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Six weeks of omega 3-fatty acids, curcumin, and citicoline supplementation on cognitive function

Submission date
02/06/2026

Recruitment status
Recruiting

Registration date
04/06/2026

Overall study status
Ongoing

Last Edited
04/06/2026

Condition category
Nervous System Diseases

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Improving energy levels, reducing oxidative stress and inflammation, and increasing the availability of the essential nutrient choline that serves as a precursor to the neurotransmitter acetylcholine in the brain have been recommended as nutritional strategies to improve cognitive function and delay cognitive decline during aging. The research team recently showed that dietary supplementation of creatine monohydrate (CrM) (10 g/d) and its precursor guanidinoacetic acid (GAA) (2 g/d) for 6 weeks improved brain energy availability and cognitive function in adults. Moreover, creatine (Cr) supplementation (10 g/d for 12 weeks) improved markers of cognition in older adults as well as promoted more favorable changes in body composition during a diet and exercise program. The next step in the WoodNext Research Initiative on Cognition, Health and Aging research is to determine whether adding an antioxidant (omega-3-fatty acids of fish oil), anti-inflammatory (curcumin), and citicoline can promote additional benefits to Cr and GAA supplementation on cognitive function. In this regard, omega-3 fatty acids (fish oil) supplementation has been shown to improve cognitive function, memory, and mood as well as promote neuroprotection. Curcumin has anti-inflammatory properties that have been reported to promote brain health and maintain cognitive function during aging. Moreover, citicoline or cytidine 5'diphosphocholine (CDP-choline) is a naturally occurring nucleotide in the body that is essential for the synthesis of phosphatidyl choline in the brain, which is a primary neurotransmitter. Studies have shown that citicoline supplementation can improve memory, reaction time, and psychomotor function, particularly in older populations. The purpose of this study is to determine whether omega-3 FA + curcumin + citicoline supplementation improves cognitive function in adults and whether co-ingesting these nutrients with Cr and GAA will promote additive and/or synergistic effects. To do so, we will first assess the effects of six weeks of supplementation of a placebo, omega 3 FA + curcumin + citicoline, or the combination of omega 3 FA + curcumin + citicoline with Cr + GAA on cognitive function in healthy adults as outlined in this protocol. If results are promising, the research team will then conduct a follow-up on the effects of these nutritional strategies during a 12-week exercise and diet intervention (separate protocol).

Who can participate?
Healthy volunteer adults aged 18 to 65 years.

What does the study involve?
Potential study participants will undergo a phone screening using the study phone script to determine general eligibility. If they pass, they will be invited to a familiarization session. During the familiarization, which will take approximately one hour, participants will be informed about the study, sign informed consent statements in compliance with the University IRB, and complete a health history form included with the general screening form. Participants will respond to health history questionnaires and undergo a general health assessment, including having height and weight measured on a calibrated scale, resting blood pressure (RBP) determined using a blood pressure cuff and resting heart rate (RHR) measured. They will next be informed of the general methods of the study and allowed to practice the COMPASS cognitive function tests. This consists of seven (7) components, including 1. immediate and delayed word recall, 2. delayed word recognition, 3. delayed picture recognition, 4. Corsi blocks task, 5. digit vigilance, 6. Stroop test and 7. choice reaction time.

They will also be given instructions on how to complete the 4-day food log. Participants will be asked to record food and fluid intake for 4 days prior to testing, fast for 12 hours, avoid intense exercise for 24 hours, and refrain from consuming atypical amounts of caffeine and other stimulants not normally consumed in their diet for 48 hours prior to testing. Those eligible to participate will be scheduled for baseline assessments.

The baseline testing session will take approximately one to two hours. Participants will first report to the Exercise & Sport Nutrition Lab (ESNL) and return their 4-day food log. Next, participants will be asked to complete a series of questionnaires, including questions about cognition, memory, quality of life, physical activity, mood, sleep, stress, and menstruation (females). Next, they will be asked to complete the COMPASS Cognitive Function Test Battery.

Then, they will be weighed and have waist and hip (W/H) measures taken using a tape measure. Then, participants will be asked to lie motionless on a DXA body composition scanner for approximately three minutes while it scans their body. Following the DXA, the team will measure their resting heart rate (RHR) and resting blood pressure (RBP). Finally, the team will ask them to donate a fasting blood sample of approximately 20 milliliters (~ 4 teaspoons).

The follow-up testing session will take approximately one to two hours. All testing is repeated six weeks after baseline. They will also be asked to complete a Supplement Log throughout the study and a Treatment Group Guess Form at the completion of the study.

Treatment Groups: Participants will be randomized into one of the following three (3) treatment groups:
Treatment 1: Placebo (Maltodextrin; 2 x 6 g/day maltodextrin)
Treatment 2: Omega 3-Fatty Acids* (2 x 1 g/day), Curcumin (2 x 500 mg/day), Citicoline (2 x 500 mg/day) + 2 x 6 g/day maltodextrin
Treatment 3: Omega 3-Fatty Acids* (2 x 1 g/day), Curcumin (2 x 500 mg/day), Citicoline (2 x 500 mg/day) + Creatine [CrM] (2 x 5 g/day), Guanidinoacetic Acid [GAA] (2 x 1 g/day).

All supplements will be prepared in generic packets for a double-blind study. Participants will be asked to consume the supplement dose with breakfast at approximately 8:00 a.m. every day and dinner at approximately 6:00 p.m. every day for six weeks. The group they will be assigned to will be chosen by chance, like flipping a coin. Neither the participant nor the study staff know what treatment they will receive. They will have an equal chance of being in each group.

*Omega 3-Fatty Acids (3:1 DHA:EPA Ratio)

What are the possible benefits and risks of participating?
There is no direct benefit to the individual participant.

Participants who meet eligibility criteria will be exposed to a low level of radiation (2.5 mRem) during the body composition test two times over six weeks. This dose is about equal to the level of radiation associated with an airplane flight from Houston to Dallas, or the atmospheric background radiation during two days in College Station. Studies have shown that getting a lot of radiation at one time or getting many small doses over time may cause cancer. There is no known minimum level of radiation exposure that is recognized as being free of all risk. However, the probability of harm associated with the amount of radiation exposure that you will receive in this study is considered very low when compared with the everyday risks each person receives in a year.

Participants will donate approximately four (4) teaspoons (about 20 milliliters of venous blood) two (2) times during the duration of the study. Phlebotomy needle sticks may cause a small amount of pain when the needle is inserted into the vein, as well as some bleeding and bruising in the arms. The participant may also experience some dizziness, nausea, and/or fainting if they are unaccustomed to having blood drawn. Risks that are possible but unlikely include infection, nerve damage, and puncturing an artery instead of a vein. However, only a trained and certified phlebotomist will be performing blood sampling using previously approved sterile procedures. In addition, a blood draw attempt will not occur more than two times per visit if they are unable to obtain a blood sample. To minimize these risks, no indwelling catheter will be used, and all laboratory study personnel are trained, certified and have experience in phlebotomy. All study personnel performing blood draws have conducted at least 30 sticks prior to drawing blood for this study. Furthermore, they will attempt to use both arms, forearms, and wrists if needed to spread out the blood draws from one visit to the next. In addition, all laboratory study personnel have completed bloodborne pathogen training, BL2 training, and CPR/AED/First Aid training required by Texas A&M University.

Possible side effects of CrM supplementation include a small amount of weight and muscle mass gain. Possible side effects of GAA supplementation include a small increase in homocysteine. Possible side effects of Omega 3-Fatty Acid, Curcumin, and Citicoline supplementation include nausea, headaches, and bad breath. Other possible side effects of GAA, CrM, Omega 3-Fatty Acid, Curcumin, Citicoline, and the placebo (CoP) may include bloating, cramping, gas, and diarrhea. Although allergic reactions to all the treatments are rare, symptoms may include itching or swelling in your face, lips or mouth, skin rashes, hives, asthma, sinus pressure, nasal congestion, shortness of breath, wheezing, sinus headaches, diarrhea, vomiting, nausea, and abdominal pain.

Where is the study run from?
WoodNext Foundation, USA.

When is the study starting and how long is it expected to run for?
June 2026 to August 2027.

Who is funding the study?
WoodNext Foundation, USA.

Who is the main contact?
Dr Richard Kreider, rbkreider@tamu.edu

Contact information

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Additional identifiers

Study information

Scientific Title
Effects of six weeks of omega 3-fatty acids, curcumin, and citicoline supplementation on cognitive function

Acronym
WoodNext Study #4

Study objectives

The aim of this study is to evaluate the effects of six weeks of Omega 3-Fatty Acids (FA), Curcumin, and Citicoline supplementation with and without Creatine (Cr) and Guanidinoacetic Acid (GAA) on cognitive function.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 01/04/2026, Texas A&M University Institutional Review Board (IRB) (301 Old Main Drive Suite 3104, College Station, 77845, United States of America; +1 9798458585; irb@tamu.edu), ref: STUDY2025-1226

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Placebo

Assignment
Parallel

Purpose
Treatment

Study type(s)

Health condition(s) or problem(s) studied
Cognitive function

Interventions
Screening: Potential study participants will undergo a phone screening using the study phone script to determine general eligibility. If they pass this initial screening, they will be invited to a familiarization session. If they do not pass, their data will be stored and safeguarded in the same manner as the data for those who do pass.

Familiarization: During the familiarization, which will take approximately one hour, participants will be informed about the study, sign informed consent statements in compliance with University IRB, and complete a health history form included with the general screening form. Participants will respond to health history questionnaires and undergo a general health assessment including having height and weight measured on a calibrated scale, resting blood pressure (RBP) determined using a blood pressure cuff, and resting heart rate (RHR) measured. These measurements will be recorded on the General Screening Form and Case Report Form (Familiarization). Participants will next be informed of the general methods of the study and allowed to practice the COMPASS cognitive function tests. They will also be given instructions

on how to complete the 4-day food log. Participants will be asked to record food and fluid intake for 4 days prior to testing, fast for 12 hours, avoid intense exercise for 24 hours, and refrain from consuming atypical amounts of caffeine and other stimulants not normally consumed in their diet for 48 hours prior to testing. Those eligible to participate will be scheduled for baseline assessments.

Testing: The baseline testing session will take approximately one to two hours. Participants will first report to the Exercise & Sport Nutrition Lab (ESNL) and return their 4-day food log. Next, participants will be asked to complete a series of questionnaires including 1.) The Mini-Mental State Examination (MMSE). The MMSE is effective as a screening tool for cognitive impairment in older, community-dwelling, hospitalized, and institutionalized adults. If they score less than 23, they will be omitted from further study participation. To continue with the study, they will need to achieve a score of 23 or above (to indicate they are more than likely free from declining cognitive issues). The form is not used to diagnose or treat, but simply to correlate results (including those in the normal range of 25 to 30). Participants must be competent enough to participate such that a legal representative or guardian does not need to explain and approve participation. As with any unusual results, if values are out of range (< 23), participants will be informed and given the option to have the results forwarded to their physician. However, this is not a study to identify, diagnose, or treat Mild Cognitive Impairment (MCI). The aim is to determine whether the MMSE score correlates to markers of cognitive function and whether this may affect that correlation. If participants score 23 or higher, they will continue with 2.) The Memory Complaint Questionnaire (MAC-Q). This is a self-reporting questionnaire for elderly individuals which includes memory problems in general and daily living. To continue with the study, a score of 25 or higher must be achieved (greater scores indicate subjective memory loss). If they score less than 25, they will be omitted from further study participation. If they score 25 or higher, they will continue with 3.) The SF-36 Quality of Life (QOL) Questionnaire. This is a set of generic, coherent, and easily administered quality-of-life measures. 4.) The International Physical Activity Questionnaire (IPAQ) – Long Form. This is a standardized measure to estimate the habitual practice of physical activities of populations from different countries and socio-cultural contexts. 5.) The Profile of Mood States (POMS). This is a widely used questionnaire in the clinical field when examining psychotherapeutic, psychological, and somatic questions. 6.) The Wechsler Memory Scale (WMS - VAP1 and VAP2). This provides information on a range of memory components, namely, auditory memory, immediate memory, delayed memory, visual memory, and visual working memory. 7.) The Leeds Sleep Evaluation Questionnaire. This questionnaire comprises ten self-rating 100-mm-line analog questions concerned with sleep and early morning behavior. 8.) The Cohen’s Perceived Stress Scale (PSS). This is the most widely used psychological instrument for measuring the perception of stress. It measures the degree to which situations in one’s life are appraised as stressful. 9.) A Menstrual Status Questionnaire (females only). This is a questionnaire about menstrual experiences and general health. 10.) A Menopause Status Questionnaire (females only). This is a questionnaire about menopause experiences and general health. 11.) A Side-Effects Questionnaire. This questionnaire asks participants to rate the frequency and severity of common side effects. The menstrual and menopause status questionnaires are intended to assess whether the supplements have any effect on female health. Next, participants will complete the COMPASS Cognitive Function Test Battery. This consists of seven (7) components including 1.) Immediate and Delayed Word Recall, 2.) Delayed Word Recognition, 3.) Delayed Picture Recognition, 4.) Corsi Blocks Task, 5.) Digit Vigilance, 6.) Stroop Test, and 7.) Choice Reaction Time. Next, participants will be weighed and have waist and hip (W/H) measures taken using a Gulick tension regulated tape measure. Participants will then be asked to lie motionless on a DXA body composition scanner for approximately three minutes while their body is scanned. Following the DXA, resting heart rate (RHR) and resting blood pressure (RBP) will be measured. Finally, participants will be asked to donate a fasting blood sample of approximately 20 milliliters (~ 4 teaspoons). Blood draws are

requested to help answer scientific questions (i.e., dependent variables like complete blood count (CBC-23), comprehensive metabolic panel (Chem-18), lipid panel (Lipid-4), and homocysteine (Hcy)) and to assess safety of the supplements. All lab samples will be sent to Clinical Pathology Laboratories for processing (CPL, Austin, Texas, CLIA Certificate #45D0505003). Venous blood will be taken from the most common site for performing venipuncture, the antecubital area of the arm. Once a suitable vein in the forearm is identified and a disposable rubber tourniquet is applied, the phlebotomist will clean the insertion site with an alcohol prep pad saturated with 70% isopropyl alcohol. Either a straight needle connected to a vacutainer tube holder or a winged blood collection set, also known as a "butterfly" set, will be inserted into the vein. Approximately 20 milliliters (~ 4 teaspoons) of venous blood will be collected into two (2) SST Tiger Top vacutainer tubes and one (1) EDTA Purple Top vacutainer tube. After the blood is collected, the needle and set will be removed and immediately placed into a biohazard sharps container. Finally, a Band-Aid will be placed over the insertion site. A blood draw attempt will not occur more than two times per visit if a blood sample cannot be obtained.

Follow-Up: The follow-up testing session will take approximately one to two hours. All testing will be repeated six weeks after baseline. Participants will also be asked to complete a Supplement Log throughout the study and a Treatment Group Guess Form at the completion of the study.

Treatment Groups: Participants will be randomized into one of the following three (3) treatment groups;

Treatment 1. Placebo (Maltodextrin; 2 x 6 g/day maltodextrin)

Treatment 2. Omega 3-Fatty Acids* (2 x 1 g/day), Curcumin (2 x 500 mg/day), Citicoline (2 x 500 mg/day) + 2 x 6 g/day maltodextrin

Treatment 3. Omega 3-Fatty Acids* (2 x 1 g/day), Curcumin (2 x 500 mg/day), Citicoline (2 x 500 mg/day) + Creatine [CrM] (2 x 5 g/day), Guanidinoacetic Acid [GAA] (2 x 1 g/day)

*Omega 3-Fatty Acids (3:1 DHA:EPA Ratio)

Intervention Type
Supplement

Primary outcome(s)
1. Body weight in kg measured using a calibrated digital scale at 0 weeks (baseline) and 6 weeks (follow-up)

2. Waist-to-Hip Circumference measured using a tension regulated tape measure at 0 weeks (baseline) and 6 weeks (follow-up)

3. Cognitive Function measured using the COMPASS cognitive function test battery at 0 weeks (baseline) and 6 weeks (follow-up)

4. Body composition measured using a calibrated dual-energy X-ray absorptiometry (DXA) at 0 weeks (baseline) and 6 weeks (follow-up)

Key secondary outcome(s)

1. Lipid Panel measured using a calibrated and automated analyzer at Clinical Pathology Laboratory (CPL) at 0 weeks (baseline) and 6 weeks (follow-up)

2. Comprehensive metabolic panel (Chem Panel) measured using a calibrated and automated analyzer at Clinical Pathology Laboratory (CPL) at 0 weeks (baseline) and 6 weeks (follow-up)

3. Complete Blood Count (CBC) with automated differential measured using a calibrated and automated analyzer at Clinical Pathology Laboratory (CPL) at 0 weeks (baseline) and 6 weeks (follow-up)

4. Side-effects measured using a side-effects questionnaire at 0 weeks (baseline) and 6 weeks (follow-up)

5. Blood pressure measured using a sphygmomanometer at 0 weeks (baseline) and 6 weeks (follow-up)

6. Heart rate measured using a sphygmomanometer at 0 weeks (baseline) and 6 weeks (follow-up)

Completion date
31/08/2027

Eligibility

Key inclusion criteria
1. Must have the ability to complete the study, comply with the study procedures, consume the investigational product daily for the duration of the study, and provide voluntary written informed consent in English (i.e., English literacy) to participate in the study
2. Must have the ability to refrain from alcohol intake and ingesting caffeinated foods and beverages (chocolate, coffee, tea, energy drinks, etc.) 48-hours prior to each testing session
3. Must agree to abstain from dietary supplements (e.g., caffeine, gingko biloba, ashwagandha, paraxanthine, arginine, etc.) that may affect cognitive function during the study
4. Must have the ability to complete and understand the cognitive function practice tests in English (i.e., English literacy)

Healthy volunteers allowed
Yes

Age group
Mixed

Lower age limit
18 Years

Upper age limit
65 Years

Sex
All

Total final enrolment

0

Key exclusion criteria
1. Known vitamin B12/B6 or folate deficiency
2. Known homocystinuria (a rare inherited metabolic disorder that prevents the body from processing the amino acid methionine)
3. High homocysteine levels (> 50 µmol/L)
4. A history of kidney disease requiring dialysis
5. Diagnosed with a cognitive impairment or neurological disease (e.g., Alzheimer's disease, Parkinson's disease, etc.)
6. Pregnant (confirmed via a negative pregnancy test for all female participants), breastfeeding, or wishing to become pregnant during the study
7. Uncontrolled heart disease, hypertension, diabetes, thyroid disease, cancer, neurological disease or medically treated major psychological or depressive disorder that may affect results of the study
8. A known allergy or are you sensitive to meat or fish (containing GAA and Cr) or any of the ingredients in the supplement products (GAA, Cr, Omega-3 fatty acids, curcumin, citicoline, and maltodextrin placebo)
9. Additional conditions which, in the PI's opinion, may adversely affect your ability to complete the study, its measurements, or pose a significant risk

Date of first enrolment
01/06/2026

Date of final enrolment
01/06/2027

Locations

Countries of recruitment
United States of America

Sponsor information

Organisation
WoodNext Foundation

Funder(s)

Funder type

Funder Name
WoodNext Foundation

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available