Biggest Loser? Caloric Restriction and Later Incidence of Frailty

Philip M. Kayser, MS-2; Kathryn Callahan, MD; Nicholas Pajewski, PhD; Denise Houston, PhD; Barbara Nicklas, PhD
Wake Forest School of Medicine Claude D. Pepper Older Americans Independence Center

BACKGROUND

- The overall safety and long-term benefits of intentional weight loss in older adults remains controversial
- Diet-induced weight loss in older adults improves physical and metabolic function in the short-term
- It is unknown whether these benefits persist over time

PURPOSE

- This study determined whether weight loss from a caloric restriction (CR) intervention earlier in life is advantageous or deleterious to the risk of developing frailty (using a calculated EMR-Based Frailty Index, eFI) 8.00 ± 2.28 years in the future

STUDY SAMPLE

- 968 older adults were identified who participated in one of five randomized, controlled weight loss trials from 2005 to 2014
- Of the 968, n=351 had sufficient data to calculate an eFI for analysis

	Total Sample (n=968)	eFI Group (n=351)
Mean Age at Baseline	68.9 ± 4.92	68.3 ± 4.90
Percent Deceased	11.8	7.95
Percent Caloric Restriction	54.7	57.1
Mean Baseline BMI	33.6 ± 4.51	33.9 ± 4.65
Percent Male	31.3	27.0
Percent White	77.2	78.4

METHODS AND DATA ANALYSIS

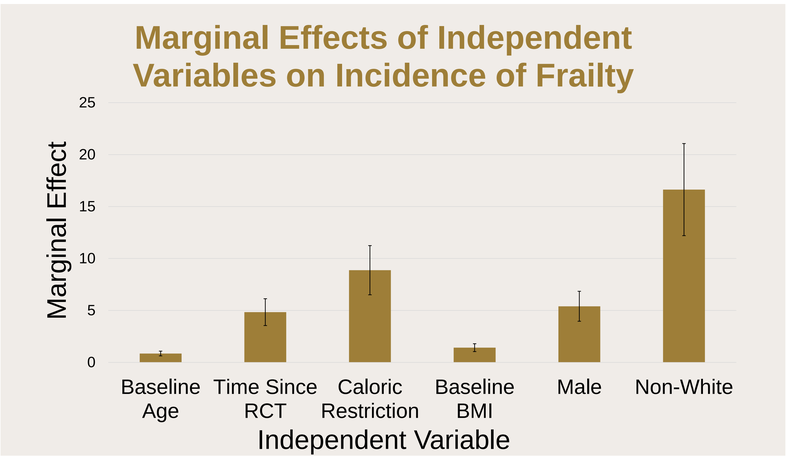
- The EPIC-based Frailty Index (eFI) is a deficit-accumulation model from a 2-year lookback period, incorporating 56 discrete elements into an eFI score: Fit (eFI ≤ 0.10), Pre-frail (0.10 < eFI ≤ 0.21), or Frail (eFI > 0.21)
- A logistic regression model was constructed to estimate the effect of caloric restriction on later incidence of frailty (eFI score > 0.21)

Independent Variable	Marginal Effect	p-value
Age at Baseline (1 year)	0.00855 ± 0.0228	0.0739
Time Since RCT (1 year)	0.0484 ± 0.0129	<0.0001
Caloric Restriction	**0.0888 ± 0.0237**	**0.0662**
Baseline BMI (1 point)	0.0142 ± 0.00378	0.0056
Male	0.0540 ± 0.0144	0.3119
White	-0.166 ± 0.0444	0.0033

	No CR (n=150)	CR (n=201)
Mean Age at Baseline	68.2 ± 5.00	68.3 ± 4.84
Time Since Last RCT	8.02 ± 2.41	7.97 ± 2.18
Mean Baseline BMI	33.9 ± 4.92	33.9 ± 4.55
Percent Weight Lost	1.43 ± 4.41	7.83 ± 6.70
Percent Male	27.1	26.9
Percent White	80.8	76.6
Percent Deceased	7.28	8.46
Mean eFI Score	0.168 ± .0741	0.184 ± .0814
Percent Frail (eFI>0.21)	25.8	35.3

RESULTS

- Individuals who underwent caloric restriction are 8.89% more likely to be frail, as compared to individuals who did not undergo caloric restriction (p=0.07)
- The logit model correctly predicts 70.4% of the values, and the rest are misclassified



CONCLUSION

- Caloric Restriction in older adults may lead to a higher incidence of frailty later in life
- This does not necessarily indicate a more rapid decline in functional status
- Whether this is the result of a disproportionate weight regain (or rebound) of adipose tissue that predisposes to frailty remains to be studied

REFERENCES

1. Houston, D. *Long-term function and health effects of intentional weight loss in obese elders.* NIH Grant Number R01 AG056418.

2. Pajewski, N., Lenoir, K., Wells, B., Williamson, J., Callahan, K. (2018) *Frailty Screening Using the Electronic Health Record within a Medicare Accountable Care Organization.* Manuscript submitted for publication.