Title:	**Middle Cerebral Artery Occlusion in Male Sprague Dawley Rats**

Procedure	**Cylinder Test**

Cylinder Test

The cylinder test (modified from Schallert and Tillerson, in Innovative Models of CNS Disease from: Molecule to Therapy. Clifton, NJ, Humana, 1999) is used to quantify the forelimb use asymmetry while the animal is rearing against the wall in the test cage. The rats are monitored as they move freely in their test cage. The first contact made by each forepaw(s) with the cage wall during a rear is scored. A total of 20 contacts or the contacts in a eight minute period are recorded for each animal, and the number of impaired (left) and non-impaired forelimb contacts as percentage of total contacts is calculated in the following formula

(L+(B/2)/total rears)*100.

Project Title	Middle Cerebral Artery Occlussion in Male Sprague Dawley Rats
Species	Rat
Strain	Sprague Dawley
Sex	Male
Age	approximately 9 weeks at start

Subjects

Group	n	Treatment
Sham	8	none
MCAO	12	75 min MCAO

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Cylinder Test		Baseline 1				Baseline 2				Day 3				Day 8			
Animal	Group	Left	Right	Both	Score	Left	Right	Both	Score	Left	Right	Both	Score	Left	Right	Both	Score
1	MCAO	1	11	8	25.00	5	8	7	42.50	9	8	3	52.50	6	5	9	52.50
2	MCAO	7	6	7	52.50	7	9	4	45.00	2	8	0	20.00				
3	MCAO	1	10	9	27.50	3	7	10	40.00	1	3	0	25.00				
5	MCAO	7	4	9	57.50	12	7	1	62.50	2	18	0	10.00	1	18	1	7.50
7	MCAO	2	13	5	22.50	5	9	6	40.00	0	12	0	0.00	0	19	1	2.50
9	MCAO	4	3	13	52.50	6	4	10	55.00	0	20	0	0.00	0	20	0	0.00
10	MCAO	3	6	11	42.50	8	4	8	60.00	0	14	2	6.25	0	16	4	10.00
13	MCAO	8	2	10	65.00	9	5	6	60.00	0	2	0	0.00	1	16	3	12.50
15	MCAO	6	5	9	52.50	1	11	8	25.00	0	19	1	2.50	0	15	5	12.50
16	MCAO	5	3	13	54.76	3	4	13	47.50	0	13	7	17.50	3	7	10	40.00
18	MCAO	4	9	7	37.50	5	5	10	50.00	1	19	0	5.00	0	17	3	7.50
19	MCAO	7	4	9	57.50	1	6	13	37.50	2	16	2	15.00	0	15	5	12.50
4	Sham	4	1	15	42.50	8	2	10	65.00	8	4	8	60.00	6	5	9	52.50
6	Sham	13	3	4	75.00	5	11	4	35.00	9	9	2	50.00	9	8	3	52.50
8	Sham	4	4	12	50.00	4	9	7	37.50	2	12	5	23.68	0	10	10	25.00
11	Sham	6	5	9	52.50	3	9	8	35.00	6	10	4	40.00	5	10	5	37.50
12	Sham	6	4	10	55.00	6	10	4	40.00	6	5	9	52.50	5	5	10	50.00
14	Sham	6	10	4	40.00	6	7	7	47.50	3	13	4	25.00	0	14	6	15.00
17	Sham	9	9	2	50.00	8	5	7	57.50	8	5	7	57.50	7	7	6	50.00
20	Sham	2	5	13	42.50	0	3	17	42.50	0	5	15	37.50	3	6	11	42.50

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		Day 11				Day 15				Day 17				Day 22			
Animal	Group	Left	Right	Both	Score	Left	Right	Both	Score	Left	Right	Both	Score	Left	Right	Both	Score
1	MCAO	7	2	11	62.50	11	1	8	75.00	8	0	12	70.00	14	0	6	85.00
2	MCAO																
3	MCAO																
5	MCAO	2	12	6	25.00	3	10	7	32.50	4	13	3	27.50	2	12	6	25.00
7	MCAO	0	18	2	5.00	0	19	1	2.50	0	19	1	2.50	0	17	3	7.50
9	MCAO	0	18	2	5.00	0	15	5	12.50	0	16	4	10.00	0	12	8	20.00
10	MCAO	0	15	5	12.50	2	8	8	33.33	1	12	7	22.50	1	9	10	30.00
13	MCAO	0	15	5	12.50	0	13	7	17.50	0	11	9	22.50	1	5	14	40.00
15	MCAO	0	19	1	2.50	0	20	0	0.00	0	20	0	0.00	1	16	3	12.50
16	MCAO	1	13	6	20.00	0	17	3	7.50	0	16	4	10.00	0	18	2	5.00
18	MCAO	0	15	5	12.50	0	14	6	15.00	0	14	6	15.00	0	12	8	20.00
19	MCAO	0	14	6	15.00	0	15	5	12.50	0	13	7	17.50	0	11	9	22.50
4	Sham	10	3	7	67.50	10	1	9	72.50	4	2	14	55.00	7	3	10	60.00
6	Sham	9	4	7	62.50	5	3	12	55.00	14	2	4	80.00	5	3	12	55.00
8	Sham	5	7	8	45.00	6	4	10	55.00	6	5	9	52.50	4	3	13	52.50
11	Sham	5	5	10	50.00	3	7	10	40.00	5	9	6	40.00	1	3	16	45.00
12	Sham	6	4	10	55.00	4	2	14	55.00	10	3	7	67.50	1	4	15	42.50
14	Sham	2	13	5	22.50	1	14	5	17.50	3	12	5	27.50	0	12	8	20.00
17	Sham	3	6	11	42.50	6	7	2	46.67	9	3	8	65.00	6	3	11	57.50
20	Sham	3	4	13	47.50	4	0	16	60.00	2	3	15	47.50	3	1	16	55.00

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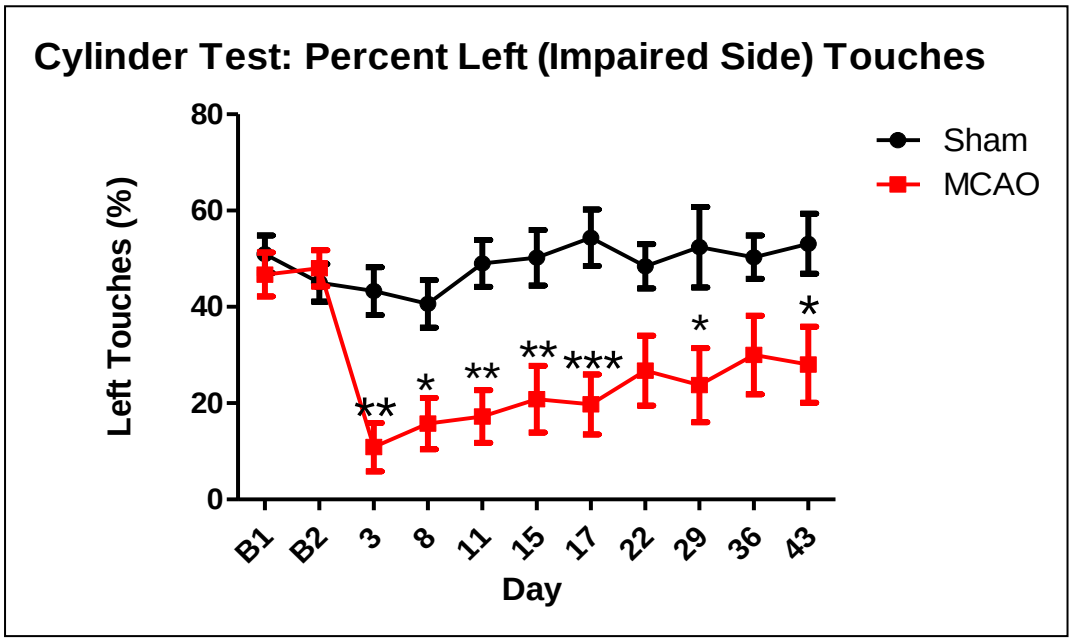
		Day 29				Day 36				Day 43			
Animal	Group	Left	Right	Both	Score	Left	Right	Both	Score	Left	Right	Both	Score
1	MCAO	14	0	6	85.00	17	0	3	92.50	15	0	5	87.50
2	MCAO												
3	MCAO												
5	MCAO	1	10	9	27.50	2	7	11	37.50	1	13	6	20.00
7	MCAO	0	19	1	2.50	0	18	2	5.00	0	17	3	7.50
9	MCAO	0	14	6	15.00	0	12	8	20.00	0	12	8	20.00
10	MCAO	1	6	13	37.50	0	9	11	27.50	1	7	12	35.00
13	MCAO	0	10	10	25.00	0	3	17	42.50	0	3	17	42.50
15	MCAO	1	17	2	10.00	0	19	1	2.50	1	18	1	7.50
16	MCAO	0	20	0	0.00	0	16	4	10.00	0	17	3	7.50
18	MCAO	2	15	3	17.50	2	9	9	32.50	0	15	5	12.50
19	MCAO	0	13	7	17.50	0	8	12	30.00	0	4	16	40.00
4	Sham	4	2	14	55.00	8	1	11	67.50	9	2	9	67.50
6	Sham	13	2	5	77.50	7	3	10	60.00	7	1	12	65.00
8	Sham	2	6	12	40.00	4	5	11	47.50	3	2	15	52.50
11	Sham	3	6	11	42.50	5	2	13	57.50	2	0	18	55.00
12	Sham	6	4	10	55.00	5	4	11	52.50	5	2	13	57.50
14	Sham	0	18	2	5.00	2	12	6	25.00	1	16	3	12.50
17	Sham	9	2	5	71.88	4	5	11	47.50	5	5	10	50.00
20	Sham	9	0	11	72.50	3	5	12	45.00	8	2	10	65.00



Analysis with two-way ANOVA shows a significant deficit in the cylinder test from day 3 until the last time point taken on day 43. ($P<0.001$ on day 17. $P<0.01$ on days 3, 11, 15. $P<0.05$ on days 8, 29, 43)

Conclusion:

This study was intended to identify motor deficits in male Sprague Dawley rats following a 75 minute MCAO. The cylinder test was used to test for asymmetry in forelimb usage. MCAO rats showed a significant decrease in usage of their impaired forelimb while rearing post MCAO on days 3, 8, 11, 15, 17, 29, and 43 after analysis with a two-way ANOVA. Rats in the sham group continued to use both their left and right forelimbs equally.