

# Effect of exercise on chemotherapy-induced diarrhea in 198 older cancer patients:

## A URCC NCORP nationwide randomized controlled trial

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### Background

- Chemotherapy-induced diarrhea (CID) is a common toxicity.
- CID may partially be mediated by inflammatory cytokines.
- Older age is a risk factor for development of CID.
- Little is known if exercise improves CID in older patients with cancer.
- We conducted a secondary analysis of a nationwide phase III randomized controlled trial to assess the effect of exercise on CID in this population.

### Methods

- Study population = 198 older patients with cancer (aged ≥60 years)
- Randomized to receive chemotherapy alone (control) in 2 to 3-week cycles or with a 6-week home based exercise program (Exercise for Cancer Patients; EXCAP)
- Statistical analysis:
  - 1) ANCOVA to evaluate the effect of EXCAP on CID (measured by the Symptom Inventory), adjusting for baseline values, gender and chemotherapy duration
  - 2) Pearson correlations to evaluate associations between changes in CID and inflammatory cytokines (IL-6, IL-8, IL-10, IL-1β, IFN-γ, & TNFr1).

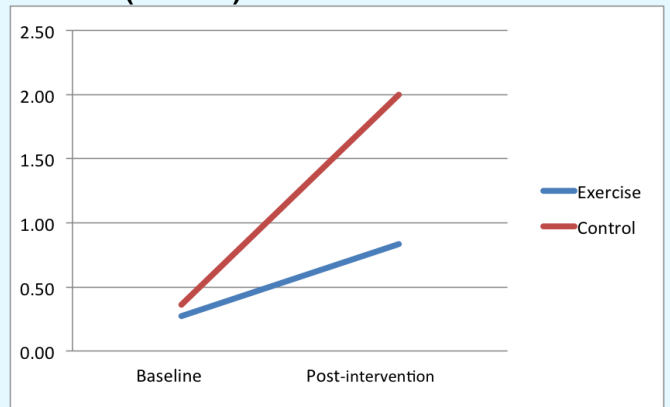
### Results

**Table 1: Baseline demographics of the study population**

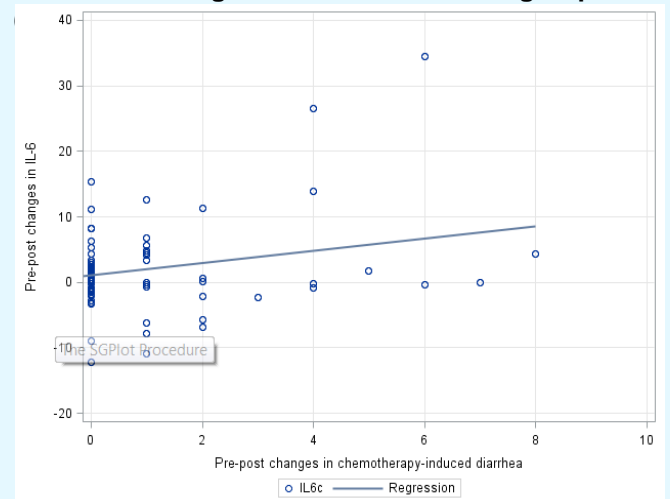
Characteristics		Exercise (n=114)	Control (n=84)	
Age, years, mean (SD)*		67.7 (5.7)	65.3 (4.0)	
Gender, %	Female	91.2	92.9	
Chemotherapy cycle, %	Every 2-week	26.3	31.0	
	Every 3-week	73.7	69.0	
Race, %	White	89.5	89.3	
	Marital status, %	Yes	65.8	57.1
	Cancer site, %	Breast	78.1	76.2
Colon		6.1	7.1	
Lung		4.4	6.0	
Karnofsky performance status, %	Other	11.4	10.7	
	70-80	15.8	20.2	
	90	35.1	35.7	
	100	49.1	44.0	

\*All baseline characteristics were not significantly different except for age (P<0.01)

**Figure 2: Baseline and post-intervention chemotherapy induced-diarrhea in the control and exercise groups, higher score indicates worse diarrhea (P=0.008)**



**Figure 3: Correlation between changes in social well-being and IL-6 in the control group**



### Results (Cont'd)

- Both groups developed worsening CID (Figure 2).
- The EXCAP group reported less severe CID compared to the control group (mean change: 0.57 vs. 1.64; P=0.008).
- In the control group, worsening CID was associated with elevated pro-inflammatory cytokine, IL-6 (r=0.39, p=0.03) but not in the EXCAP group (Figure 3).
- No associations were seen in other cytokines.

### Conclusion

- Exercise improves self-reported CID severity in older patients with cancer.
- The up-regulation of inflammatory cytokine in CID may be mitigated by exercise.
- To our knowledge, this is the first study demonstrating the positive effect of exercise on CID older cancer patients.

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