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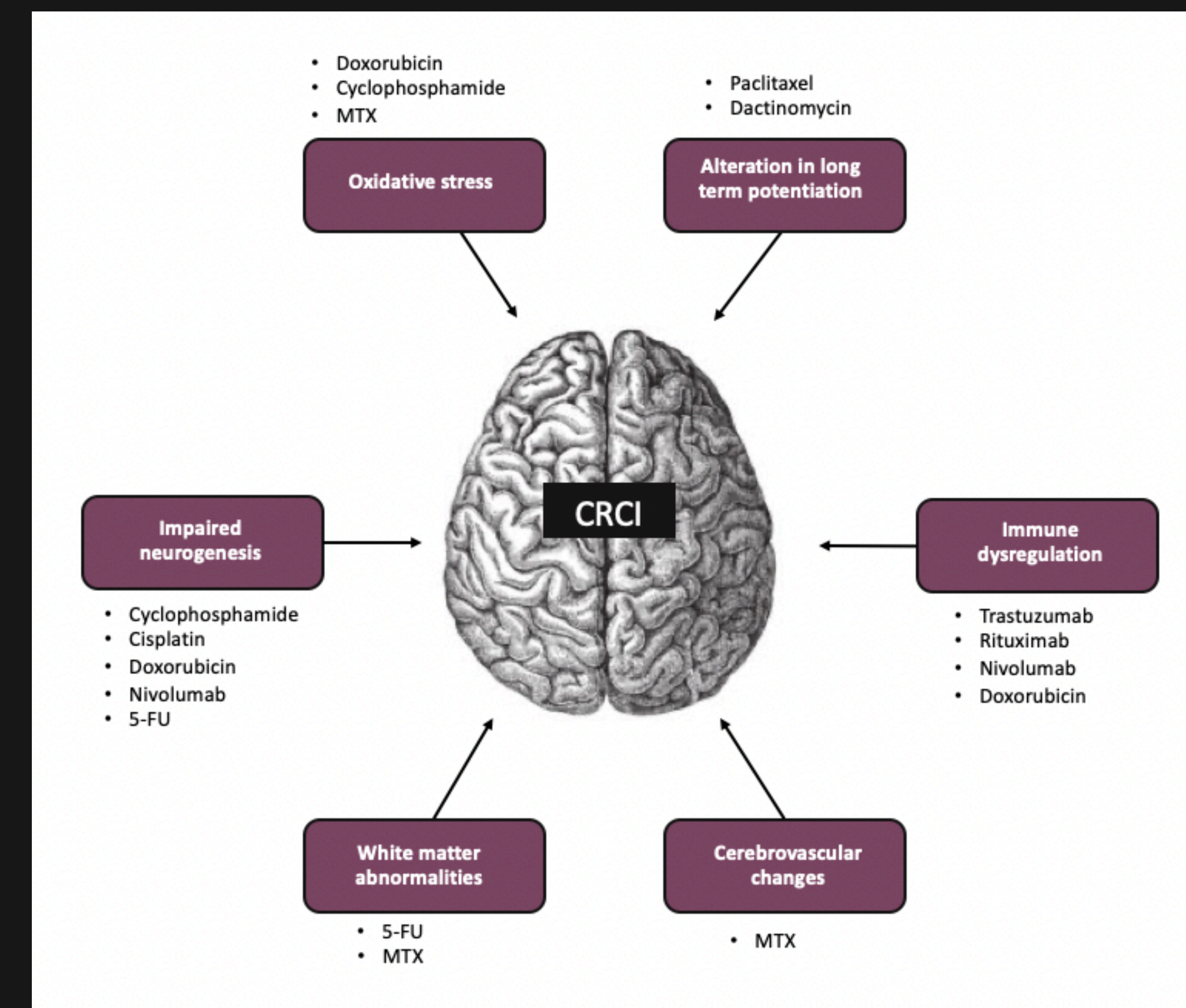
Which non-pharmacologic interventions are most effective at addressing chemotherapy related cognitive impairment (CRCI) in adolescent and young adult cancer survivors?

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Introduction

- Often presents during and after treatment with memory impairment, concentration deficits, and depression
- 25.75% prevalence in adolescent and young adult (AYA) cancer survivors
- Significantly impacts school, work, daily activities, and overall quality of life
- Mechanisms associated with chemotherapeutics:



Purpose

To review present day methods of addressing CRCI in adolescents and young adult non-CNS cancer survivors.

Methods

Inclusion criteria:

1. Peer reviewed article
2. Published in English
3. Published between January 2002 to February 2023
4. Chemotherapy recipients with non-CNS cancer
5. Participants in the age ranges of 14-39 years with cognitive changes during/ after chemotherapy
6. Cognition as one of the outcomes
7. Non-pharmacologic intervention

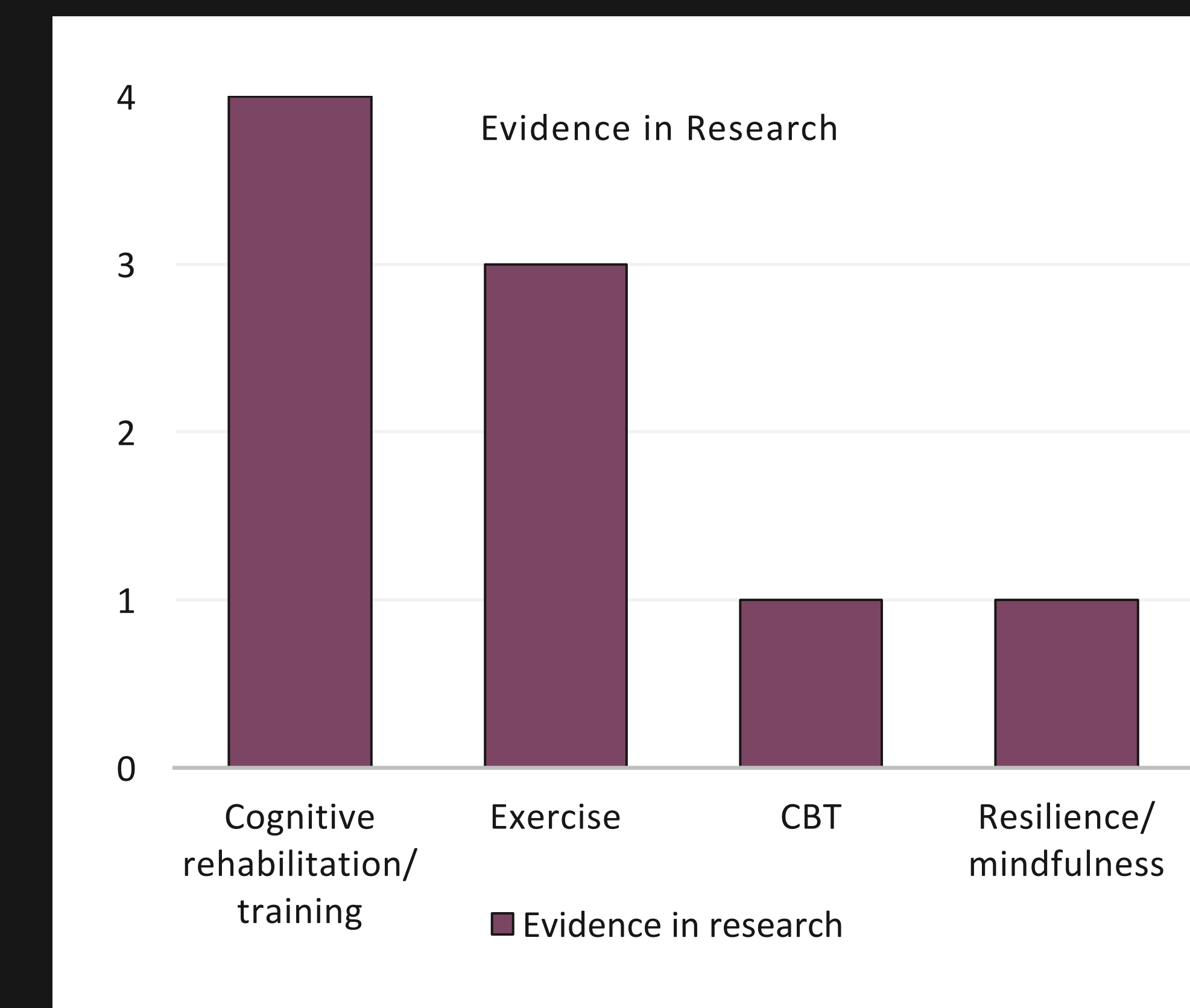
Exclusion criteria:

1. Only participants with primary CNS neoplasm or metastasis to brain
2. All participants received CNS radiation treatment

312 studies on initial database search → 9 studies met criteria

Intervention Type	Author, Year	Study Design	Sample Size	Age range
CBT	Sansom-Daly, 2021	RCT	40	AYA
Cognitive rehabilitation/training	Conklin, 2015	RCT	68	Adolescents
	Gooch, 2022	RCT (pilot study)	14	AYA
	Hardy, 2012	RCT	20	Adolescents
	Moore, 2011	RCT	57	Children and Adolescents
Exercise	Benzing, 2020	RCT	69	Children and Adolescents
	Howell, 2018	RCT	97	Adolescents
Resilience/mindfulness	Wurz, 2021	RCT (proof of concept)	5	AYA
	Van der Gucht, 2020	RCT	33	Young adults

Results



Type of Study	Components	Successful?*
Cognitive rehabilitation/training	25 computer-based training sessions with weekly telephone based coaching or 40-50 hours individualized mathematics over 1 year or 20-30 minute computer-based training sessions per day for 16 weeks	Yes
Exercise	Physical activity via game console with three 45 min sessions per week for 8 weeks or Physical activity via interactive website with rewards over 24 weeks or Four 25-45 min exercise sessions per week for 12 weeks	Variable
CBT	Six 90 minute online group sessions led by psychologist with peer discussion over 6 weeks	No
Resilience/mindfulness	Four 3 hour in-person group sessions with online support over 8 weeks	Variable

*Successful: Statistically significant ($p \leq 0.05$) improvement in a neurocognitive outcome/symptom of CRCI

Limitations

- Variability of language used to describe CRCI
- Inconsistencies in the definition of CRCI
- Different objective and subjective measures of CRCI used in each study
- Small number of studies limits ability to confidently analyze effectiveness of intervention type

Conclusions

At this time, cognitive rehabilitation/ training has the strongest supporting evidence in reducing CRCI in AYA cancer survivors. Physical activity interventions may also be effective in some cases. In general, digital delivery showed promise in being a more effective and viable option for AYAs. Because it affects a quarter of AYA cancer survivors, further investigation into means of addressing CRCI is essential.

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