/24 | 5-FU, Epirubicin, cyclophosphamide | | NR | NR | Mean LM was lower for patients presenting with toxicity compared to those were toxicity was absent (41.6 vs. 56.2 kg, *p*=0.002) and LM correlated with neutrophil nadir (*r*=0.5, *p*=0.023). For one kg unit increase in LM, there was approximately 19% increase in the rate of clearance of epirubicin after adjusting for the effect of AST. |
| Mir *et al*. 2012(75) | Hepatocellular carcinoma/Advanced/40 | Sorafenib | | 28% | Baumgartner *et al*. 1998 (CT converted DXA cut points) | Sarcopenic patients experienced more DLTs than non-sarcopenic patients (82% vs. 31%, *p*=0.005). Grade III diarrhoea was more frequent in sarcopenic patients than non-sarcopenic patients (46% vs. 7%, *p*=0.01). On day 28, median sorafenib AUC (*n*=17) was significantly higher in sarcopenic patients (102.4 mg/l.h vs. 53.7 mg/l.h, *p*= 0.013). |
| Parsons *et al.* 2012(86) | Advanced (different sites) with liver mets/48 | HAI oxaliplatin combined with 5-FU/ leucovorin and bevacizumab | | 42% | Prado *et al*. 2008 | Grade III-IV toxicity did not differ among patients with and without sarcopenia or according to BMI (*p*>0.05). |
| Huillard *et al*. 2013(74) | Renal cell carcinoma/Metastatic/61 | Sunitunib | | 53% | Baumgartner *et al*. 1998 (CT converted DXA cut points) | Sarcopenic patients with a BMI <25 kg/m2 (33%) experienced more DLTs [OR: 4.1, (95% CI:1.3-13.3), *p*=0.01], more cumulative grade II or III toxicities (*p*=0.008), more grade III toxicities (*p*=0.04) and more acute vascular toxicities (20% vs. 0%, *p*=0.009). |
| Veasey-Rodrigues *et al*. 2013(87) | Mixed solid tumours/ Advanced/16 | Temsirolimus | | 44% | Prado *et al*. 2008 | Baseline sarcopenia and body composition did not significantly correlate with toxicity profile or treatment outcome. |
| **Reference** | **Cancer type/stage/*n*** | **Treatment** | **% Sarcopenic** | | **Sarcopenia definition** | **Summary of findings related to toxicity** |
| Massicotte *et al*. 2013(78) | Medullary thyroid cancer/Advanced/33 | Vantetanib | | - | SMI <43.1cm2/m2 for both men and women (cut off corresponding to the level that predicted the occurrence of toxicity most accurately) | Patients with a low SMI had a higher probability of DLT (73% vs. 14%, *p*=0.04) and higher serum concentrations of Vantetanib (1037 vs. 745 ng/ml, *p*=0.04). Patients with a SMI <43.1 cm2/m2 and a BMI <25 kg/m2 had a higher probability of DLT (83%) vs. those with a SMI >43.1 cm2/m2 and/or BMI >25 kg/m2 (18%)(*p*<0.001). |
| Barret *et al*. 2014(55) | Colorectal cancer/Metastatic/51 | 1.FP+Oxaliplatin. 2.FP+Irrinotecan. 3. FP Alone 4. Irinorecan without FP | | 71% | Baumgartner *et al*. 1998 (CT converted DXA cut points) | Sarcopenic patients experienced more grade III-IV toxicity compared with non-sarcopenic patients (33.3% vs. 13.3%, *p*=0.184). All individual grade III-IV toxicities were more frequent in sarcopenic patients, but did not reach statistical significance. In multivariate logistic regression, the only factor associated with grade III-IV toxicity was sarcopenia (OR=13.55, 95% CI: 1.08-169.31) *p*=0.043. |
| Prado *et al*. 2014(91) | Ovarian cancer/Advanced/74 | Doxil and trabectedin | | NR | NR | LM alone was not predictive of DLT (Doxorubicin is a lipophilic drug). A low FM/LM ratio was the most powerful variable associated with toxicity (*p*=0.006). |
| Cousin *et al*. 2014(177) | Mixed cancer types/ stage NR/93 | Phase 1 patients: Mixed types of drugs | | - | Below the median (<54.1 cm2/m2 for males and <40.8 cm2/m2 for females) | SMI was lower in patients with a DLT compared to patients without a DLT (40.8±4.6 vs. 48.1±9.6 cm2/m2, *p*=0.01). DLT was observed in 25.5% of patients with sarcopenia compared with 6.5% of patients without sarcopenia (*p*=0.02). |
| Yip *et al.* 2014(85) | Oesophago gastric/ Stage I-III)/35 | NACT: 5FU; Platinum/5FU; ECX/ECF | | 26% | Prado *et al*. 2008 | The presence of sarcopenia was not associated with chemotherapy dose reduction (*p*=0.268). |
| Tan *et al.* 2015(84) | Oesophago-gastric cancer/Stage I-III/89 | Squamous cell carcinoma: Epirubicin, cisplatin and capecitabine Adeno: Cisplaitin, 5 FU | | 49% | Prado *et al*. 2008 | Sarcopenic patients experienced more DLT than their non-sarcopenic counterparts (55% vs. 29%, *p*=0.015). Sarcopenia associated with DLT on multivariate analysis (OR: 2.95, 95% CI: 1.23-7.09, *p*=0.015). |
| Moryoussef *et al.* 2015(176) | Gastrointestinal stromal tumours/advanced or high risk resected/31 | Imatinib | | 39% | Martin *et al*. 2013 | No grade III-IV or DLT occurred in this study population. Sarcopenic patients more commonly experienced a grade I-II toxicity (100% vs. 73.7%, *p*=NS) and after 3 months of treatment, the mean number of toxicities per sarcopenic patient was significantly higher than in non-sarcopenic patients (4.1 vs. 1.7, *p* <0.01). |
| **Reference** | **Cancer type/stage/*n*** | **Treatment** | | **% Sarcopenic** | **Sarcopenia definition** | **Summary of findings related to toxicity** |
| Arrieta *et al.* 2015(171) | Non small cell lung cancer/Metastatic/84 | Afatinib | | 69% | Prado et al. 2008 | Sarcopenia alone was not found to be significantly associated with DLT or overall severe gastrointestinal toxicity. However, patients with lower LM and BMI <25 kg/m2 developed more DLT than patients with higher LM and BMI values (71.4% vs. 18.8%, *p*=0.0017). |
| Sjøblom *et al.* 2015(76) | Non small cell lung cancer/Stage IIIb-IV/153 | Gemcitabine and vinorelbine (VG) or Carboplatin and vinorelbine (VC) | | NR | NR | Patients with grade III-IV haematological toxicities (HT) received a higher dose of gemcitabine/kg LM (41.9 mg/kg vs. 38.2 mg/kg, *p*=0.006) and vinorelbine/kg LM (2.5 mg/kg vs. 2.3 mg/kg, *p*=0.009) than patients without grade III-IV HT. Higher doses of gemcitabine and vinorelbine per kg LM were significantly associated with grade 3-4 HT in multivariate analyses (OR=1.15, 95% CI: 1.01-1.29, *p*=0.018; OR 10.42, 95% CI: 1.36-80.0, *p*=0.024, respectively). No association was found between drug dose per kg/LM and dose reduction or early termination. |
| Rollins *et al.* 2015(68) | Pancreatic or distal cholangiocarcinoma/locally advanced or metastatic/97 | Gemcitabine based therapy | | 61% | Martin *et al*. 2013 | Sarcopenia and low MA had no effect upon the incidence of chemotherapy related toxicity or upon patient’s ability to complete the full course of palliative chemotherapy. |
| Ali R *et al.* 2016(92) | Colon Cancer/Mixed stages/138 | FOLFOX regimens | | NR | NR | In the French cohort (*n*=58) a cut point of 3.09 mg of oxaliplatin/kg LM was identified for developing toxicity. Patients with a dose above the cut point more commonly experienced DLT compared to patients below this cut point (44% vs. 0%, *p*<0.001). These findings were validated in an independent Canadian cohort of 80 patients. |
| Anandavadivelan *et al.* 2016(83) | Oesophageal and gastric cardia cancer/resectable/72 | NeoRes trial (Cisplatin and 5-Fluorouracil) | | 43% (14% sarcopenic obese) | Prado *et al*. 2008 | Patients with a DLT had lower SMM than those without DLT (47 kg vs. 51 kg, *p*=0.04). Sarcopenic pts showed a trend towards increased risk of DLT toxicity [OR=2.47, 95% CI: 0.88-6.93 (*p*<.10)]. Sarcopenic obese patients had a significant increased risk for DLT (OR=5.54, 95% CI: 1.12-27.44, *p*=0.04). |
| Chemama *et al.* 2016(77) | Colorectal/ Advanced/97 | Hyperthermic intraperitoneal chemotherapy (Oxaliplatin and Irrinotecan) | | 40% | Martin *et al*. 2013 | Sarcopenia patients experienced significantly more chemotherapy toxicities (57 vs. 26%, *p*=0.004) and especially neutropenia (36 vs. 17%, *p*=0.04) that their non sarcopenic counterparts. In MV analysis sarcopenia was the only parameter associated with the risk of chemotherapy toxicity (OR: 3.97, 95% CI: 1.52-10.39, *p*=0.005). |
| Cushen *et al.* 2016(66) | Prostate cancer/ Metastatic/63 | Docetaxel | | 47% | Martin *et al*. 2013 | More patients with both sarcopenia and low MA experienced a DLT compared with patients without both conditions (59.1% vs. 29.3%, *p*=0.021). SMI and MA were significantly lower in patients with grade I-II neutropenia compared to their counterparts (46.5 vs. 51.2 cm2/m2, *p*=0.005; 24.6 vs. 32.2 HU, *p*=0.044, respectively). |
| **Reference** | **Cancer type/stage/*n*** | **Treatment** | **% Sarcopenic** | | **Sarcopenia definition** | **Summary of findings related to toxicity** |
| Blauwhoff-Buskermolen *et al*. 2016(88) | Colorectal/metastatic/67 | Palliative chemotherapy (mixed chemo types) | | 57% | Martin *et al*. 2013 | SMI or MA were not associated with treatment modifications. |
| Shachar *et al.* 2017(72) | Breast cancer/Metastatic/40 | Taxane based chemotherapy (placitaxel, docetaxel, nab-paclitaxel) | | 58% | Martin *et al*. 2013 | Sarcopenic patients more commonly experienced grade III-IV toxicity compared with non-sarcopenic patients (57% vs. 18%, *p*=0.02). Toxicity related hospitalisations were also higher in sarcopenic patients (39% vs. 0%, *p*=0.005). Low skeletal muscle gauge (SMG=SMI x SMD) was associated with grade 3-4 toxicity (*p*=0.04), hospitalization (*p*=0.01) and time to treatment failure (*p*=0.03). |
| Sjøblom *et al.* 2017(93) | Non small cell lung cancer/Advanced (IIIb-IV)/424 | Carboplatin-Doublet (pemetrexed, gemcitabine or vinorelbine) | | NR | NR | Dose of non-platinum drugs per kg LM was associated with haematological toxicities (HT) in MV analysis. Taking mean dose per kg LM for each drug as a reference, a 1% increase was associated with an increased risk of grade III-IV HT [OR 1.03 (95% CI: 1.01-1.06) (*p*=0.004). Doses > 20% above and below mean almost doubled (OR = 1.93, 95% CI, 1.21-3.10) or halved (OR = 0.52; 95% CI, 0.32-0.83) the risk of grade 3/4 HT. |
| Cushen *et al.* 2017(56) | Renal cell carcinoma/Metastatic/55 | Sunitunib | | 33% | Prado *et al*. 2008 | Patients with the lowest skeletal muscle index (SMI)(<25th centile) compared with the highest SMI (>75th centile) experienced more DLT (92% vs. 57%, *p*=0.05) and experienced on average 5 vs. 2 toxicities (*p*=0.003). |
| Auclin *et al.* 2017(53) | Renal cell carcinoma/ Metastatic/124 | Everolimus | | 90% | Baumgartner *et al*. 1998 (CT converted DXA cut points) | No difference in Everolimus toxicity between terciles of SMI. |
| Palmela *et al.* 2017(81) | Gastric cancer/Locally advanced (stage II-III)/48 | Neoadjuvant chemotherapy (mixed standard chemo types) | | 23% and 10% sarcopenic obese | Sarcopenia defined using Martin *et al.* (2013) cut points + BMI >25 kg/m2 for sarcopenic obese. | Sarcopenic patients more commonly experienced DLT compared with non-sarcopenic patients (65% vs. 39%, *p*=0.181). Early termination of chemotherapy was associated with the presence of sarcopenia (64% vs. 28%, *p*=0.069) and sarcopenic obesity (100% vs. 28%, *p*=0.004). |
| Daly *et al*. 2017(4) | Melanoma/  Metastatic/84 | Ipilimumab | | 24% | Martin *et al*. 2013 | Sarcopenia and low MA were independantly associated with high grade adverse events (OR 5.34 (95% CI: 1.15-24.88, *p*=0.033 and OR: 5.23 (95% CI: 1.41-19.30, *p*=0.013, respectively. Low MA was associated specifically with high grade immune related adverse events (OR 3.57 (95% CI: 1.09-11.77, *p*=0.036). |
| **Reference** | **Cancer type/stage/*n*** | **Treatment** | | **% Sarcopenic** | **Sarcopenia definition** | **Summary of findings related to toxicity** |
| Shachar *et al.* 2017(82) | Breast cancer/Early stage (I-III)/151 | Anthracycline and taxane based chemotherapy | | NR | NR | Higher risk of grade III-IV toxicity in those with a low SMI (every 5-unit decrease in SMI: RR 1.29 (95% CI 1.10-1.53), *p*=0.002), low SMG (every 100 AU decrease: RR 1.09 (95% CI: 1.02-1.16), *p*=0.01) and low LM (every 5 kg decrease in lean body mass: RR 1.48 (95% CI: 1.15-1.89), *p*=0.002) on multivariate analysis. |
| Valentine H *et al.* 2017(79) | Melanoma/ Unresectable/68 | Anti PD-1 checkpoint inhibitors (Nivolumab or prembrolizumab) | | 19% sarcopenic & overweight | Below the median (<47.7 cm2/m2 for men and <37.1 cm2/m2 for women) | Among the 32 female patients, Patients who were both sarcopenic and overweight (BMI ≥25 kg/m2) experienced more early acute limiting toxicity than those without sarcopenia and a BMI ≥25 kg/m2 (50% vs. 7.7%, *p*=0.01). |
| Cespedes *et al.* 2017(2) | Colon/non metastatic/533 | Adjuvant FOLFOX | | - | Lowest sex specific tertile | Patients in the lowest tertile of muscle mass had higher odds of adverse chemotherapy outcomes while receiving FOLFOX. For early discontinuation OR 2.34 [(95% CI: 1.04 to 5.24), *p*=0.03]; for treatment delay OR 2.24 [(95% CI: 1.37 to 3.66), *p*=0.002) and for dose reduction OR 2.28 [(95% CI:1.19 to 4.36), *p*=0.01]. |

FP, Fluropyramidine; NR, Not recorded; HAI, hepatic arterial infusion; 5-FU, Flurouracil; MV, Multivariate; BMI, Body mass index; DLT, Dose Limiting Toxicity; LM, Lean Mass; AST, Aspartate Aminotransferase; CI, Confidence Interval; AUC, Area Under the Curve; SMI, Skeletal Muscle Index; SAT, Subcutaneous Adipose Tissue; VAT, Visceral Adipose Tissue; HT, Haematological Toxicity; MA, Muscle Attenuation; SMM, Skeletal Muscle Mass; SMG, Skeletal Muscle Gauge; SMD, Skeletal Muscle Density; OR, Odds ratio.