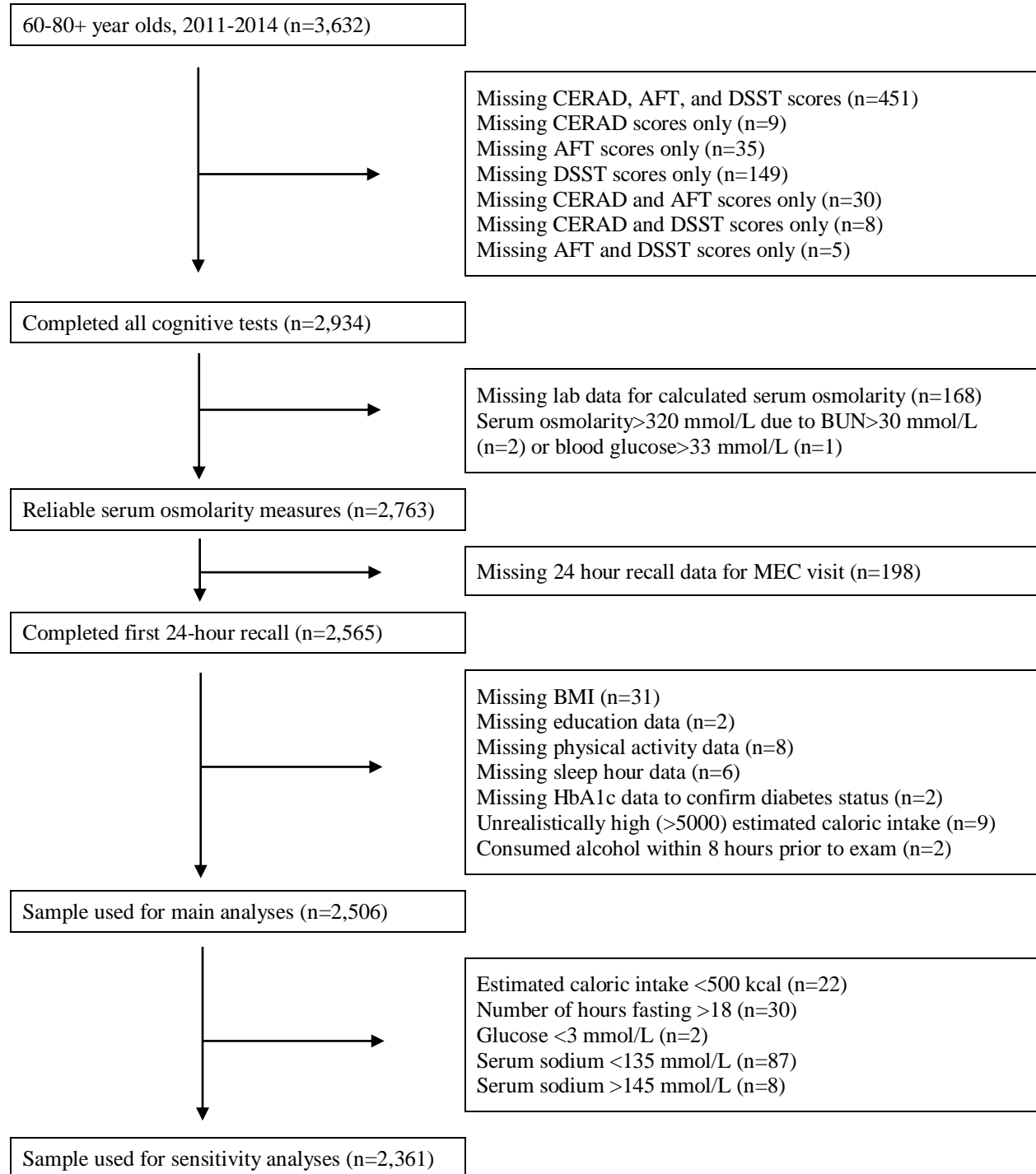


SUPPLEMENTAL MATERIALS – Cognitive performance in relation to hydration status and water intake among older adults, NHANES 2011-2014

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Supplemental Figure 1. Participant flow chart



Supplemental Table 1. Demographic, lifestyle, and health characteristics across categories of serum osmolarity, US adults ≥ 60 years old, NHANES 2011-2014.

	Sosm: <285 mmol/L (n=125)		Sosm: 285-289 mmol/L (n=377)		Sosm: 290-294 mmol/L (n=896)		Sosm: 295-300 mmol/L (n=793)		Sosm: >300 mmol/L (n=315)	
	Weighted Means	SE	Weighted Means	SE	Weighted Means	SE	Weighted Means	SE	Weighted Means	SE
Age (years):										
60-64	37.0%	6.2%	35.4%	2.7%	37.0%	2.3%	29.7%	2.6%	19.8%	3.0%
65-69	20.5%	4.7%	29.9%	4.1%	25.4%	2.1%	23.7%	2.1%	17.8%	2.6%
70-74	15.4%	3.9%	16.9%	2.8%	17.9%	1.5%	18.3%	1.9%	25.2%	3.0%
75-79	11.4%	4.0%	9.7%	1.7%	9.6%	1.2%	12.2%	1.4%	11.5%	2.0%
≥ 80	15.7%	3.0%	8.2%	1.9%	10.2%	0.9%	16.0%	1.4%	25.7%	2.7%
Female (%)	61.0%	6.8%	57.1%	4.0%	55.1%	2.3%	50.7%	2.4%	48.2%	3.1%
Education level:										
<High school education	86.9%	2.6%	79.3%	2.7%	78.2%	2.3%	78.6%	2.2%	82.7%	2.7%
High school graduate	3.8%	1.1%	8.4%	1.4%	8.7%	1.5%	8.2%	1.4%	7.4%	1.4%
Some college	4.2%	1.3%	6.9%	1.2%	7.7%	1.3%	7.5%	1.5%	7.1%	1.8%
College graduate+	5.0%	1.6%	5.5%	1.4%	5.4%	1.0%	5.7%	0.8%	2.8%	0.8%
BMI (kg/m ²)	27.5	1.3	27.9	0.5	29.5	0.3	29.1	0.3	29.8	0.6
Moderate and vigorous activity (minutes/week)	358	56	388	39	481	55	382	27	295	30
Hours of sleep:										
Sleep ≤ 6 hours	26.3%	5.2%	30.3%	3.0%	30.4%	1.4%	23.4%	1.7%	29.0%	2.6%
Sleep 7-8 hours	62.7%	6.0%	60.7%	2.7%	60.3%	2.0%	67.6%	2.8%	54.7%	3.1%
Sleep ≥ 9 hours	11.1%	4.4%	9.0%	1.6%	9.4%	1.2%	9.0%	1.7%	16.2%	2.4%
Session Time:										
Morning	36.0%	4.7%	44.7%	3.8%	50.5%	2.6%	54.8%	2.4%	52.6%	4.5%
Midday	50.2%	4.5%	44.6%	3.6%	39.1%	2.2%	37.1%	2.1%	38.0%	3.6%
Afternoon	13.8%	5.0%	10.6%	2.1%	10.4%	2.1%	8.1%	1.1%	9.4%	1.9%

Supplemental Table 1 (Continued). Demographic, lifestyle, and health characteristics across categories of serum osmolarity, US adults ≥ 60 years old, NHANES 2011-2014.

	Sosm: <285 mmol/L (n=125)		Sosm: 285-289 mmol/L (n=377)		Sosm: 290-294 mmol/L (n=896)		Sosm: 295-300 mmol/L (n=793)		Sosm: >300 mmol/L (n=315)	
	Weighted Means	SE	Weighted Means	SE	Weighted Means	SE	Weighted Means	SE	Weighted Means	SE
Kilocalories	1863	107	1947	75	1848	23	1901	44	1863	51
Caffeine (mg)	211	28	193	23	184	12	177	10	153	17
Alcohol (g)	12	4	9	1	8	1	6	1	7	2
Total water intake moisture (gm)	3142	113	2870	94	2727	70	2639	82	2438	73
Meeting EFSA AI ^b	72.2%	4.2%	66.5%	3.3%	62.4%	2.6%	57.3%	2.9%	50.5%	3.5%
≥ 1 ml/kcal and ≥ 1500 mL/day	82.5%	4.8%	74.5%	3.4%	71.8%	2.5%	71.1%	2.1%	66.5%	3.4%
Blood Glucose (mmol/L)	5.3	0.2	5.3	0.1	5.7	0.1	6.2	0.1	7.8	0.2
Diabetes (Diagnosed or HbA1c $\geq 6.5\%$)	7.6%	2.5%	11.8%	2.2%	17.5%	1.7%	22.0%	1.9%	43.4%	3.8%
Sodium (mmol/L)	133.7	0.2	137.6	0.1	139.4	0.1	140.9	0.1	141.9	0.2
Low sodium (<135 mmol/L)	44.4%	6.1%	1.8%	0.7%	0.7%	0.5%	0.2%	0.1%	0.4%	0.3%
High sodium (>145 mmol/L)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.1%	1.8%
Potassium (mmol/L)	4.0	0.1	3.9	0.0	4.0	0.0	4.1	0.0	4.3	0.0
Blood Urea Nitrogen (mmol/L)	4.2	0.2	4.8	0.1	5.2	0.1	6.1	0.1	8.4	0.3
eGFR (mL/min/1.73 m ²)	80.1	1.8	78.2	0.6	76.5	0.6	71.7	0.6	59.3	2.0
eGFR <60 mL/min/1.73 m ²	13.2%	3.5%	14.3%	1.8%	15.7%	1.7%	24.2%	2.1%	49.1%	4.9%
Hours fasting at time of blood draw	5.9	0.6	6.7	0.4	7.3	0.3	7.7	0.2	7.6	0.4

Supplemental Table 2: Linear regression analyses estimating relationships between dehydration (Sosm>300 mmol/L) and cognitive performance test scores among women and men ≥60 years old, NHANES 2011-2014.^a

VARIABLES	Women (n=1,271) ^b				Men (n=1,235) ^b			
	CERAD-IR	CERAD-DR	AFT	DSST	CERAD-IR	CERAD-DR	AFT	DSST
Sosm ≤300 mmol/L	REF	REF	REF	REF	REF	REF	REF	REF
Sosm >300 mmol/L	0.8* (0.4)	0.4 (0.3)	-0.4 (0.4)	-1.7 (1.2)	1.2** (0.5)	0.5* (0.3)	-0.01 (0.6)	0.1 (1.2)
Age (5 yrs)	-1.0*** (0.1)	-0.5*** (0.1)	-1.1*** (0.1)	-4.7*** (0.3)	-1.0*** (0.1)	-0.5*** (0.1)	-0.9*** (0.2)	-3.6*** (0.3)
< High school	REF	REF	REF	REF	REF	REF	REF	REF
High school graduate	1.5*** (0.4)	0.4* (0.3)	1.6*** (0.3)	8.4*** (1.1)	0.4 (0.4)	-0.2 (0.3)	-0.3 (0.6)	7.5*** (1.8)
Some college	1.8*** (0.5)	0.6** (0.2)	2.6*** (0.3)	12.4*** (1.3)	1.9*** (0.5)	0.6*** (0.2)	2.4*** (0.6)	11.7*** (1.1)
College graduate+	2.9*** (0.5)	1.1*** (0.3)	4.8*** (0.5)	15.4*** (1.5)	2.1*** (0.6)	0.5* (0.3)	3.9*** (0.5)	16.6*** (1.4)
Physical activity (≥150 mins/week)	0.5* (0.3)	0.3** (0.1)	1.1*** (0.3)	3.1*** (0.8)	0.3 (0.3)	0.1 (0.2)	1.1** (0.5)	2.8*** (0.9)
Sleep, 7-8 hours	REF	REF	REF	REF	REF	REF	REF	REF
Sleep, ≤6 hours	-0.1 (0.3)	0.3* (0.1)	-0.2 (0.4)	0.03 (0.9)	-0.4 (0.4)	-0.01 (0.2)	-0.4 (0.4)	0.3 (1.2)
Sleep, ≥9 hours	-1.1** (0.5)	-0.3 (0.3)	-1.2** (0.5)	-4.7*** (1.4)	-0.8* (0.4)	-1.1*** (0.3)	-0.7 (0.8)	-1.4 (1.1)
Diabetes (diagnosed or HbA1c≥6.5%)	-0.8** (0.4)	-0.7*** (0.2)	-0.4 (0.4)	-4.2*** (1.1)	-0.4 (0.3)	-0.3 (0.2)	-0.5 (0.6)	-3.2*** (1.1)
Caffeine, 0 mg ^c	REF	REF	REF	REF	REF	REF	REF	REF
Caffeine, >0-200 mg ^c	0.9* (0.5)	0.3 (0.2)	0.5 (0.5)	2.8** (1.1)	0.1 (0.5)	0.3 (0.3)	-0.8 (0.6)	0.5 (1.2)
Caffeine, >200-400 mg ^c	1.2** (0.6)	0.4 (0.3)	0.9 (0.7)	5.5*** (1.5)	0.7 (0.4)	0.7** (0.3)	0.2 (0.5)	1.3 (1.2)
Caffeine, >400 mg ^c	1.0 (0.6)	0.4* (0.3)	-0.2 (0.9)	-0.1 (2.0)	-0.03 (0.6)	0.2 (0.3)	-0.2 (0.7)	-1.1 (1.8)
Alcohol, 0 g ^c	REF	REF	REF	REF	REF	REF	REF	REF
Alcohol, >0-30 g ^c	-0.1 (0.5)	0.1 (0.2)	0.3 (0.5)	3.0** (1.3)	-0.02 (0.4)	-0.1 (0.3)	0.5 (0.5)	1.2 (1.2)
Alcohol, >30 g ^c	-0.4 (0.7)	-0.5 (0.4)	-0.1 (0.6)	2.9 (2.2)	-0.2 (0.4)	0.2 (0.3)	0.6 (0.7)	2.4 (1.7)
R-squared	0.20	0.19	0.30	0.47	0.19	0.19	0.23	0.45

Standard errors in parentheses

*** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

Notes: Constant not shown; REF=Reference category; CERAD-IR=Consortium to Establish a Registry for Alzheimer's Disease (CERAD) Word Learning- Immediate Recall; CERAD-DR=CERAD Word Learning - Delayed Recall; AFT=Animal Fluency Test. DSST=Digit Symbol Substitution Test.

^a Adjusted for covariates shown and covariates not shown (race/Hispanic origin, time of exam, number of hours between last meal and blood draw, and BMI).

^b Unweighted sample size

^c Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.

Supplemental Table 3: Quadratic relationships between calculated serum osmolarity (Sosm) and cognitive performance test scores among women and men ≥ 60 years old, NHANES 2011-2014.^a

VARIABLES	Women (n=1,271) ^b				Men (n=1,235) ^b			
	CERAD-IR	CERAD-DR	AFT	DSST	CERAD-IR	CERAD-DR	AFT	DSST
Sosm (mmol/L)	0.7 (1.1)	0.2 (0.8)	0.8 (1.5)	10.0** (4.0)	-0.2 (1.2)	0.6 (0.5)	0.8 (1.4)	8.4** (3.1)
Sosm squared	-0.001 (0.002)	-0.0002 (0.001)	-0.001 (0.002)	-0.02** (0.01)	0.0004 (0.002)	-0.0009 (0.0009)	-0.001 (0.002)	-0.01** (0.005)
Age (5 yrs)	-1.0*** (0.1)	-0.5*** (0.1)	-1.1*** (0.1)	-4.7*** (0.3)	-1.0*** (0.1)	-0.5*** (0.1)	-0.9*** (0.2)	-3.7*** (0.3)
< High school	REF	REF	REF	REF	REF	REF	REF	REF
High school graduate	1.4*** (0.4)	0.4* (0.2)	1.6*** (0.4)	8.0*** (1.1)	0.4 (0.4)	-0.2 (0.3)	-0.3 (0.6)	7.5*** (1.8)
Some college	1.8*** (0.5)	0.6** (0.2)	2.6*** (0.3)	12.1*** (1.2)	1.9*** (0.5)	0.6*** (0.2)	2.4*** (0.6)	11.6*** (1.2)
College graduate+	2.9*** (0.4)	1.0*** (0.3)	4.7*** (0.5)	14.9*** (1.5)	2.1*** (0.6)	0.5* (0.3)	3.9*** (0.5)	16.6*** (1.4)
Physical activity (≥ 150 mins/week)	0.5* (0.3)	0.3** (0.1)	1.1*** (0.3)	3.0*** (0.8)	0.3 (0.3)	0.2 (0.1)	1.1** (0.5)	2.9*** (0.9)
Sleep, 7-8 hours	REF	REF	REF	REF	REF	REF	REF	REF
Sleep, ≤ 6 hours	-0.1 (0.3)	0.3** (0.1)	-0.2 (0.4)	-0.1 (0.9)	-0.3 (0.4)	0.02 (0.2)	-0.4 (0.4)	0.3 (1.2)
Sleep, ≥ 9 hours	-1.1** (0.5)	-0.3 (0.3)	-1.3** (0.5)	-5.0*** (1.5)	-0.6 (0.5)	-1.0*** (0.3)	-0.6 (0.8)	-1.0 (1.1)
Diabetes (diagnosed or HbA1c $\geq 6.5\%$)	-0.7* (0.4)	-0.6*** (0.2)	-0.5 (0.5)	-4.0*** (1.1)	-0.4 (0.4)	-0.3 (0.2)	-0.5 (0.6)	-3.2*** (1.1)
Caffeine, 0 mg ^c	REF	REF	REF	REF	REF	REF	REF	REF
Caffeine, >0-200 mg ^c	0.9* (0.5)	0.3 (0.2)	0.5 (0.5)	2.9** (1.1)	0.2 (0.5)	0.4 (0.3)	-0.7 (0.6)	0.6 (1.2)
Caffeine, >200-400 mg ^c	1.3** (0.5)	0.4 (0.3)	0.9 (0.7)	5.5*** (1.4)	0.7 (0.5)	0.7** (0.3)	0.2 (0.6)	1.3 (1.2)
Caffeine, >400 mg ^c	1.0 (0.7)	0.4* (0.3)	-0.2 (0.9)	-0.2 (2.0)	0.1 (0.6)	0.2 (0.3)	-0.2 (0.8)	-0.9 (1.9)
Alcohol, 0 g ^c	REF	REF	REF	REF	REF	REF	REF	REF
Alcohol, >0-30 g ^c	-0.1 (0.5)	0.1 (0.2)	0.3 (0.5)	3.1** (1.3)	-0.1 (0.4)	-0.1 (0.3)	0.5 (0.5)	1.0 (1.3)
Alcohol, >30 g ^c	-0.4 (0.7)	-0.5 (0.4)	-0.1 (0.6)	2.8 (2.3)	-0.2 (0.4)	0.2 (0.3)	0.6 (0.7)	2.5 (1.6)
R-squared	0.20	0.19	0.30	0.48	0.19	0.19	0.23	0.46

Standard errors in parentheses
 *** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

Notes: Constant not shown; REF=Reference category; CERAD-IR=Consortium to Establish a Registry for Alzheimer's Disease (CERAD) Word Learning– Immediate Recall; CERAD-DR=CERAD Word Learning – Delayed Recall; AFT=Animal Fluency Test. DSST=Digit Symbol Substitution Test.

^a Adjusted for covariates shown and covariates not shown (race/Hispanic origin, time of exam, number of hours between last meal and blood draw, and BMI).

^b Unweighted sample size

^c Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.

Supplemental Table 4: Sensitivity analyses estimating relationships between calculated serum osmolarity (Sosm) and cognitive performance test scores among women and men ≥ 60 years old, NHANES 2011-2014

VARIABLES	Women (n=1,201) ^b				Men (n=1,160) ^b			
	CERAD- IR	CERAD- DR	AFT	DSST	CERAD- IR	CERAD- DR	AFT	DSST
	Calculated Sosm							
285-289 mmol/L	REF	REF	REF	REF	REF	REF	REF	REF
<285 mmol/L	0.1 (0.6)	0.2 (0.3)	0.6 (0.8)	-0.8 (2.3)	-0.2 (1.1)	0.4 (0.5)	0.4 (1.0)	-1.3 (4.3)
290-294 mmol/L	-0.2 (0.3)	0.1 (0.2)	-1.2** (0.5)	-3.2*** (1.2)	1.0 (0.6)	0.4* (0.2)	1.0 (0.8)	1.6* (1.0)
295-300 mmol/L	-0.1 (0.5)	0.1 (0.2)	-0.2 (0.6)	-3.0* (1.5)	1.1** (0.5)	0.7*** (0.2)	1.0 (0.8)	2.9** (1.1)
>300 mmol/L	0.9 (0.6)	0.6* (0.3)	-0.7 (0.7)	-3.5* (2.0)	2.2*** (0.8)	1.1** (0.4)	1.2 (0.9)	2.6* (1.5)
Age (5 yrs)	-1.0*** (0.1)	-0.5*** (0.1)	-1.1*** (0.1)	-4.7*** (0.3)	-0.9*** (0.1)	-0.5*** (0.1)	-0.9*** (0.2)	-3.6*** (0.3)
< High school	REF	REF	REF	REF	REF	REF	REF	REF
High school graduate	1.6*** (0.4)	0.4* (0.2)	1.8*** (0.4)	9.0*** (1.1)	0.2 (0.4)	-0.3 (0.3)	-0.4 (0.6)	6.6*** (1.5)
Some college	1.6*** (0.5)	0.6** (0.2)	2.5*** (0.4)	11.9*** (1.3)	1.8*** (0.5)	0.5** (0.2)	2.2*** (0.6)	11.6*** (1.3)
College graduate+	2.6*** (0.4)	1.0*** (0.3)	4.6*** (0.5)	14.5*** (1.6)	1.9*** (0.7)	0.4 (0.3)	3.6*** (0.6)	16.3*** (1.5)
Physical activity (≥ 150 mins/week)	0.4 (0.3)	0.3** (0.1)	1.0*** (0.3)	2.8*** (0.7)	0.2 (0.3)	0.1 (0.1)	1.1** (0.5)	2.7*** (0.9)
Sleep, 7-8 hours	REF	REF	REF	REF	REF	REF	REF	REF
Sleep, ≤ 6 hours	0.01 (0.3)	0.3** (0.1)	-0.2 (0.4)	0.3 (0.8)	-0.4 (0.4)	0.00 (0.2)	-0.4 (0.4)	-0.1 (1.1)
Sleep, ≥ 9 hours	-0.9* (0.5)	-0.3 (0.3)	-1.0* (0.5)	-4.1*** (1.5)	-0.6 (0.4)	-1.0*** (0.3)	-0.6 (0.9)	-1.1 (1.3)
Diabetes (diagnosed or HbA1c $\geq 6.5\%$)	-0.4 (0.4)	-0.5*** (0.2)	-0.5 (0.5)	-3.5*** (1.2)	-0.1 (0.4)	-0.03 (0.2)	-0.1 (0.6)	-2.8** (1.2)
Caffeine, 0 mg ^c	REF	REF	REF	REF	REF	REF	REF	REF
Caffeine, >0-200 mg ^c	0.8 (0.5)	0.2 (0.2)	0.3 (0.5)	2.6** (1.1)	0.03 (0.5)	0.4 (0.3)	-0.7 (0.6)	-0.03 (1.3)
Caffeine, >200-400 mg ^c	1.1* (0.6)	0.3 (0.3)	0.8 (0.7)	5.6*** (1.5)	0.6 (0.5)	0.7** (0.3)	0.3 (0.6)	0.9 (1.3)
Caffeine, >400 mg ^c	1.0 (0.7)	0.4 (0.3)	-0.2 (0.8)	-0.2 (2.1)	0.1 (0.6)	0.3 (0.3)	0.1 (0.7)	-2.1 (2.0)
Alcohol, 0 g ^c	REF	REF	REF	REF	REF	REF	REF	REF
Alcohol, >0-30 g ^c	0.2 (0.5)	0.1 (0.2)	0.3 (0.5)	3.5** (1.3)	-0.2 (0.4)	-0.2 (0.3)	0.5 (0.6)	0.8 (1.2)
Alcohol, >30 g ^c	-0.7 (0.6)	-0.6 (0.4)	-0.3 (0.6)	2.0 (2.1)	-0.2 (0.4)	0.2 (0.3)	0.5 (0.7)	2.5 (1.7)

Glucose (mmol/L)	-0.1 (0.1)	-0.1 (0.1)	-0.03 (0.1)	-0.2 (0.2)	-0.1 (0.1)	-0.1*** (0.04)	-0.1 (0.1)	-0.3 (0.3)
Glucose squared	0.01 (0.02)	0.01 (0.01)	-0.005 (0.02)	-0.1** (0.04)	0.001 (0.01)	0.01 (0.005)	0.01 (0.01)	0.04 (0.03)
eGFR \geq 60 mL/min/1.73 m ²	REF	REF	REF	REF	REF	REF	REF	REF
eGFR <60 mL/min/1.73 m ²	-0.7* (0.4)	-0.1 (0.1)	-0.4 (0.4)	-2.3** (1.1)	-0.8* (0.4)	-0.3 (0.2)	-0.9* (0.4)	-0.7 (0.9)
R-squared	0.21	0.19	0.31	0.50	0.19	0.19	0.23	0.46

Standard errors in parentheses

*** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

Notes: Constant not shown; REF=Reference category; CERAD-IR=Consortium to Establish a Registry for Alzheimer's Disease (CERAD) Word Learning- Immediate Recall; CERAD-DR=CERAD Word Learning - Delayed Recall; AFT=Animal Fluency Test. DSST=Digit Symbol Substitution Test.

^a This model includes covariates for eGFR<60 and blood glucose (mmol/L) and excludes participants who consumed fewer than 500 calories the day before, fasting for more than 18 hours, had blood glucose levels<3 mmol/L, and/or had a serum sodium level <135 mmol/L. Adjusting for covariates shown and covariates not shown (race/Hispanic origin, time of exam, number of hours between last meal and blood draw, and BMI).

^b Unweighted sample size.

^c Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.

Supplemental Table 5: Linear regression analyses estimating relationships between alternative measure of adequate water intake (≥ 1 ml/kcal and minimum 1500 mL) and cognitive performance test scores among women and men ≥ 60 years old, NHANES 2011-2014.^a

VARIABLES	Women (n=1,271) ^b				Men (n=1,235) ^b			
	CERAD-IR	CERAD-DR	AFT	DSST	CERAD-IR	CERAD-DR	AFT	DSST
Meeting alternative AI ^c	REF	REF	REF	REF	REF	REF	REF	REF
Not meeting alternative AI ^c	-0.5* (0.3)	-0.2 (0.2)	-1.0** (0.4)	-2.2** (1.0)	-0.01 (0.3)	0.03 (0.2)	-0.7 (0.4)	-1.5* (0.8)
Age (5 yrs)	-1.0*** (0.1)	-0.5*** (0.1)	-1.0*** (0.1)	-4.7*** (0.3)	-0.9*** (0.1)	-0.5*** (0.1)	-0.9*** (0.2)	-3.5*** (0.2)
< High school	REF	REF	REF	REF	REF	REF	REF	REF
High school graduate	1.4*** (0.5)	0.4 (0.3)	1.5*** (0.3)	8.2*** (1.1)	0.4 (0.4)	-0.2 (0.3)	-0.3 (0.6)	7.5*** (1.8)
Some college	1.7*** (0.5)	0.6** (0.3)	2.5*** (0.3)	12.2*** (1.3)	1.9*** (0.5)	0.6*** (0.2)	2.3*** (0.7)	11.4*** (1.2)
College graduate+	2.7*** (0.5)	1.0*** (0.3)	4.6*** (0.5)	14.9*** (1.6)	2.1*** (0.7)	0.5* (0.3)	3.8*** (0.5)	16.4*** (1.4)
Physical activity (≥ 150 mins/week)	0.4 (0.3)	0.3** (0.1)	1.0*** (0.3)	2.8*** (0.8)	0.2 (0.3)	0.1 (0.1)	1.0* (0.5)	2.7*** (0.9)
Sleep, 7-8 hours	REF	REF	REF	REF	REF	REF	REF	REF
Sleep, ≤ 6 hours	-0.1 (0.3)	0.3** (0.1)	-0.2 (0.4)	0.1 (0.9)	-0.4 (0.4)	-0.00 (0.2)	-0.3 (0.4)	0.3 (1.2)
Sleep, ≥ 9 hours	-1.1** (0.5)	-0.3 (0.3)	-1.2** (0.5)	-4.8*** (1.4)	-0.7* (0.4)	-1.0*** (0.3)	-0.7 (0.8)	-1.5 (1.1)
Diabetes (diagnosed or HbA1c $\geq 6.5\%$)	-0.6* (0.4)	-0.6*** (0.2)	-0.5 (0.4)	-4.4*** (1.1)	-0.2 (0.3)	-0.2 (0.2)	-0.4 (0.6)	-3.1*** (1.1)
Caffeine, 0 mg ^d	REF	REF	REF	REF	REF	REF	REF	REF
Caffeine, >0-200 mg ^d	0.8 (0.5)	0.2 (0.2)	0.3 (0.5)	2.3** (1.0)	0.01 (0.5)	0.3 (0.3)	-0.8 (0.6)	0.3 (1.1)
Caffeine, >200-400 mg ^d	1.0* (0.6)	0.3 (0.3)	0.6 (0.7)	4.6*** (1.4)	0.5 (0.4)	0.7** (0.3)	-0.00 (0.5)	0.8 (1.1)
Caffeine, >400 mg ^d	0.6 (0.7)	0.3 (0.3)	-0.8 (0.8)	-1.4 (1.9)	-0.2 (0.6)	0.1 (0.3)	-0.5 (0.7)	-1.9 (1.8)
Alcohol, 0 g ^d	REF	REF	REF	REF	REF	REF	REF	REF
Alcohol, >0-30 g ^d	-0.2 (0.5)	0.01 (0.2)	0.1 (0.5)	2.7* (1.4)	-0.01 (0.4)	-0.1 (0.3)	0.5 (0.5)	1.1 (1.3)
Alcohol, >30 g ^d	-0.6 (0.7)	-0.5 (0.4)	-0.3 (0.7)	2.4 (2.3)	-0.3 (0.4)	0.2 (0.3)	0.5 (0.7)	2.2 (1.6)
R-squared	0.21	0.19	0.31	0.48	0.18	0.18	0.23	0.46

Standard errors in parentheses

*** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

Notes: Constant not shown. REF=Reference category; CERAD-IR=Consortium to Establish a Registry for Alzheimer's Disease (CERAD) Word Learning– Immediate Recall; CERAD-DR=CERAD Word Learning – Delayed Recall; AFT=Animal Fluency Test. DSST=Digit Symbol Substitution Test.

^a Adjusted for covariates shown and covariates not shown (race/Hispanic origin, time of exam, number of hours between last meal and blood draw, BMI, and estimated calorie intake on previous day).

^b Unweighted sample size

^c Alternative AI defined as ≥ 1 ml/kcal and minimum 1500 mL of total water from foods and beverages. Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.

^d Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.

eGFR <60 mL/min/1.73 m ²	-0.4 (0.3)	-0.006 (0.1)	-0.3 (0.4)	-2.2** (1.0)	-0.5 (0.4)	-0.1 (0.2)	-0.8 (0.5)	-0.3 (0.8)
R-squared	0.21	0.19	0.31	0.50	0.18	0.18	0.23	0.46

Standard errors in parentheses

*** $P < 0.01$, ** $P < 0.05$, * $P < 0.1$

Notes: Constant not shown; REF=Reference category; CERAD-IR=Consortium to Establish a Registry for Alzheimer's Disease (CERAD) Word Learning– Immediate Recall; CERAD-DR=CERAD Word Learning – Delayed Recall; AFT=Animal Fluency Test. DSST=Digit Symbol Substitution Test.

^a This model includes covariates for eGFR<60 and blood glucose (mmol/L) and excludes participants who consumed fewer than 500 calories the day before, fasting for more than 18 hours, had blood glucose levels<3 mmol/L, and/or had a serum sodium level <135 mmol/L. Adjusting for covariates shown and covariates not shown (race/Hispanic origin, time of exam, number of hours between last meal and blood draw, BMI, and estimated calorie intake on previous day).

^b Alternative AI defined as ≥ 1 ml/kcal and minimum 1500 mL of total water from foods and beverages. Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.

^d Estimated from one 24 hour-recall on foods and beverages consumed from midnight to midnight the day prior to the exam.