



Universitätsmedizin Essen
Universitätsklinikum

Schould exercise be part of usual cancer care in
AYAs?

Dr. Miriam Götte

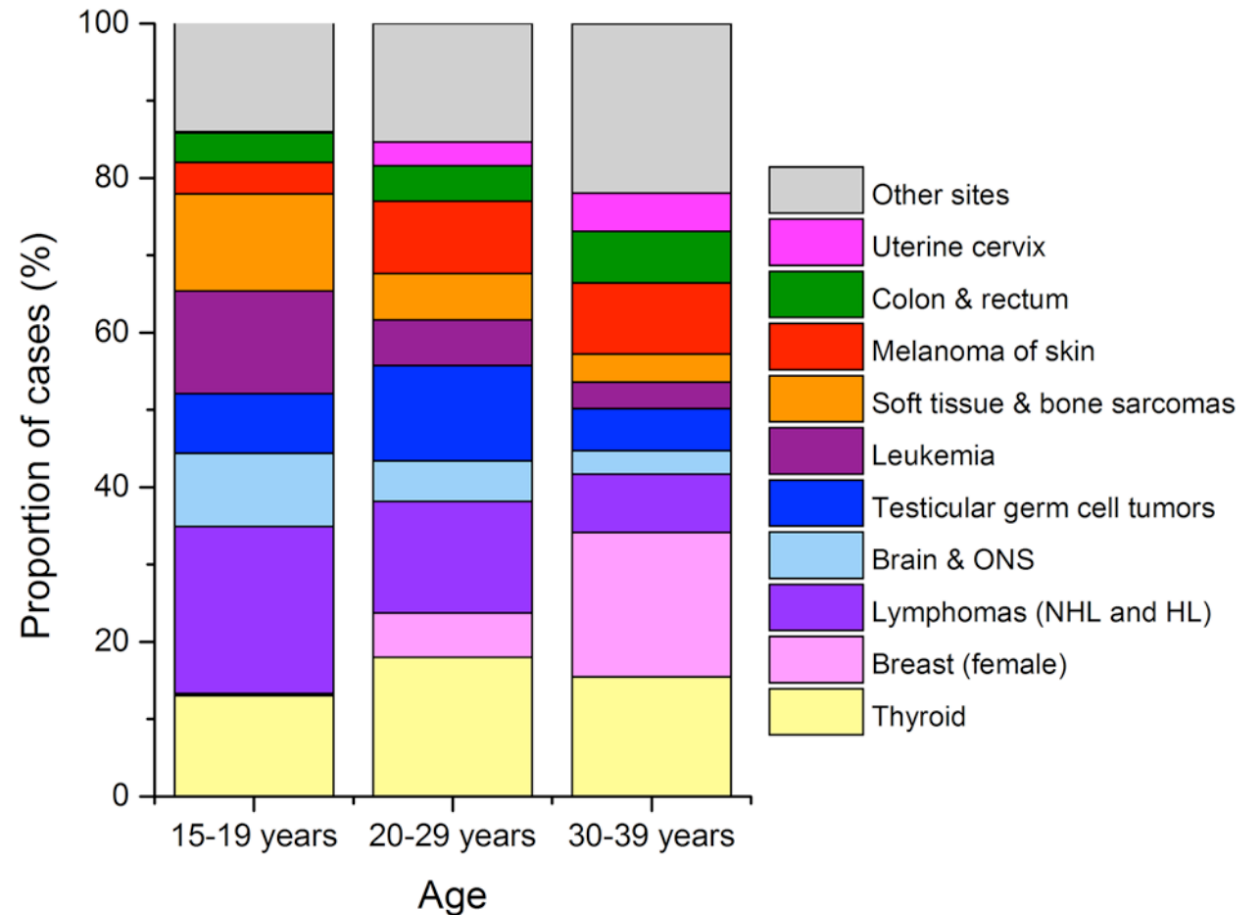
1. Background
2. State of the Art / evidence
3. Exercise preferences
4. Implementation
5. Ongoing research
6. Counselling / support

AYA – in exercise trials

Diagnosed with cancer
between the ages of 15 to 39
years old (~15-39 years)

- Definition of e.g., National Cancer Institute
- Account for ~ 5% of cancer diagnoses

Often together with survivors
with a history of cancer during
childhood & adolescence



Miller et al. CA CANCER J CLIN 2020;70:443–459

Background: Physical inactivity

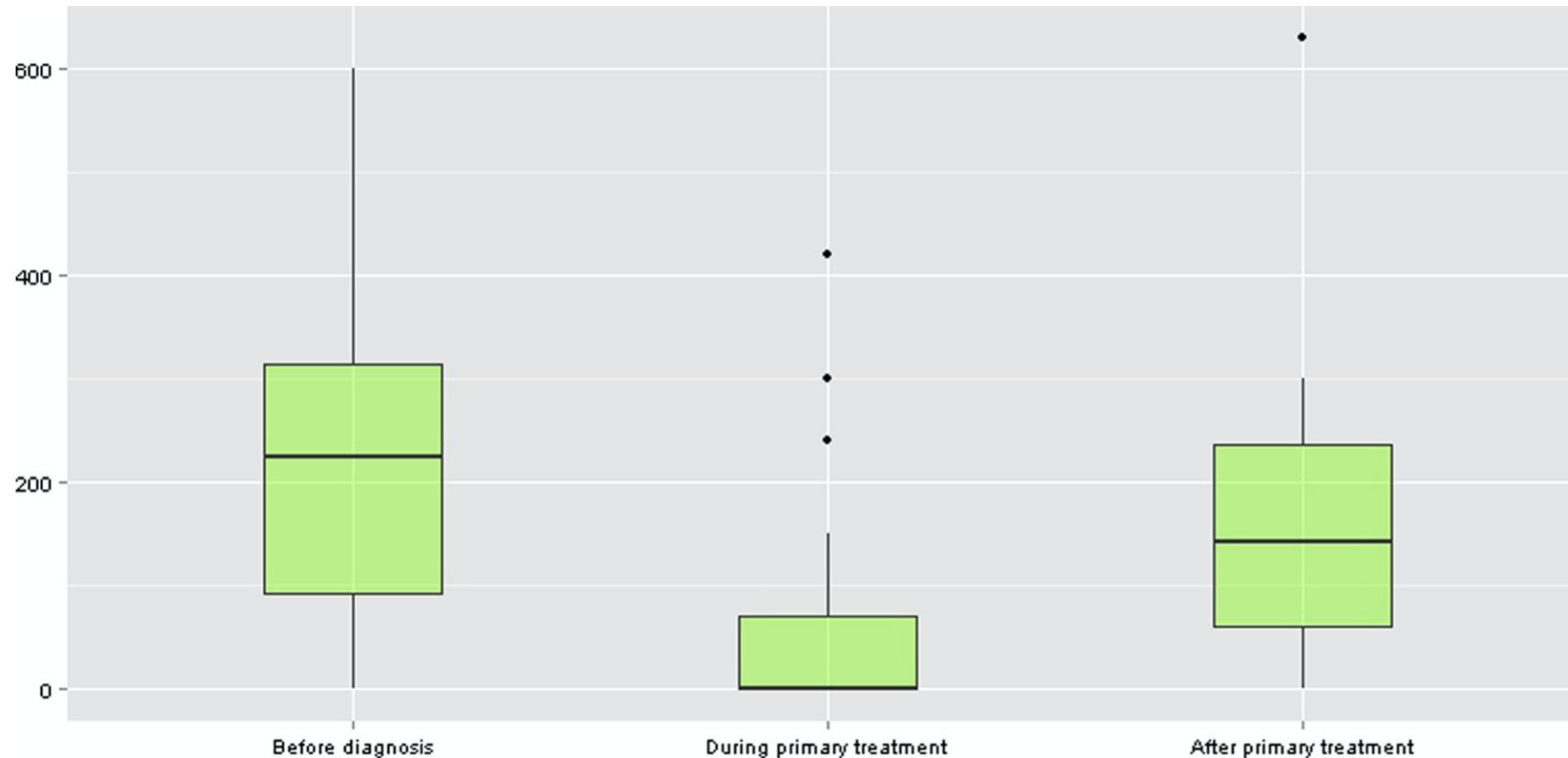
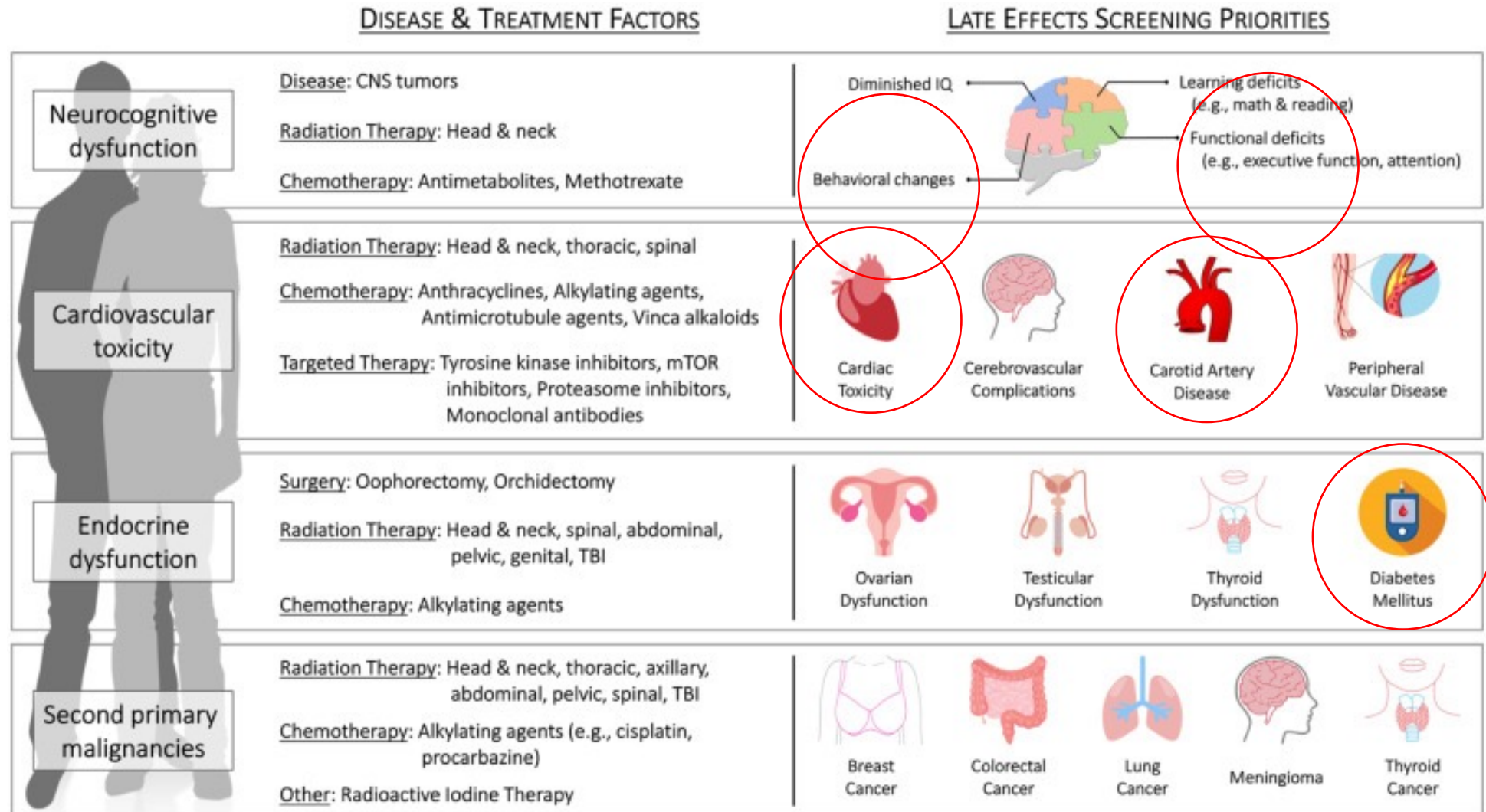


Fig. 2 Physical activity (minutes per week) before diagnosis, during primary treatment and after primary treatment

Background: Treatment sequelae



How to get
moving?



Review and communicate evidence

Evidence in adult cancer patients
Schmitz et al. CA CANCER J CLIN 2019;0:1–17 (ACSM)

TABLE 2. Level of Evidence for the Benefit of Exercise on Cancer-Related Health Outcomes¹⁰

STRONG EVIDENCE ^a	MODERATE EVIDENCE	INSUFFICIENT EVIDENCE
Reduced anxiety	Sleep	Cardiotoxicity
Fewer depressive symptoms	Bone health (for osteoporosis prevention, not bone metastases)	Chemotherapy-induced peripheral neuropathy
Less fatigue		Cognitive function
Better QOL		Falls
Improved perceived physical function		Nausea
No risk of exacerbating upper extremity lymphedema		Pain
		Sexual function
		Treatment tolerance

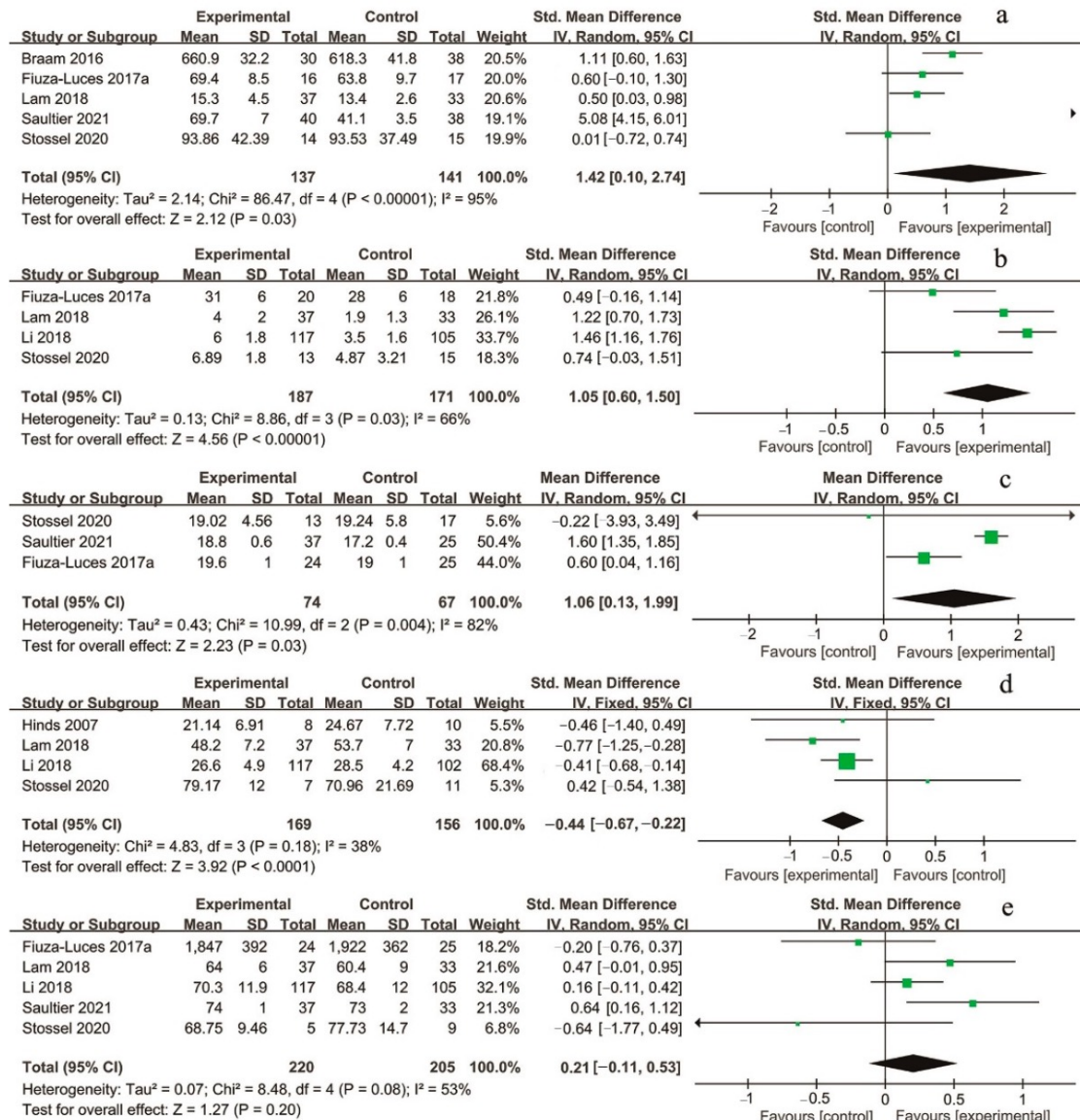


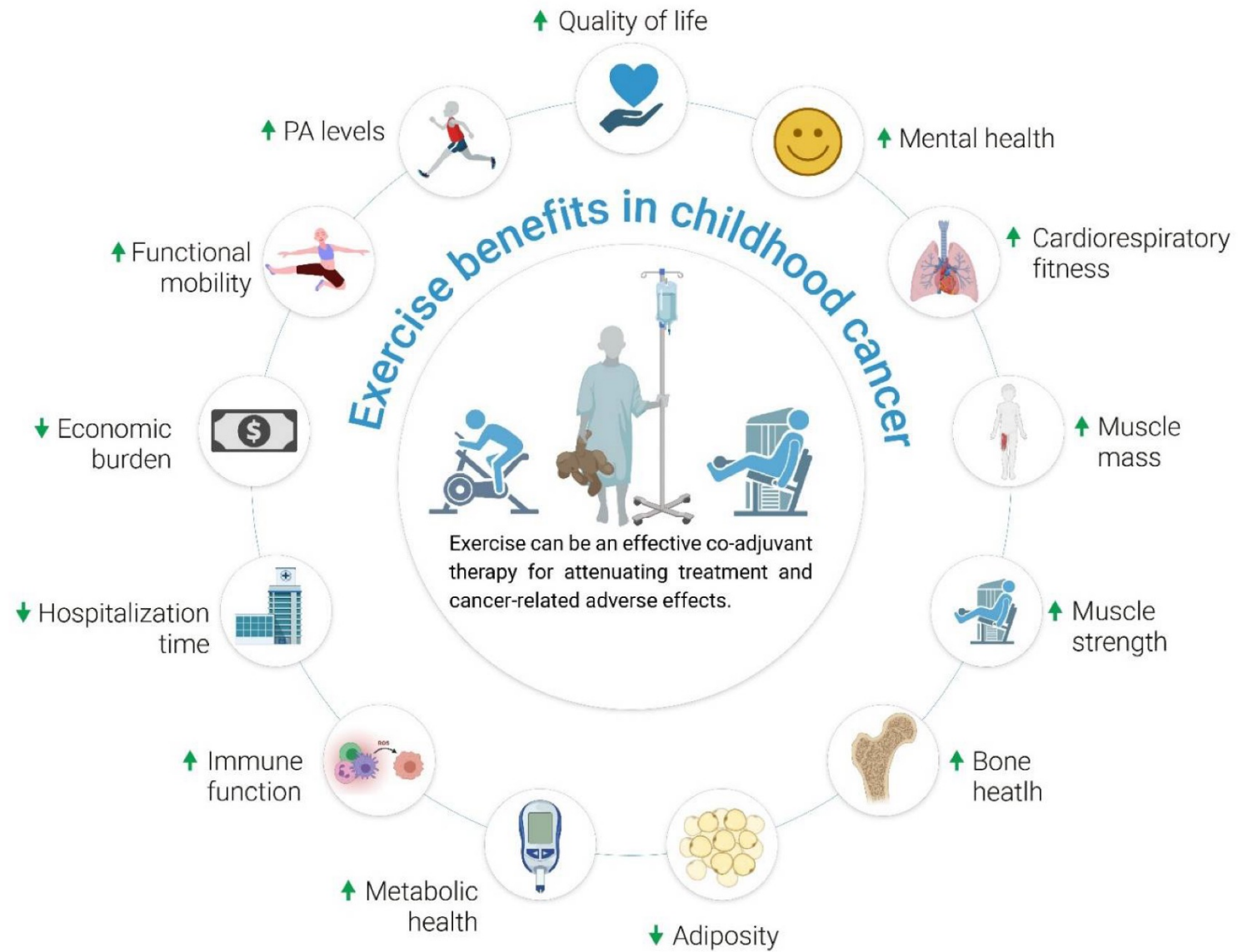
Figure 3. Meta-analyses of the effect of supervised exercise interventions on (a) muscle strength, (b) level of daily physical activity, (c) BMI, (d) fatigue, and (e) QoL.

And in pediatric oncology?

Supervised exercise interventions significantly improved **muscle strength** (standardized mean difference (SMD) = 1.42, $p = 0.03$), level of daily physical activity (SMD = 1.05, $p < 0.001$), body mass index (BMI) (mean difference (MD) = 1.06, $p = 0.03$), and **fatigue** (SMD = -0.44, $p < 0.001$)

But no statistical significance in the quality of life (QoL) (SMD = 0.21, $p = 0.20$).

Shi et al. 2022, Children



The Benefit of Physical Activity in Adolescent and Young Adult Cancer Patients During and After Treatment: A Systematic Review

Claire Munsie, MSc,¹⁻³ Jay Ebert, PhD,¹ David Joske, MD,³ and Timothy Ackland, PhD¹

Evidence in AYA patients?

Cancer and its associated therapies can severely impact the physical and psychosocial functioning of adolescent and young adults (AYAs), both during treatment and well into survivorship. Physical activity during and after cancer treatment could be beneficial to the AYA population, although this cohort has received little scientific attention. A systematic search of the literature was conducted to investigate current exercise interventions in AYA-specific populations. Studies were eligible for inclusion if >50% of the study population was aged between 15 and 25 years and the study included a physical activity intervention during or after cancer treatment. Studies were critically appraised using the Cochrane Risk of Bias tool. Six articles were identified as meeting the criteria, of which 2 were nonrandomized controlled studies and 4 were pilot studies, comprising a total of 135 AYA participants. The quality of studies was variable across all assessed domains. Direct comparison on intervention outcomes was not possible due to the heterogeneity of the studies; however, trends emerged on the feasibility, acceptability, and potential positive impact of physical activity in this cohort. This review highlights the lack of high-quality studies aimed to improve physical and psychosocial functioning in AYA patients across the cancer continuum. Physical activity interventions in this cohort "appear to be feasible;" however, larger randomized controlled trials are warranted to investigate the direct impact of interventions on health outcomes in this cohort.

Evidence of reviews is low +
No exercise guidelines for AYAs exist

- evaluate exercise preferences and needs
 - implement exercise programs
 - conduct more research
 - support and counselling / NAOK
-

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Preferences for exercise and physical activity support in adolescent and young adult cancer survivors: a cross-sectional survey

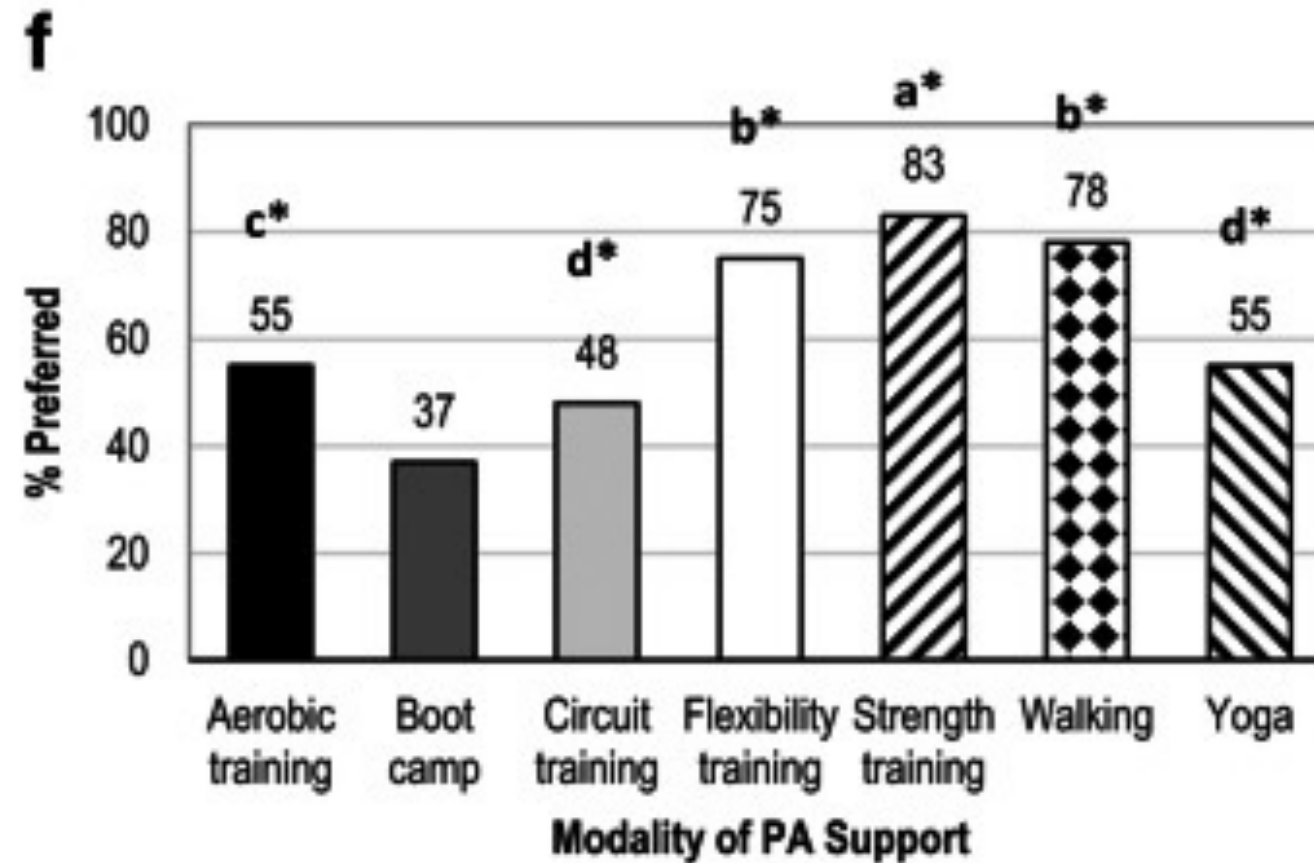
Scott C. Adams^{1,2,3}  · Anika Petrella³ · Catherine M. Sabiston³ · Madison F. Vani³ · Abha Gupta^{4,5,6} · Linda Trinh³ · Andrew G. Matthew^{4,6} · Robert J. Hamilton^{6,7} · Daniel Santa Mina^{3,4,6}

Evaluate exercise preferences and needs

N=318 AYAs, cancer diagnosis between 18-39 years, survey

- 40% not meeting PA guidelines
- 5% reported engagement in cancer PA support services
- 78% wanted PA support
- 70% wanted to increase PA levels
- Interventions should be supervised (82%) and home-based (79%)

Evaluate exercise preferences and needs



Evaluate exercise preferences and needs

- N=80, adolescents with cancer

Table 3 Self-Reported Physical Activity Preferences

PA preference	% of respondents
Who do you like to be active with?*	
<input checked="" type="checkbox"/> Friends	97
Siblings	52
Parents	41
Yourself	38
Teens on or off cancer Rx	7
How do you prefer to be active?	
<input checked="" type="checkbox"/> Recreational or daily activities	55
Specific exercise programs	3
No preference	41
When do you prefer to exercise?	
Afternoon	28
Evening	28
Morning	3
No preference	41
Where do you like to be active?*	
<input checked="" type="checkbox"/> Home	76
School	65
Fitness club	40
Hospital	3
PT clinic	0

*Participants were able to select more than one answer.

PA = physical activity; Rx = treatment; PT = physiotherapy.

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Implement exercise programs

Example from University Hospital
Essen

→ AYA cancer ward:

9 beds, ~16-35 years, focus on
sarcoma patients

Implementation at University Hospital Essen, Germany

Acute treatment
6-18 months

Maintenance/Aftercare
6-12 months

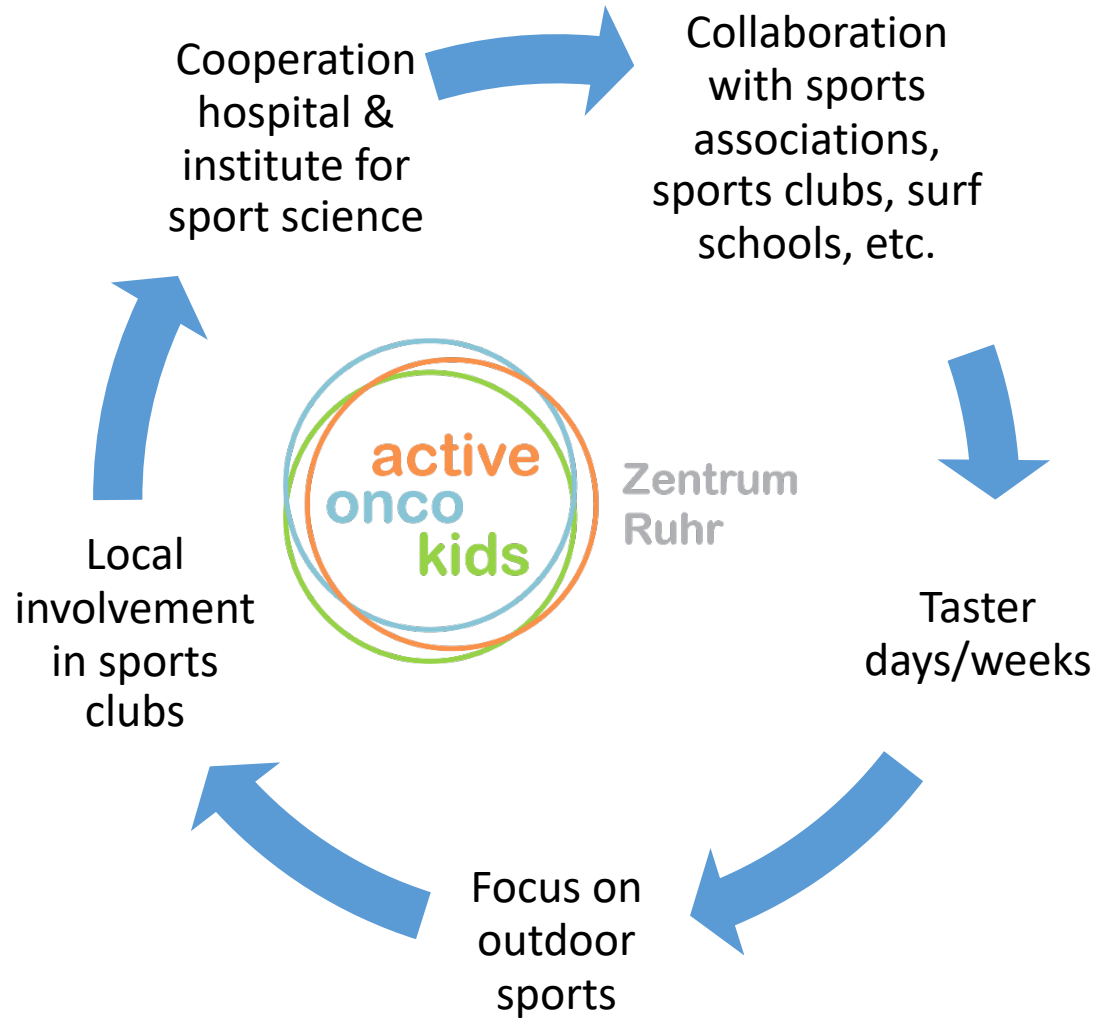
Survivorship/Palliative care
12 months - years

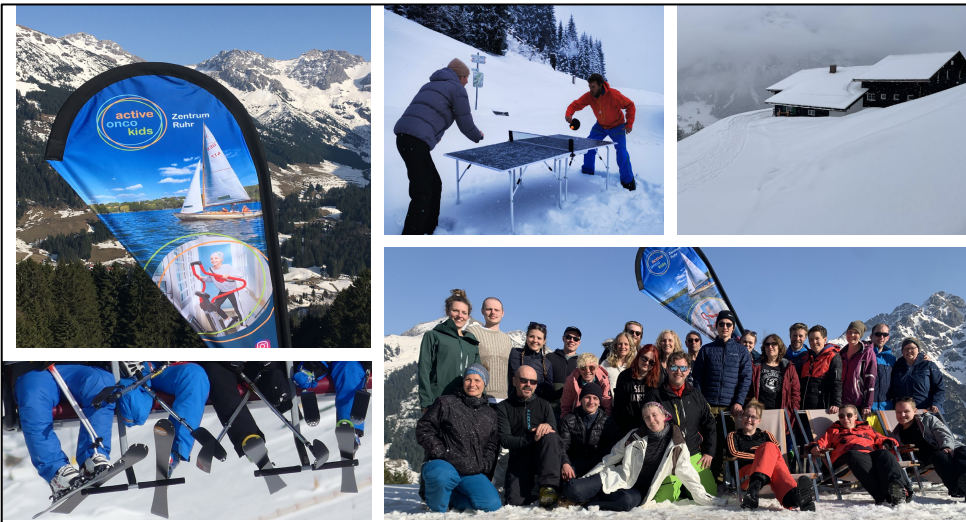
Individualized supervised exercise
(Age-appropriate, motivating, targeted)
*2-5x/week, 20-60 min, 1:1 supervision
during in-patient stay*

Taster days, aftercare sports groups, sports camps and reintegration
(Trying out sports and practicing them throughout life)

Counselling, including parents
(Information, recommendations, participation)

Taster days, aftercare sports groups, sports camps and reintegration (Trying out sports and practice them throughout life)





JUNGE LEUTE SKIFREIZEIT 2023

21.01. - 28.01.2023 | 6 Skitage

- Skigebiet: Kleinwalsertal, Walmendinger Horn und Heuberg – www.zaferna.de
- Gruppenunterkunft in gemütlichem Selbstversorgerhaus mit Kochteam direkt an der Skipiste
- 300 Euro Eigenanteil pro Person
- Inkl. An- & Abreise im Bus, Skiausrüstung nach Bedarf und Skikursen in Kleingruppen
- Après-Ski an der Schneebar der Zaferna-Hütte und gemütliches Beisammensein, Austauschen und Spieleabende für alle die Lust haben

Für Jugendliche und junge Erwachsene (ab 16 J.) nach einer Krebserkrankung + Buddies. Begleitet werdet Ihr durch ein multiprofessionelles Team des Uniklinikums Essen und das Skiteam der Fakultät für Sportwissenschaft der Ruhr-Universität Bochum. Die Teilnahme im direkten Anschluss an die intensive Therapie ist möglich.

Für alle, die schon dabei waren, bieten wir mit unserem Kooperationspartner SkiBo Tours & Sports folgende Option in den Osterferien an:

08.04. - 15.04.2023 Familienfahrt nach Valmorel, Frankreich

- Ansprechpartner vom Netzwerk ActiveOncoKids ist vor Ort
- 7 Übernachtungen im Apartment (Selbstverpflegung), inklusive Endreinigung
- 360 Euro pro Person (inkl. 6-Tages Skipass (Kinderermäßigung 0-12 Jahren: 130 €))
- Kinderskikurse für Einsteiger und Fortgeschrittene zubuchbar (130 Euro)

Anmeldung & Rückfragen an:

Dr. Miriam Götte | 0201-723-8083 | sporttherapie-kik3@uk-essen.de

Wir freuen uns auf Euch!

Patients + friends/siblings

Handicap skiing possible

Interdisciplinary team

Evidence of reviews is low +
No exercise guidelines for AYAs exist

- evaluate exercise preferences and needs
- implement exercise programs
- conduct more research
- support and counselling / NAOK

Conduct more research

Supportive Care in Cancer (2022) 30:8159–8171
<https://doi.org/10.1007/s00520-022-07217-w>

ORIGINAL ARTICLE



A randomised controlled trial investigating the ability for supervised exercise to reduce treatment-related decline in adolescent and young adult cancer patients

Claire Munsie^{1,2,3} · Jay Ebert¹ · David Joske^{3,4} · Timothy Ackland¹

Received: 28 September 2021 / Accepted: 9 June 2022 / Published online: 6 July 2022
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Abstract

Introduction Exercise is recognised as integral in mitigating a myriad negative consequences of cancer treatment. However, its benefit within adolescent and young adult (AYA) cancer cohorts remains relatively under researched, and caution should be taken in extrapolating outcomes from adult and paediatric populations given AYA distinctly different physiological and psychosocial contexts. This study sought to evaluate the impact of an exercise intervention on mitigating the expected decline in fitness, strength, physical functioning, and quality of life (QOL) in AYA undergoing cancer treatment.

Methods This prospective, randomised controlled trial (FiGHTINGF!T) allocated 43 participants (63% male, mean age 21.1 years) to a 10-week, multimodal, bi-weekly exercise intervention (EG) or control group (CG) undergoing usual care. Pre- and post-intervention assessments included cardiopulmonary exercise tests, one-repetition maximum (1RM) strength, functional tests, and QOL patient-reported outcome measures. Data were analysed via linear mixed models and regression.

Results While no significant group differences ($p > 0.05$) were observed, neither group significantly declined ($p > 0.05$) in any outcome measure over the 10-week period. No significant ($p > 0.05$) strength or functional improvements were observed in the CG, though the EG demonstrated significant improvements in their 1RM leg press ($p = 0.004$) and chest press ($p = 0.032$), maximal push ups ($p = 0.032$), and global QOL ($p = 0.011$). The EG reported a significant increase in fatigue ($p = 0.014$), while the CG reported significant positive changes in anxiety measures ($p = 0.005$).

Conclusion The exercise intervention produced superior improvements in strength and global QOL, compared with the CG. Regardless of group allocation, enrolment in the exercise study appeared to mitigate the treatment-related decline expected in AYA undergoing cancer treatment.

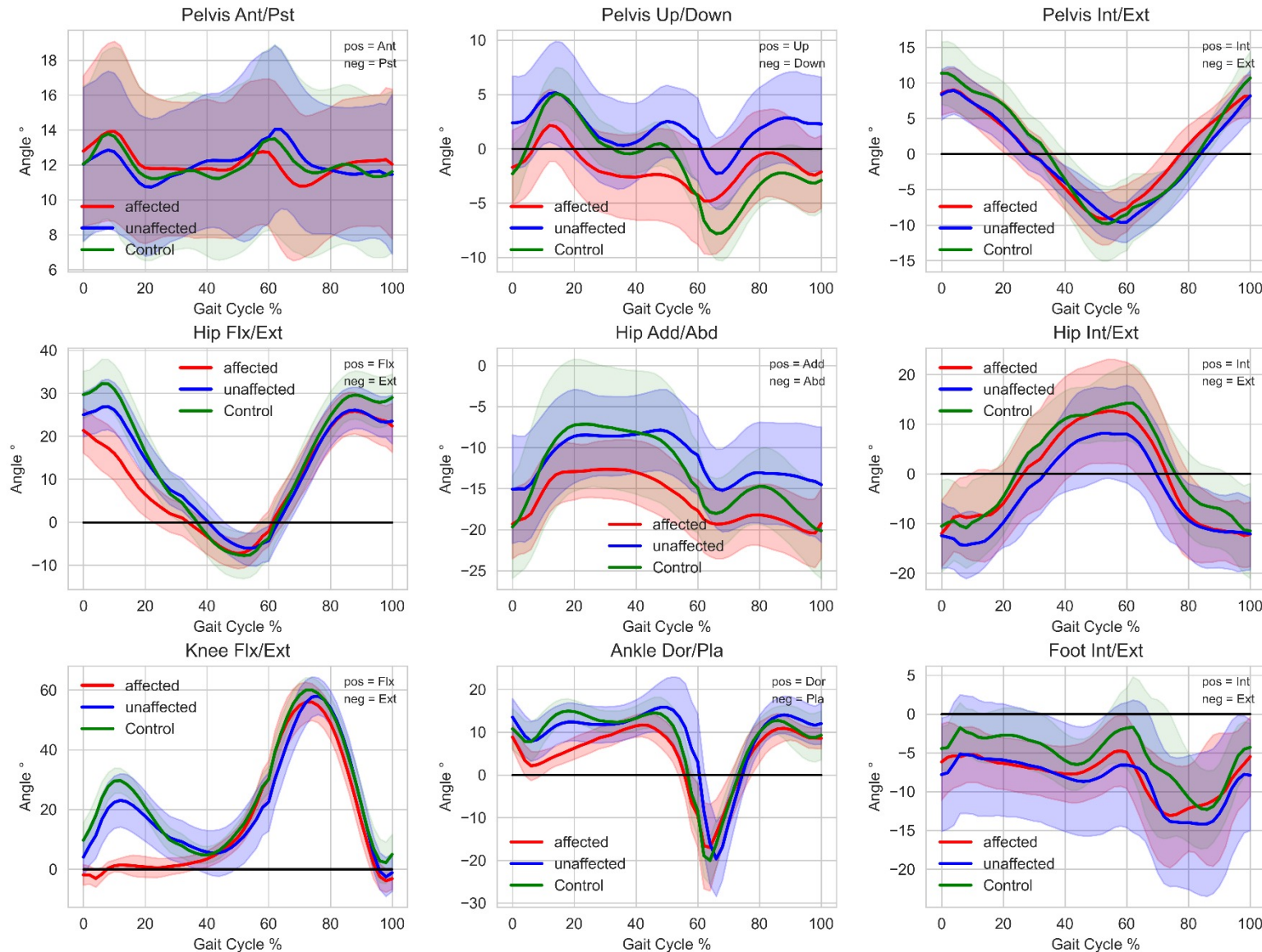
proGAIT trial

Purpose: To evaluate a personalized exercise program to improve gait quality in adolescents and young adults with tumor endoprosthesis around the knee.

Methods

- 15-39 years old, tumor endoprosthesis of the knee joint, >1 year post surgery.
- RCT, Individualized online exercise program vs. no intervention for 8 weeks.

Results proGAIT



The exercise intervention had small to medium positive effects on

- **gait score GDI** $|d|=0.50$ (unaffected leg),
 $|d|=0.24$ (affected leg)
- **subjective functional scores TESS** $|d| = 0.74$ and **MSTS** $|d| = 0.49$ and
- **functional tests TUG** and **TUDS** $|d| = 0.61$ and $|d| = 0.52$

YOUEX

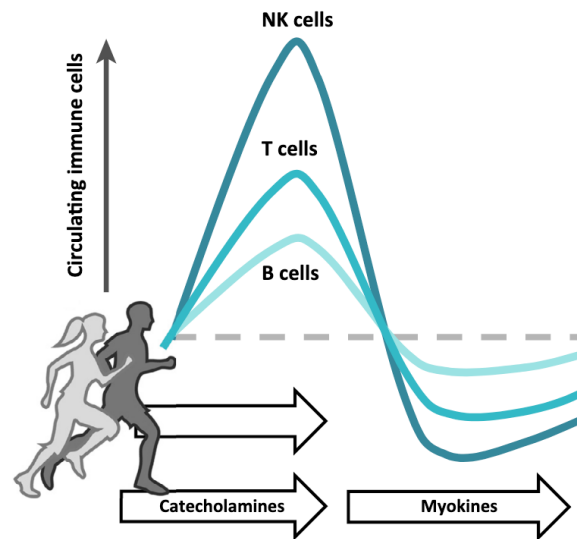


-
- Exercise study in Heidelberg, Essen, Berlin, Cologne
 - Patient preference-based non-randomized, longitudinal, pre-post exercise intervention, offering three different exercise module (M1 online supervised group-based; M2: online unsupervised; M3: in-person supervised)
 - Patients aged 18–39 years, cancer diagnosis within the past five years

Acute effects of exercise

- Immune response to a single exercise boost of AYA patients 15-29 years
- HIIT Training
- Compare immune response with healthy adults

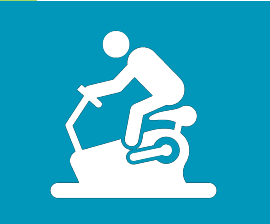
→ Regular (chronic) exercise vs. acute exercise (what happens short term?)



ACTIVE-Studie



TEILNEHMER*INNE
GESUCHT_N



» Ziel der Studie



Es ist bekannt, dass sich regelmäßige Bewegungstherapie während einer Krebserkrankung positiv auf das Wohlbefinden, die Lebensqualität, Fatigue und körperliche Funktionen auswirkt. Es ist jedoch erst wenig über die akuten/direkten Wirkungen beim Sport bekannt. In der ACTIVE-Studie wollen wir untersuchen wie sich Immunzellen bei einer Intervalleinheit auf dem Fahrrad-Ergometer bei Jugendlichen und jungen Erwachsenen während der onkologischen Akuttherapie verhalten.

Dafür suchen wir Dich und Sie für eine einmalige Einheit auf dem Fahrradergometer! Jedes Fitnesslevel ist herzlich willkommen und ausdrücklich erwünscht. Alle Einheiten werden professional angeleitet und betreut. Bei Interesse erhalten Sie eine individuelle Auswertung.

» Studieninformationen



Teilnehmer*innen	Zwischen 15-29 Jahren Aktuell in Behandlung mit Chemotherapie
Erkrankungen	Alle Tumorerkrankungen
Dauer	Ca. 1,5-2h
Inhalte	Einmalige Intervalleinheit auf dem Fahrrad-Ergometer, Schwierigkeit je nach individuellem Leistungsstand. Blutentnahme vor, direkt nach und eine Stunde nach Ende der Ausdauereinheit
Kosten	Kostenfrei

» Haben wir Ihr Interesse geweckt?
Nehmen Sie gerne Kontakt zu uns auf!

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Evidence of reviews is low +
No exercise guidelines for AYAs exist

- evaluate exercise preferences and needs
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Support and counselling / NAOK

- How can I integrate movement into my everyday life?
- What are feasible and safe sports with endoprosthesis?
- Which sports offers are available for my target group?
- Skiing, surfing, dancing with handicap?
- Which exercises can I use to reduce my polyneuropathy?

Structure

- Working group in *Gesellschaft für Pädiatrische Hämatologie und Onkologie* (GPOH)
- Steering group, n=7
- Interdisciplinary advisory board, n=21



Tasks/offers

- Counselling of patients, clinics, sport clubs, teachers, ...)
- Implementation of exercise programs
- Scientific projects
- Workshops / training courses

Network ActiveOncoKids

Scopes	Physical activity support		Policy change	Scientific evidence
Aims	Strengthen physically active behavior	Implement exercise programs during acute care and aftercare	Establish sustainable structures and exercise guidelines	Initiate and collaborate in exercise research projects
Actions	Advise and empower patients, survivors, and parents on how to be physically active during and after treatment	Implement exercise programs in acute cancer clinics and individually advise medical professionals	Develop and regularly update exercise guidelines and participate in other guidelines	Initiate multicentric studies with larger study cohorts to assess benefits and risks
	Re-integrate patients into sport structures after treatment considering possible late effects and sequelae	Modification of structures and facilities to enable exercise programs in acute cancer clinics (e.g., exercise rooms, building local networks)	Collaborate with health insurance companies to finance exercise therapy	Evaluate exercise effects on specific outcomes and within special groups (e.g., SCT, palliative care) to define training recommendations
	Develop training brochures, flyers, videos, sport camps, and online-courses	Advise physical education teachers, club coaches, and sport clubs	Remove unfounded barriers and restrictions to movement through interdisciplinary cooperation	Harmonize training and diagnostic measures (e.g., to assess physical activity and performance)

→ Implement pediatric exercise oncology as usual care for children and adolescents with cancer ←

Network ActiveOncoKids for AYAs

- Individual support: exercise support / counselling / integration → individual level
- Referral to AYA specific offers AND/OR exercise support non-cancer specific

HP: <http://activeoncokids.de/>
E-Mail: kontakt@activeoncokids.de
Tel: 0201 723 6563



Should
exercise be
part of
usual
cancer care
in AYAs?



- Evidence for effectiveness limited
 - Evidence from children & adults seem to be valid for AYAs as well
 - Existing programs show feasibility and safety
 - Vulnerable group with special needs
- What we need: Translational practice & research projects



Netzwerk

Thank you for your attention!

Contact

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