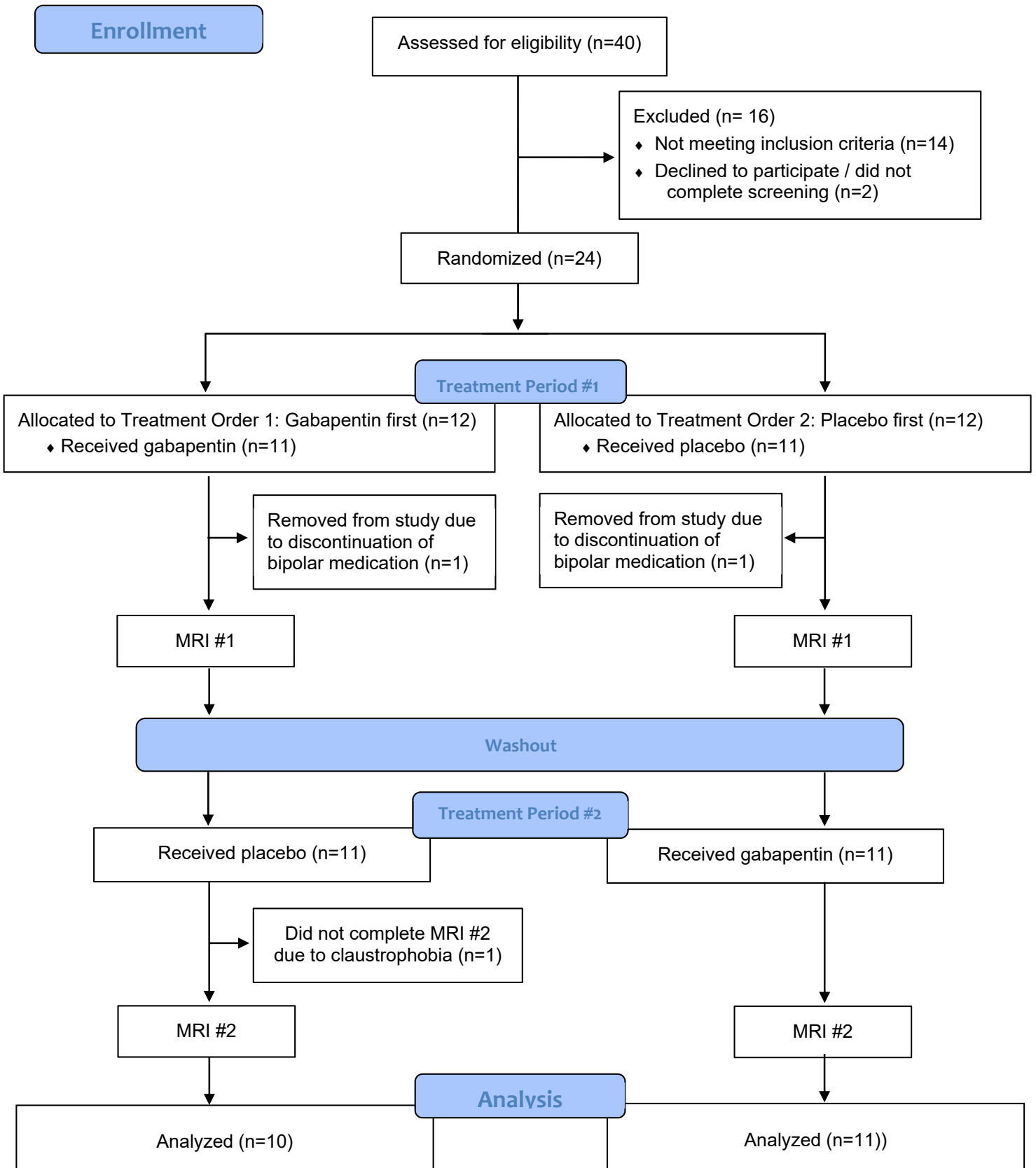


Supplemental Figure 1. CONSORT 2010 Flow Diagram



BASELINE EVALUATION: VISIT 1 (V1)



CONDITION A: Gabapentin*

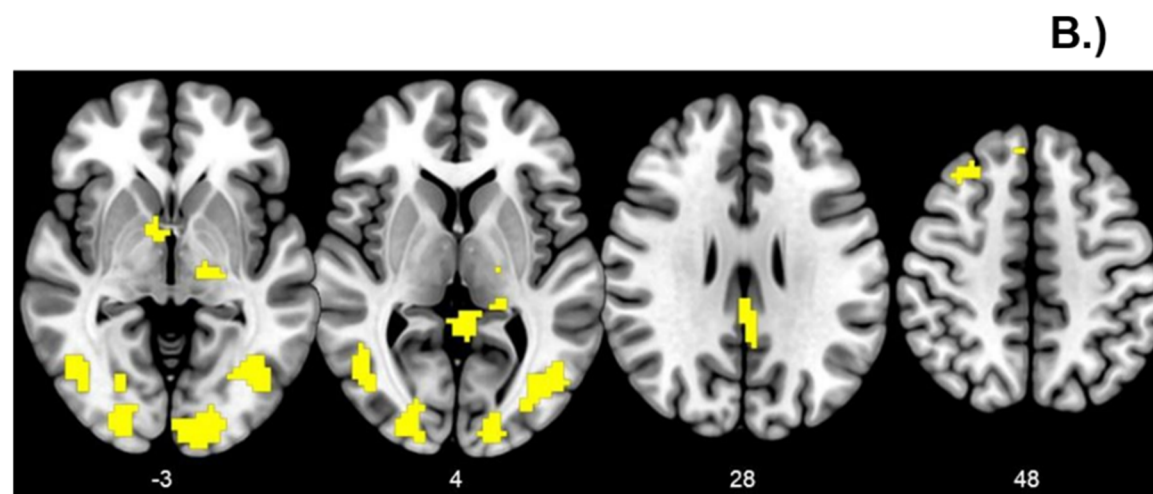
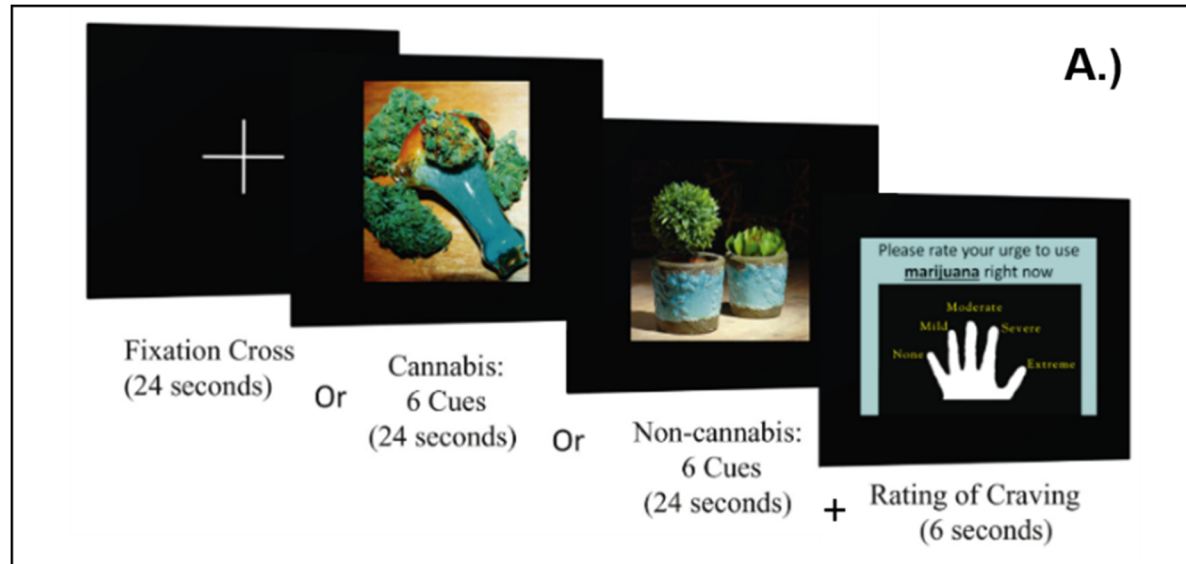
Condition Day	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		
AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Dose (in mg)	300	300	300	600	600	600	600	600	600	600	Washout	Washout	Washout	Washout	Washout
Study Visit	V2: Med Disp								V3:MRI						



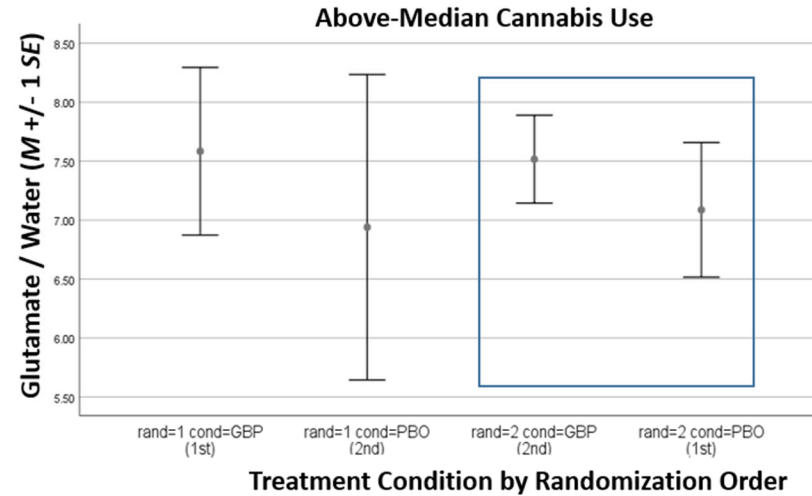
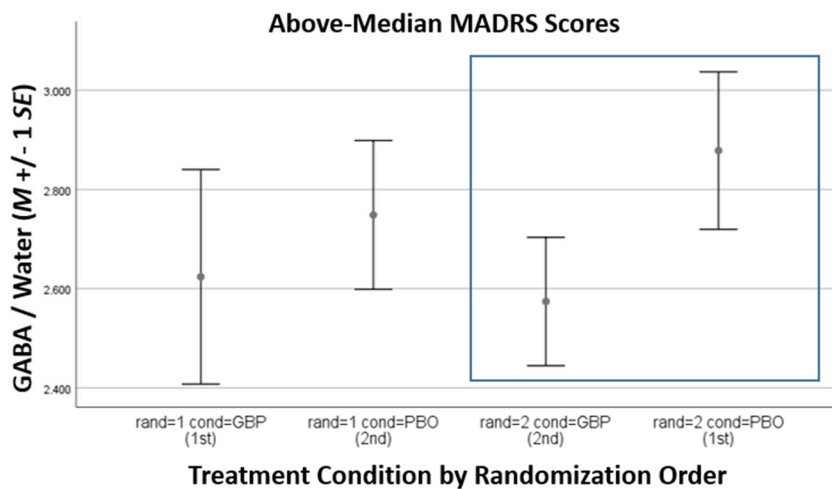
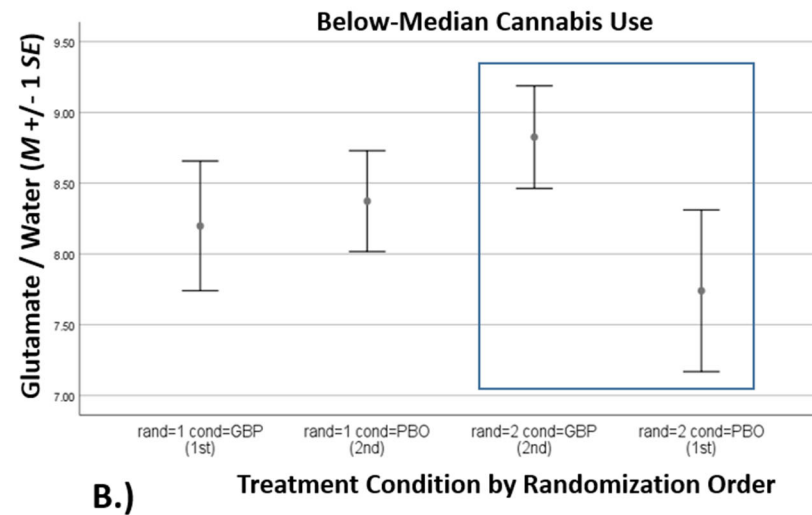
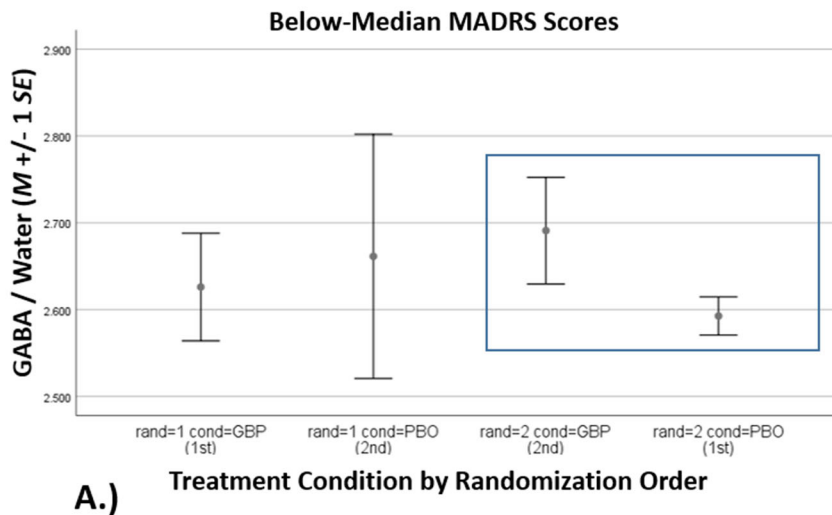
CONDITION B: Placebo*

Condition Day	Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		
AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Dose (in mg)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Washout	Washout	Washout	Washout	Washout
Study Visit	V4: Med Disp								V5:MRI						

Supplemental Figure 2. Study design schematic. *Condition order was randomized between participants. Med Disp = Medication Dispensing.



Supplemental Figure 3. A.) Cannabis Cue Reactivity fMRI task schematic. Each task epoch included a fixation cross block, cannabis cue image block, and neutral image block; after each block, participants rate their “urge to use marijuana.” Adapted from *Karoly, 2019*. B) Cannabis cue minus neutral-image activation (yellow) in BD+CUD participants while on placebo, after controlling for condition order ($z > 2.58$, FWE-corrected $p < 0.05$). Activated regions included, R pallidum, bilateral thalamus and L posterior cingulate ($k = 995$, $p_{FWE} = 0.001$; peak: $x = 9$, $y = 2$, $z = -4$), R superior and middle frontal gyrus ($k = 657$, $p_{FWE} = 0.010$; peak coordinate: $x = 33$, $y = 29$, $z = 47$), and L occipital cortex ($k = 2389$, $p_{FWE} < 0.001$; peak: $x = -36$, $y = -70$, $z = 5$).



Supplemental Figure 4. A.) dACC GABA levels by treatment condition (GBP = gabapentin, PBO = placebo) and randomization order (rand) by depressive symptom (MADRS) scores during the study (top = below-median MADRS scores, bottom = above-median MADRS scores). B.) rBG glutamate levels by treatment condition (GBP = gabapentin, PBO = placebo) and randomization order (rand) by cannabis use during the study (top = below-median cannabis use, bottom = above-median cannabis use).

Body System Adverse Event	Placebo (% reporting, N=22)	Gabapentin (% reporting, N=22)	P-value*
Gastrointestinal			
Abdominal cramps	1 (4.5)	0	1.00
Diarrhea	0	1 (4.5)	1.00
Nausea	2 (9.1)	0	1.00
Vomiting	1 (4.5)	0	1.00
Increased appetite	1 (4.5)	0	1.00
Neurological			
Fatigue	2 (9.1)	2 (9.1)	1.00
Somnolence	0	1 (4.5)	1.00
Dizziness	1 (4.5)	1 (4.5)	1.00
Headache	2 (9.1)	0	0.50
Blepharospasm	0	1 (4.5)	1.00
Psychiatric			
Insomnia	1 (4.5)	0	1.00
Memory impairment	0	1 (4.5)	1.00
	11	7	
All reported AEs	0	0	
Serious AEs			

*Supplemental Table 1. Adverse Events. Summary of all adverse events reported per treatment condition. *P-value comparing treatment condition using McNemar's test.*