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## Physical activity and the microbiota in cancer- what do we already know?

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**Background:** Higher physical activity (PA) levels are associated with improved upper gastrointestinal (UGI) cancer outcomes. One possible mechanism that may enable better optimisation of PA is its effects on the gut microbiota (GM), and tumour/oral microbiomes. We aimed to identify gaps in evidence on the relationships between PA and 1) microbiota in cancer, and 2) UGI cancer and related microbiomes.

**Methods:** We identified keywords that enabled the finalised search strategy of English manuscripts using electronic databases (EMBASE, Pubmed, Web of Science, CINAHL) published up to 11/4/2025. The scoping review followed the PRISMA-ScR Checklist.

**Results:** Reviewing references and citations resulted in a total of 1,475 eligible studies. Initial screening and exclusion criteria revealed 44 full-text papers. Most studies were randomized controlled trials (n=26 of which 22 are protocols), followed by cohort prospective observational interventions (n=10 of which 1 is a protocol) and quasi experimental (n= 5 of which 2 are protocols). Finally, there was one literature review, one bibliometric analysis and one Mendelian randomization analysis. Within intervention/observation studies, tumours included: mixed solid tumours (n=6) including 2 studies with UGI, breast (n=13), colorectal (n=7), lung (n=2), melanoma (n=3), prostate/testicular (n=6), preclinical (n=3) and preclinical/human breast (n=1).

**Conclusions:** Although evidence is emerging describing the relationship between PA and GM in cancer, other key microbiomes in cancer patients have not been widely explored. Until this gap in the knowledge is addressed, improvements in cancer outcomes from PA will not progress. Future research should consider different tumour types, microbiomes, PA interventions, diet and other potential influencing factors.

### Keywords

Microbiota/ cancer/ physical activity/ upper gastrointestinal

### Conflict of Interest & Ethical Approval

yes

### Abstract submitters declaration

yes

**Author:** VEAL, Isla (Guy's and St Thomas'Foundation Trust, Department of Physiotherapy, London, UK.)

**Co-authors:** Mr MCCOULL, Scott (NHS Lanarkshire); Dr BARTLETT, David (FHMS, University of Surrey, Guildford, UK); Mrs PEAT, Nicola (Guy's and St Thomas'Foundation Trust, Department of Physiotherapy, London, UK); ANNELS, Nicola (FHMS, University of Surrey, Guildford, UK); Prof. FRAMPTON, Adam (HPB Surgical Unit,

Royal Surrey NHS Foundation Trust, Guildford, UK); Prof. ARMES, Jo (FHMS, University of Surrey, Guildford, UK)

**Presenter:** VEAL, Isla (Guy's and St Thomas' Foundation Trust, Department of Physiotherapy, London, UK.)

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