

# Exercise Medicine in the Management of Pancreatic Cancer

## A Systematic Review

### SUPPLEMENTAL DIGITAL CONTENT

<b>SUPPLEMENTAL TABLE 1.</b> Minimal Important Difference (MID) for Various Outcome Measures		
<b>Outcome Measures</b>	<b>Recommended MID Values</b>	<b>References</b>
Quality of life scales		
The 36-item Short Form Health Survey (SF-36)	Change in physical and mental composite score $\geq 5$ points	Ware et al, 1993 <sup>52</sup> ; Hammerlid et al. 2001 <sup>53</sup> ; Bunevicius, 2017 <sup>54</sup>
European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire Core module (EORTC QLQ-C30)	For either better or worse, 5-10 points = a little change; 10-20 points = moderate change; >20 points = very much change	King 1996 <sup>55</sup> ; Osoba et al, 1998 <sup>56</sup>
European Organization for the Research and Treatment of Cancer pancreatic cancer specific module (EORTC QLQ-PAN26)	Symptom and functional scales score = 5-9 points	Reni et al, 2019 <sup>57</sup>
Functional Assessment of Cancer Therapy- General questionnaire (FACT-G)	FACT-G total score = 4 points	Cella et al, 2002 <sup>59</sup>
Functional Assessment of Cancer Therapy- Hepatobiliary questionnaire (FACT-Hep)	FACT-Hep total score = 8-9 points	Steel et al, 2006 <sup>58</sup>
Physical function measures		
One repetition maximum (1RM) test	Leg extension 1RM = ~5kg; chest press 1RM = ~6kg	Oliveira et al, 2019 <sup>63</sup>
Grip strength dynamometry	5-6.5 kg (using a Jamar dynamometer)	Bohannon, 2019 <sup>66</sup>
Sit-to-stand (STS)	30 seconds STS: 2 repetitions; five-repetition STS: 1.7 seconds	Jones et al, 2013 <sup>64</sup> ; Zanini et al, 2018 <sup>65</sup>
6-minute walk test	14-30.5 meters	Bohannon et al, 2017 <sup>66</sup>
400-meter walk test	20-30 seconds	Kwon et al, 2009 <sup>69</sup>
Cardiopulmonary exercise testing (CPET)	maximal cycle exercise capacity = 4 (SD, 1) W or maximal oxygen uptake = ~0.04 (SD, 0.01) L/min	Puhan et al, 2011 <sup>67</sup> ; Puente-Maestu et al, 2016 <sup>68</sup>
10-meter walk test	Gait speed $\geq 0.16$ m/s (at comfort walking speed)	Tilson et al, 2010 <sup>70</sup>
Dynamic Gait Index (DGI)	1.8 (baseline DGI score < 21/24) and 0.6 (baseline DGI score $\geq 21/24$ ) points	Pardasaney et al, 2012 <sup>71</sup>
Cancer-related fatigue scales		
Functional Assessment of Chronic Illness Therapy-Fatigue scale (FACIT-F)	3 points	Cella et al, 2002 <sup>59</sup>
Multidimensional Fatigue Inventory (MFI)	2 points	Purcell et al, 2010 <sup>61</sup>
Fatigue visual analog scale (FVAS; 0-10)	-0.82 to -1.12 for improvement and 1.13 to 1.26 for worsening	Khanna et al, 2008 <sup>60</sup>
Psychological distress scales		
Hospital Anxiety and Depression Scale (HADS)	1.7 points	Lemay et al, 2019 <sup>62</sup>

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**SUPPLEMENTAL TABLE 2.** Electronic Search Strategy

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<b>Electronic Sources</b>	<b>Search Strategy Used</b>
PubMed	<b>#1:</b> (pancreatic neoplasms[MeSH Terms]) OR (pancreatic tumor* OR pancreatic cancer OR pancreatic exocrine tumor* OR pancreatic adenocarcinoma OR pancreatic ductal adenocarcinoma OR pancreatic endocrine tumor* OR pancreatic neuroendocrine tumor* OR islet cell tumor*) = <b>108,935</b> <b>#2:</b> ((exercise[MeSH Terms]) OR exercise therapy[MeSH Terms]) OR (physical activity OR sport OR resistance OR strength training OR weight training OR walking OR aerobic OR cardio OR endurance OR supervised OR home-based OR leisure*time) = <b>3,029,934</b> <b>#3:</b> (quality of life OR fatigue OR psychological OR patient-reported outcome OR well-being OR social OR mental health OR emotional OR physical OR physiological OR fitness OR functional ability OR muscle strength OR cardiovascular OR cardiopulmonary capacity OR cardiorespiratory OR balance OR mobility) = <b>11,199,035</b> <b>#4:</b> <b>#1 AND #2 AND #3 = 2524</b>
CINAHL Plus	<b>#1:</b> MJ pancreatic neoplasms OR (pancreatic tumor* OR pancreatic cancer OR pancreatic exocrine tumor* OR pancreatic adenocarcinoma OR pancreatic ductal adenocarcinoma OR pancreatic endocrine tumor* OR pancreatic neuroendocrine tumor* OR islet cell tumor*) = <b>11,470</b> <b>#2:</b> MJ exercise OR (physical activity OR sport OR resistance OR strength training OR weight training OR walking OR aerobic OR cardio OR endurance OR supervised OR home-based OR leisure*time) = <b>322,233</b> <b>#3:</b> quality of life OR fatigue OR psychological OR patient-reported outcome OR well-being OR social OR mental health OR emotional OR physical OR physiological OR fitness OR functional ability OR muscle strength OR cardiovascular OR cardiopulmonary capacity OR cardiorespiratory OR balance OR mobility = <b>1,242,849</b> <b>#4:</b> <b>#1 AND #2 AND #3 = 81</b>
PsycINFO	<b>#1:</b> MA pancreas AND MA neoplasms OR (pancreatic neoplasms OR pancreatic tumor* OR pancreatic cancer OR pancreatic exocrine tumor* OR pancreatic adenocarcinoma OR pancreatic ductal adenocarcinoma OR pancreatic endocrine tumor* OR pancreatic neuroendocrine tumor* OR islet cell tumor*) = <b>479</b> <b>#2:</b> MA exercise OR (physical activity OR sport OR resistance OR strength training OR weight training OR walking OR aerobic OR cardio OR endurance OR supervised OR home-based OR leisure*time) = <b>184,498</b> <b>#3:</b> quality of life OR fatigue OR psychological OR patient-reported outcome OR well-being OR social OR mental health OR emotional OR physical OR physiological OR fitness OR functional ability OR muscle strength OR cardiovascular OR cardiopulmonary capacity OR cardiorespiratory OR balance OR mobility = <b>2,830,547</b> <b>#4:</b> <b>#1 AND #2 AND #3 = 21</b>
Embase	<b>#1:</b> 'pancreas tumor'/mj = <b>18,225</b> <b>#2:</b> 'pancreatic neoplasms' OR 'pancreatic cancer' OR 'pancreatic exocrine tumor*' OR 'pancreatic adenocarcinoma' OR 'pancreatic ductal adenocarcinoma' OR 'pancreatic endocrine tumor*' OR 'pancreatic neuroendocrine tumor*' OR 'islet cell tumor*' = <b>85,656</b> <b>#3:</b> <b>#1 OR #2 = 97,155</b> <b>#4:</b> 'exercise'/mj = <b>116,431</b> <b>#5:</b> 'physical activity' OR sport OR resistance OR 'strength training' OR 'weight training' OR walking OR aerobic OR cardio OR endurance OR supervised OR 'home-based' OR 'leisure*time' = <b>1,871,855</b> <b>#6:</b> <b>#4 OR #5 = 1,934,324</b> <b>#7:</b> 'quality of life' OR fatigue OR psychological OR 'patient-reported outcome' OR 'well-being' OR social OR 'mental health' OR emotional OR physical OR physiological OR fitness OR 'functional ability' OR 'muscle strength' OR cardiovascular OR 'cardiopulmonary capacity' OR cardiorespiratory OR balance OR mobility = <b>6,565,671</b> <b>#8:</b> <b>#3 AND #6 AND #7 = 888</b>

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**SUPPLEMENTAL TABLE 2. (Continued)**

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Electronic Sources	Search Strategy Used
Cochrane Library	<p><b>#1:</b> MeSH descriptor: [Pancreatic Neoplasms] explode all trees = <b>1697</b></p> <p><b>#2:</b> (pancreatic tumor* OR pancreatic cancer OR pancreatic exocrine tumor* OR pancreatic adenocarcinoma OR pancreatic ductal adenocarcinoma OR pancreatic endocrine tumor* OR pancreatic neuroendocrine tumor* OR islet cell tumor*) = <b>5808</b></p> <p><b>#3:</b> #1 OR #2 = <b>6006</b></p> <p><b>#4:</b> MeSH descriptor: [Exercise] explode all trees = <b>23,147</b></p> <p><b>#5:</b> (physical activity OR sport OR resistance OR strength training OR weight training OR walking OR aerobic OR cardio OR endurance OR supervised OR home-based OR leisure*time) = <b>145,353</b></p> <p><b>#6:</b> #4 OR #5 = <b>150,849</b></p> <p><b>#7:</b> (quality of life OR fatigue OR psychological OR patient-reported outcome OR well-being OR social OR mental health OR emotional OR physical OR physiological OR fitness OR functional ability OR muscle strength OR cardiovascular OR cardiopulmonary capacity OR cardiorespiratory OR balance OR mobility) = <b>433,020</b></p> <p><b>#8:</b> #3 AND #6 AND #7 = <b>251</b></p>
Web of Science (All databases)	<p><b>#1:</b> TS = (pancreatic neoplasms OR pancreatic tumor* OR pancreatic cancer OR pancreatic exocrine tumor* OR pancreatic adenocarcinoma OR pancreatic ductal adenocarcinoma OR pancreatic endocrine tumor* OR pancreatic neuroendocrine tumor* OR islet cell tumor*) = <b>171,288</b></p> <p><b>#2:</b> TS = (exercise OR physical activity OR sport OR resistance OR strength training OR weight training OR walking OR aerobic OR cardio OR endurance OR supervised OR home-based OR leisure*time) = <b>4,446,426</b></p> <p><b>#3:</b> TS = (quality of life OR fatigue OR psychological OR patient-reported outcome OR well-being OR social OR mental health OR emotional OR physical OR physiological OR fitness OR functional ability OR muscle strength OR cardiovascular OR cardiopulmonary capacity OR cardiorespiratory OR balance OR mobility) = <b>12,901,845</b></p> <p><b>#4:</b> #1 AND #2 AND #3 = <b>2731</b></p>

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