



2018 NEWSLETTER

Since the completion of the second in-person visit last year, we have been following up with each of you by telephone or mail to update changes in your health and activities. We sincerely appreciate your time in completing these questionnaires as these data are vital to our long-term study. We also really enjoy catching up with you!

We are fortunate to be able to study many healthy and long-lived families and would like to take the opportunity to feature a milestone celebration of one of our fantastic families.

Long Life Family Study Participant Celebrates Centennial Birthday

Leo G. McManus, enrolled at the University of Pittsburgh Field Center since 2008 celebrated his 100th birthday last February. "I'm very pleased to take part in such important work," he commented. "My family is blessed with long and healthy life." Leo's second wife Lillian also was in LLFS until her death in 2014 at the age of 96.

Leo married his first wife, Rosemary, in 1941, and they had five children. Several of the next generation and their spouses are also participants in the Long Life Family Study. "I hope I live a very long time as well, just so I can see what the study reveals," observed his daughter Kathleen.

Leo remains mobile, oriented, alert, and vigorous. "I'm lucky not to have any health problems as so many of my friends do," says Leo.

The logo on the T-shirts says "Leo G McManus Centennial Celebration" around the circle. Leo's motto "KGDS" appears in the center: "Keep Going! Don't Stop!" He and his family believe that his positive attitude has contributed to his continuing to thrive. Leo also credits the environment and the caring staff at Friendship Village where he lives.



Top row: Colleen Moreta and Amy Koss, family friends; daughter Kathleen; family friend Carolyn Seymour; daughter Maureen; daughter Rosemary; son Terrence. Bottom row: Son Kevin; Leo; son-in-law Frank Puziene.

Leo was the second of four boys in his birth family. The oldest died two years ago at 99. The other two are 98 and 93, and are in good physical and cognitive health, still living independently. Leo moved just this year into the nursing wing from an independent living apartment as he has lost most of his sight due to macular degeneration.



Leo with grandson Patrick Puziene, daughter Maureen McManus, and son-in-law Frank Puziene, Thanksgiving 2018

If you have a family member you would like to feature let us know! Also, please continue to keep us posted on how you and your family members are doing, including all address or phone number changes. **Contact our research assistants or Dr. Stacy Andersen, Project Manager, Boston Medical Center Field Center, 617.638.6670, toll-free 1-888-333-6327 or stacy@bu.edu.**

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LLFS Research Update 2018

In 2018, 22 presentations were given by LLFS Investigators at major international scientific conferences including: Gerontological Society of America, American Society of Human Genetics, American College of Medical Genetics, American Heart Association, American Diabetes Association, and the Alzheimer's Association. Some highlights of our work:

Heritability and Prevalence of Perceived Physical Fatigability in the Long Life Family Study

LaSorda and Glynn et al. Gerontological Society of America, November 2018, Boston, MA

Fatigability is an important early predictor in the disablement pathway, yet little is known about its genetic basis or association with age and sex. We examined prevalence and heritability of perceived physical fatigability using the Pittsburgh Fatigability Scale (PFS, 0-50, higher score=higher fatigability) in the Long Life Family Study. PFS scores (mean±SD) and proportion with higher fatigability (% PFS ≥15) increased across age strata: 60-69 (N=1009, 11.0±7.6, 28%), 70-79 (N=847, 12.5±8.1, 37%), 80-89 (N=253, 19.3±9.9, 65.2%), and ≥90 (N=266, 28.6±9.8, 89.5%), $p<0.0001$, adjusted for sex, field center, and family structure. Females reported higher perceived physical fatigability than males, with the largest difference in the 80-89 age strata, 74.8% vs. 53.5%, respectively, $p<0.0001$. After adjustment for age, sex, and field center, the residual heritability of fatigability was 26.3% ($p=6.6\times 10^{-9}$). Future research should target interventions aimed at those most at-risk for higher perceived physical fatigability early in the aging process.

Correlation between Vascular Aging and Functional Decline in Exceptionally Long-Lived Families

Kuipers et al. American Heart Association Scientific Sessions 2018, November 2018, Chicago, IL

Atherosclerosis occurs with age and has been associated with increased risk of cognitive decline, dementia, and declines in physical function. We estimated both the phenotypic and genetic correlation between vascular disease, and cognitive and physical functioning in 2060 participants in LLFS. Participants underwent carotid artery ultrasound as well as multiple tests of cognitive and physical functioning. Greater carotid IMT and diameter were correlated with lower grip strength, and greater carotid diameter was correlated with poorer chair stand test performance. While there was no phenotypic correlation between vascular measures and cognitive function, there was significant genetic correlation between working memory and carotid IMT. This analysis provides further evidence for an association between vascular aging and functional decline, and highlights the possibility of a shared genetic link between atherosclerosis and cognitive decline in exceptionally long-lived families.

Prevalent and Incident Physical and Cognitive Independence among the Oldest Old

Santanasto et al. Gerontological Society of America, November 2018, Boston, MA

Concern exists that many older adults will become dependent, resulting in huge societal burden. We examined 7-year change in physical (no difficulty performing ADL activities), cognitive (Mini Mental State Examination score ≥23) and overall independence (physically and cognitively independent) in adults aged 90.3±6.3 years. At baseline (n=1442), 83.8%, 85.0% and 70.9% were physically, cognitively and overall independent, respectively. After 7-years, 951 (66%) died and 108 (7.5%) were lost to follow-up. Importantly, 91.8% lost to follow-up had overall independence at baseline, in contrast with only 59.9% of those who died. At follow-up, the prevalence of physical, cognitive and overall independence was 74.1%, 82.1% and 60.7%, respectively. Of those physically, cognitively and overall independent at baseline, 22.3%, 13.8%, and 30.9% developed incident dependence. In conclusion, individual risk of incident overall dependence was high (30.9%), but prevalence increased by only 10.2%, mainly attributable to high mortality among those dependent at baseline.

Digital Cognitive Data in the Long Life Family Study

Andersen and Sweigart et al. Gerontological Society of America, November 2018, Boston, MA

At the second in-person visit of the Long Life Family Study we implemented the use of a digital pen, a ballpoint pen with a digital camera that records the movement of the pen across the paper, for all written cognitive tests. In addition, the Boston field center recorded spoken responses using a digital voice recorder. Our goal is to use the digital data to identify features of written and spoken test responses that may be early markers of cognitive change. To date we have analyzed digital pen data from one cognitive test and found that the digital measures correlated well with traditional test scores but did not correlate well with non-cognitive measures, such as age and walking speed. This supports the notion that digital metrics are measuring cognition rather than other aspects of aging. Secondly, we were able to cluster people together who showed similar types of change in performance over the test such as those who were fast at completing the test from start to finish and those who started slow but got faster during the test. These performance patterns would not be able to be detected by an examiner and can only be captured through the use of the digital pen. Future work will investigate how these patterns relate to changes in cognition over time.