
**Standard Operating Procedure
Center for Systems Neurogenetics of Addiction (CSNA)**

**Open Field Assay
OF v1.0**



Area: G3	JAX-CSNA-BPC
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Controls:	
Superseded Document	N/A, New
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Major or Minor changes	N/A, New
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Signatures:	
Author	I indicate that I have authored or updated this SOP according to applicable business requirements and our company procedure: Preparing and Updating Standard Operating Procedures. Name: _____ Ashley Olson _____ Signature: _____ Date: _____ 5/1/2017 _____
Approver	I indicate that I have reviewed this SOP, and find it meets all applicable business requirements and that it reflects the procedure described. I approve it for use. Name: _____ Leona Gagnon _____ Signature: _____ Date: _____ Reviewed 1/1/2019 _____

1. PURPOSE

This SOP addresses the routine procedures used for conducting the open field assay in mice including methods for analysis of data, and quality monitoring procedures.

2. SCOPE

The SOP applies to laboratories within the JAX CSNA Behavioral Phenotyping Core.

3. RESPONSIBILITIES

3.1. Laboratory Staff

3.1.1. Remain up to date in training with this SOP

3.1.2. Comply with this SOP

3.2. Principal Investigator/Core Manager of JAX-CSNA-BPC

3.2.1. Ensures that all personnel involved running this SOP are trained to comply with this SOP

4. GLOSSARY/DEFINITIONS

4.1. Definitions

Item	Definition
Arena Grid	The arena uses a 16x16 grid of infrared beams to measure the locomotor activity of an animal. Each 1x1 square within the grid is equivalent to 1 square inch (2.54cm).
Ambulatory Distance	The total number of centimeters (cm) traveled in the arena throughout the duration of the test as defined by the instrument.
Time Spent at Center	The total time (seconds) spent in the center portion of the open field arena. This area is defined as the center 10 x 10

	square matrix. Increases in center time may be indicative of anxiolytic-like activity.
Time in perimeter zones	Time spent (seconds) by the animal in proximity to the walls of the arena. This area is defined as the exterior 3x16 and 16x3 matrices for the left right bottom and top regions.
Resting Time	The length of time (seconds) that the subject spent at rest. A resting period is defined as a period of inactivity greater than or equal to 1 second.
Vertical Activity	The total number of vertical beam breaks.
Time Bin (Sample Duration)	The duration (seconds) for each timepoint in which data is analyzed. In the current protocol, time bins are set at 300 seconds (5 minutes).
Total duration of experiment (sec)	The duration of the experiment (sec). In the current protocol the duration of the experiment is 3600 sec (60 minutes).
Zone Top Left Corner	The upper left corner 3x3 matrix of the arena floor.
Zone Top Right Corner	The upper right corner 3x3 matrix of the arena floor.
Zone Top Perimeter	The upper perimeter 3x10 matrix of the arena between the Zone Top Left Corner and Zone Top Right Corner.
Zone Right Perimeter	The right perimeter 3x 10 matrix of the arena floor between the Zone Bottom Right Corner and Zone Top Right Corner.
Zone Bottom Right Corner	The lower right corner 3x3 matrix of the arena floor.
Zone Bottom Left Corner	The lower left corner 3x3 matrix of the arena floor.
Zone Bottom Perimeter	The upper perimeter 3x10 matrix of the arena floor between the Zone Bottom Left Corner and Zone Bottom Right Corner.
Zone Left Perimeter	The right perimeter 3x10 matrix of the arena floor between the Zone Bottom Left Corner and Zone Top Left Corner.

4.2. Procedure Inputs

Procedure Name	Variable	Type	comment
OpenField	Protocol	Input	protocol version
OpenField	Group	Input	Subject Group
OpenField	Subject	Input	Subject ID
OpenField	Experimenter	Input	ExperimenterID
OpenField	Session Number	Input	Session Number
OpenField	Session ID	Input	Session ID
OpenField	Start Time	Input	Start date and time
OpenField	Session Duration	Input	Session duration
OpenField	Session Comment	Input	Comments
OpenField	Hole Board Installed	Input	Presence or absence of holeboard
OpenField	Time Bin Interval	Input	Time bin interval
OpenField	Number of Time Bins	Input	Total number of bins
OpenField	Chamber	Input	Chamber ID
OpenField	SoftwareVersion	Input	Software version

4.3. Procedure Outputs

Please see section 7 Variables

5. MATERIALS

5.1 Instrumentation

5.1.1. Open Field Arena: A square shaped, clear polycarbonate arena (Med-Associates #MED-OFAS-515U) with dimensions 17.5 inches length x 17.5 inches width x 10.0 inches height (44.5 cm x 44.5 cm x 25.4 cm). Removable clear acrylic, aerated lids were custom manufactured and are placed on top of arenas during testing. External to the perimeter of the arena at the level of the floor, on the left and right sides is a pair of horizontal infrared photobeam sensors (16 x 16 beam array). An additional pair of infrared photobeam sensors raised 3 inches from the arena floor (16 x 16 array) are situated at the front and rear external sides of the arena and used to capture vertical activity.

5.1.2. Environmental Control Chamber: Each arena is placed within a sound attenuated, ventilated cabinet with interior dimensions: 26"W x 20"H x 22"D (Med Associates, #MED-OFA-017); Each cabinet contains two incandescent lights, each affixed in the upper rear two corners of the cabinet at a height of approximately 18.5 inches from the center of the arena floor which provides an illumination of 60 ± 10 lux when measured in the center of arena floor.

5.1.3. Activity Monitor software: 7.0.5.10 SOF-812 (Med Associates, Inc.).

5.1.5 Forceps: Metal tongs used to handle all mouse transfers.

5.2. Consumables

5.2.1. 70% ethanol (ETOH) in water solution: used to sanitize the arena between subjects

5.2.2. Virkon Wipes: 1% Virkon (Virkon S Lanxess in water) working solution used to sanitize the arena between test cohorts of mice.

5.2.3. Paper towels

5.2.4. Spor-Klenz: Spor-Klenz working solution (1 part Spor-Klenz Steris Life Science Concentrate to 32 parts water) used to sterilize forceps between animals.

6. PROCEDURE

6.1. Environment

6.1.1. Procedure Room. The dimensions of the procedure room are approximately 20' 9" x 10' 2". 24 arenas, each placed within its own environmental chamber are double stacked and located on both sides of the room (chambers # 1-24).

6.1.2. Anteroom. An anteroom located adjacent to the procedure room (~ 15 feet) is used to acclimate mice prior to the test as in 6.3 below.

6.1.3. Temperature. The temperature range in the testing room is $71 \pm 3^\circ$ F.

6.1.4. Humidity. The humidity range in the procedure room is $50 \pm 20\%$.

6.1.5. Lighting. Room lighting in the testing room is overhead florescent lights with a dimmer switch illuminated to the maximal setting to produce a light level in the testing room of ~ 500 lux. Lighting within the behavioral chambers is provided by two 28 V lamps and measures 14 lux at the testing floor. Light lux levels are validated monthly.

- 6.1.6. Noise. The ambient background noise level in the procedure room is 55-70 dB. Fans within the environmental control chambers mask background noise. Audible timers are not used during this test. Noise levels are validated monthly.
- 6.1.7. Visual Cues. No intended visual cues are provided within the testing chambers.
- 6.1.8. Time of day. The test is conducted during the light phase of the circadian cycle; beginning at least 60 min after the lights on and concluding at least 30 min prior to lights off.

6.2. Subjects

6.2.1. Species. Mice

- 6.2.1.1. Study specific animals (e.g, strain, sex, date of birth) ordered or bred and documented.

- 6.2.1.2. Receipt of animals logged (e.g., date of arrival)

6.2.2. Sex. Males or females

6.2.3. Age. The test is validated for mice 8-12 weeks of age.

6.2.4. Housing. Subjects are individually housed for this test with ad lib access to food and water. (View CSNA Housing SOP for more details.

6.2.5. Husbandry. Cage change occurs once a week and is not performed on the same day as testing. The cages are changed on the same day every week. In the current protocol cages are changed on Fridays of each week. Open field testing is scheduled on Mondays.

6.2.6. Subject Identification. Mice within a cage are marked by ear punches. Ear punches are performed at 6 weeks of age, at the same time that they are individually housed.

6.2.7. Counterbalance. Subjects are pre-assigned a test chamber. Every attempt is made to test mixed batches of strains and/or sexes such that each session does not include only animals from a single strain or sex and counterbalanced across test chambers. A list of subjects IDs, date of test, date of birth, weight, sex, and genotype when available should be prepared prior to testing. Any comments or unexpected observations regarding the session should be noted either generally or in reference to a specific animal, in the run sheet.

6.3. Testing

- 6.3.1. Acclimation. Subjects are transported from the housing room to the procedure room on a wheeled rack and left undisturbed to acclimate to the anteroom adjacent to the procedure room for a minimum of 30 minutes. At the conclusion of the acclimation period, the wheeled rack is

transported into the procedure room and mice are immediately placed into the chambers as in 6.3.4. below. Enter test day information in the laboratory notebook in the room, as indicated in book.

6.3.2. Sanitization. Prior to the first mouse placed into any arena, and between subjects, the chamber is thoroughly sanitized with 70% ETOH solution (in water), and the box is wiped dry with clean paper towels.

6.3.3. System Set up.

6.3.3.1. Turn on both Computers, the power to the fans and lights (switches are on the back right of each control unit 6 total), and the Interface Cabinets (Green toggle switch on the front right of the cabinet three total).

6.3.3.2. Activity Monitor Testing. Prior to testing mice, the Activity Monitor settings must be adjusted to run the protocol properly. Click *Activity Monitor* (v7.0.5.10 SOF-812).

6.3.3.2.1. Within Activity Monitor, click *Configure Hardware* under the file tab.

6.3.3.2.2. Click the box next to *Node* so all boxes become checked, Click *Detect*, make sure all boxes say “Yes” under connected column and “Ok” under status column (This is to ensure all boxes are connected correctly and on).

6.3.3.2.3. Click *Configure* button.

6.3.3.2.4. In the Configure Chambers window, ensure *All Selected Devices* is selected, Type indicates *ENV- 515 -43cm x 43cm*, resolution (ms) is *40*, and Samples Per Second is set to *25*. Make sure the “Hole Board Installed” check box is not checked. Click *Apply* and *Ok*.

6.3.3.2.5. Back in ENV-520 Device Properties window select *Test* and make sure the Status for all chambers is “Ok”. Click *Ok* and *Apply*.

6.3.3.2.6. Box Check. Prior to any test session, the open field chambers should be tested to confirm that all infrared beams are working properly. In the configure hardware box, click on *Advanced Test*. Click *Start*, make sure that beam breaks start at zero. Then ensure the test indicates that beams are being broken by running a hand along the bottom of each chamber.

6.3.3.3. Activity Monitor Setup. Prior to placing the subjects into the arena, the software must be set up.

6.3.3.3.1. Under File select *Open Project*

- 6.3.3.3.2. In file menu (This PC > Documents) select the project that contains the OpenField protocol
 - 6.3.3.3.3. In the Project box click *Acquire Data...*
 - 6.3.3.3.4. The Acquire Data window will open. Under Protocol select the protocol that has OpenField acquisition settings with a duration of 60 minutes with the task floor in use. Verify the time bins are set at 300 sec time bins.
 - 6.3.3.3.5. The acquisition page should be filled out according to the run sheet, with the subject ID typed into the corresponding chamber of the subject column, the session column will read the date and the number test of the day (EX: YYYYMMDD_Test#), and the testers' initials entered into the comment column. Then click *Start*.
- 6.3.3.4. Follow the steps 6.3.3.2 – 6.3.3.3 for both computers to have all 24 chambers started for testing.
- 6.3.4. Placement into the arena. At the start of each testing session, subjects are individually placed into the center of the arena, facing the rear of the chamber. The lid is then placed atop the arena and the chamber door is closed. The tracking software detects the mouse in the arena and starts automatically. Load subjects into each chamber in sequential chamber numbering order. As each subject is loaded, the tester should briefly examine each mouse, health concerns should be noted in the run sheet.
- 6.3.5. Test Duration. The tracking software automatically ends the tracking for the subject 60 minutes after the mouse was initially detected by the software. The environmental chambers are not opened and the subject is not removed from any arena until testing concludes for all arenas in that session.
- 6.3.6. At the conclusion of the session, the test chamber is opened and subjects are returned to their respective home cages. Arenas are sanitized as described above. Mice are transported back to their housing room. The next set of subjects are not placed into the arenas until all the arenas have been sanitized.
- 6.3.7. Repeat 6.3.1 through 6.3.6 for subsequent groups of mice.
- 6.3.8. At the conclusion of all testing for the day, the subjects are returned to the housing room and the arenas are sanitized with Virkon followed by 70% ETOH to remove any Virkon residue.

6.4. Data Analysis and QC

- 6.4.1. Export. Data are exported from the behavioral tracking software into an excel file.

- 6.4.1.1. Select “Analyze Data” under the Novelty Tests Project page.
- 6.4.1.2. Select OpenField under the Analysis, Zones, and Protocol.
- 6.4.1.3. Select the Group names that was used to indicate the groups that need to be analyzed.
- 6.4.1.4. When the data is finished being analyzed, select spreadsheet and excel from the drop down menus above the displayed data. Then click “Open” to open the Excel (CSV) file. Save this file with the name format “Test_CU#_yearmonthday.csv” (OF_CU1_20181119.csv).
- 6.4.2. Data Review. Data is reviewed as generated for technical issues (e.g. malfunctioning equipment), verification of subject IDs tested, and any other aberrations which are then flagged for QC review. Observed aberrations are noted on the run sheet.
- 6.4.3. Data Upload. Data uploads are verified and performed as described in the CSNA Data QC and Upload SOP .
- 6.4.4. Results analyzed
 - 6.4.4.1. Data are analyzed over time bins as total distance traveled (cm), perimeter time, center time, and related AUC (as defined in the glossary 4.0 above).
 - 6.4.4.2. Data is archived in several locations at minimum: 1) files are preserved on the testing computer; 2) files are saved on the external hard drive 3) files are saved on a share drive for LIMs QC and upload.

7. Variables

- 7.1. Derived variables : Variables that are derived based on formulae using raw m/c generated variables (7.2). These calculations happen during the upload of data from jaxLIMS into the Mouse Phenome Database (MPD, <https://phenome.jax.org/>). Variables in MPD are stored by mouse population used in the study (in: Inbred, cc: Collaborative Cross, do: Diversity Outbred).

CSNA Variable	MPD Variable Name(s)	Description	Units	Upload to MPD	Required for analysis	Required for QC
total.distance.traveled	dist_OFT_in dist_OFT_cc dist_OFT_do	Open field total distance traveled	cm	Yes	Yes	Yes

total.distance.traveled.in.center	center_dist_OFT_in center_dist_OFT_cc center_dist_OFT_do	Open field total distance in the center	cm	Yes	Yes	Yes
total.distance.traveled.in.corner	dist_corners_OFT_in dist_corners_OFT_cc dist_corners_OFT_do	Open field total distance in the corner	cm	Yes	Yes	Yes
total.distance.traveled.in.perimeter	dist_perimeter_OFT_in dist_perimeter_OFT_cc dist_perimeter_OFT_do	Open field total distance in the perimeter	cm	Yes	Yes	Yes
total.rears	tot_rears_OFT_in tot_rears_OFT_cc tot_rears_OFT_do	Open field total number of rears	count	Yes	Yes	Yes
total.resting.time	rest_time_tot_OFT_in rest_time_tot_OFT_cc rest_time_tot_OFT_do	Open field total time resting	sec	Yes	No	Yes
total.resting.time.in.center	rest_time_center_OFT_in rest_time_center_OFT_cc rest_time_center_OFT_do	Open field total time resting in center	sec	Yes	No	Yes
total.resting.time.in.corner	rest_time_corner_OFT_in rest_time_corner_OFT_cc rest_time_corner_OFT_do	Open field total time resting in corner	sec	Yes	No	Yes
total.resting.time.in.perimeter	rest_time_perimeter_OFT_in rest_time_perimeter_OFT_cc rest_time_perimeter_OFT_do	Open field total time resting in perimeter	sec	Yes	No	Yes
total.time.in.center	center_time_OFT_in center_time_OFT_cc center_time_OFT_do	Open field total time in center	sec	Yes	Yes	Yes
total.time.in.corner	time_corner_OFT_in time_corner_OFT_cc time_corner_OFT_do	Open field total time in corners	sec	Yes	Yes	Yes

total.time.in.perimeter	time_perimeter_OFT_in time_perimeter_OFT_cc time_perimeter_OFT_do	Open field total time in perimeter	sec	Yes	Yes	Yes
distance.traveled.first.five	amb_dist_OFT_in_bin1 amb_dist_OFT_cc_bin1 amb_dist_OFT_do_bin1	Open field distance traveled during the first five mins	cm	Yes	Yes	Yes
distance.traveled.last.five	amb_dist_OFT_in_bin12 amb_dist_OFT_cc_bin12 amb_dist_OFT_do_bin12	Open field distance traveled during the last five mins	cm	Yes	Yes	Yes
pct.dist.center	pct_dist_center_OFT_in pct_dist_center_OFT_cc pct_dist_center_OFT_do	Open field percent center distance	%	Yes	Yes	Yes
pct.dist.corner	pct_dist_perimeter_corners_OFT_in pct_dist_perimeter_corners_OFT_cc pct_dist_perimeter_corners_OFT_do	Open field percent distance in the corner	%	Yes	Yes	Yes
pct.dist.perimeter	pct_dist_perimeter_OFT_in pct_dist_perimeter_OFT_cc pct_dist_perimeter_OFT_do	Open field percent distance in the perimeter	%	Yes	Yes	Yes
pct.resting.time.center	pct_rest_time_center_OFT_in pct_rest_time_center_OFT_cc pct_rest_time_center_OFT_do	Open field percent time spent resting in the center	%	Yes	Yes	Yes

pct.resting.time.corner	pct_rest_time_corner_OFT_in pct_rest_time_corner_OFT_cc pct_rest_time_corner_OFT_do	Open field percent time spent resting in the corner	%	Yes	No	Yes
pct.resting.time.perimeter	pct_rest_time_perimeter_OFT_in pct_rest_time_perimeter_OFT_cc pct_rest_time_perimeter_OFT_do	Open field percent time spent resting in the perimeter	%	Yes	No	Yes
pct.time.center	pct_center_time_OFT_in pct_center_time_OFT_cc pct_center_time_OFT_do	Open field percentage center time	%	Yes	Yes	Yes
pct.time.corner	pct_corner_time_OFT_in pct_corner_time_OFT_cc pct_corner_time_OFT_do	Open field percent time in the corner	%	Yes	Yes	Yes
pct.time.perimeter	pct_time_perimeter_OFT_in pct_time_perimeter_OFT_cc pct_time_perimeter_OFT_do	Open field percent time in the perimeter	%	Yes	Yes	Yes
time.perimeter.less.corner	time_perimeter_corners_OFT_in time_perimeter_corners_OFT_cc time_perimeter_corners_OFT_do	Open field total time in perimeter less corner	sec	Yes	Yes	Yes
total.ambulatory.time	amb_time_OFT_in amb_time_OFT_cc amb_time_OFT_do	Open field total ambulatory time	sec	Yes	No	Yes

distance.traveled.bin0 1	amb_dist_OFT_in_bin1 amb_dist_OFT_cc_bin1 amb_dist_OFT_do_bin1	Open field total distance traveled 0-5 min	cm	Yes	No	Yes
distance.traveled.bin0 2	amb_dist_OFT_in_bin2 amb_dist_OFT_cc_bin2 amb_dist_OFT_do_bin2	Open field total distance traveled 5-10 min	cm	Yes	No	Yes
distance.traveled.bin0 3	amb_dist_OFT_in_bin3 amb_dist_OFT_cc_bin3 amb_dist_OFT_do_bin3	Open field total distance traveled 10-15 min	cm	Yes	No	Yes
distance.traveled.bin0 4	amb_dist_OFT_in_bin4 amb_dist_OFT_cc_bin4 amb_dist_OFT_do_bin4	Open field total distance traveled 15-20 min	cm	Yes	No	Yes
distance.traveled.bin0 5	amb_dist_OFT_in_bin5 amb_dist_OFT_cc_bin5 amb_dist_OFT_do_bin5	Open field total distance traveled 20-25 min	cm	Yes	No	Yes
distance.traveled.bin0 6	amb_dist_OFT_in_bin6 amb_dist_OFT_cc_bin6 amb_dist_OFT_do_bin6	Open field total distance traveled 25-30 min	cm	Yes	No	Yes
distance.traveled.bin0 7	amb_dist_OFT_in_bin7 amb_dist_OFT_cc_bin7 amb_dist_OFT_do_bin7	Open field total distance traveled 30-35 min	cm	Yes	No	Yes
distance.traveled.bin0 8	amb_dist_OFT_in_bin8 amb_dist_OFT_cc_bin8 amb_dist_OFT_do_bin8	Open field total distance traveled 35-40 min	cm	Yes	No	Yes
distance.traveled.bin0 9	amb_dist_OFT_in_bin9 amb_dist_OFT_cc_bin9 amb_dist_OFT_do_bin9	Open field total distance traveled 40-45 min	cm	Yes	No	Yes

distance.traveled.bin10	amb_dist_OFT_in_bin10 amb_dist_OFT_cc_bin10 amb_dist_OFT_do_bin10	Open field total distance traveled 45-50 min	cm	Yes	No	Yes
distance.traveled.bin11	amb_dist_OFT_in_bin11 amb_dist_OFT_cc_bin11 amb_dist_OFT_do_bin11	Open field total distance traveled 50-55 min	cm	Yes	No	Yes
distance.traveled.bin12	amb_dist_OFT_in_bin12 amb_dist_OFT_cc_bin12 amb_dist_OFT_do_bin12	Open field total distance traveled 55-60 min	cm	Yes	No	Yes
distance.traveled.slope	dist_slope_OFT_in dist_slope_OFT_cc dist_slope_OFT_do	Open field distance traveled slope	slope	Yes	Yes	Yes

7.2. Raw output variables

The following variables are identified per bin (5 minute time bin).

Variables	Description	Units	Uploaded to MPD	Required for analysis	Required for QC
Ambulatory.Time.Bin.1.Zone.Bottom.Left.Corner	Open field total time spent traveling 0-5 min Zone Bottom Left Corner	sec	No	No	Yes

Ambulatory.Time.Bin.1.Zone.Bottom.P erimeter	Open field total time spent traveling 0-5 min Zone Bottom Perimeter	sec	No	No	Yes
Ambulatory.Time.Bin.1.Zone.Bottom.R ight.Corner	Open field total time spent traveling 0-5 min Zone Bottom Right Corner	sec	No	No	Yes
Ambulatory.Time.Bin.1.Zone.Center	Open field total time spent traveling 0-5 min Zone Center	sec	No	No	Yes
Ambulatory.Time.Bin.1.Zone.Left.Peri meter	Open field total time spent traveling 0-5 min Zone Left Perimeter	sec	No	No	Yes
Ambulatory.Time.Bin.1.Zone.Right.Peri meter	Open field total time spent traveling 0-5 min Zone Right Perimeter	sec	No	No	Yes

Ambulatory.Time.Bin.1.Zone.Top.Left. Corner	Open field total time spent traveling 0-5 min Zone Top Left Corner	sec	No	No	Yes
Ambulatory.Time.Bin.1.Zone.Top.Peri meter	Open field total time spent traveling 0-5 min Zone Top Perimeter	sec	No	No	Yes
Ambulatory.Time.Bin.1.Zone.Top.Right .Corner	Open field total time spent traveling 0-5 min Zone Top Right Corner	sec	No	No	Yes
Ambulatory.Time.Bin.1	Open field total time spent traveling 0-5 min	sec	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Bottom .Left.Corner	Open field total number of beam breaks 0-5 min Zone Bottom Left Corner	cou nts	No	No	Yes

Ambulatory.Counts.Bin.1.Zone.Bottom .Perimeter	Open field total number of beam breaks 0-5 min Zone Bottom Perimeter	cou nts	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Bottom .Right.Corner	Open field total number of beam breaks 0-5 min Zone Bottom Right Corner	cou nts	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Center	Open field total number of beam breaks 0-5 min Zone Center	cou nts	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Left.Per imeter	Open field total number of beam breaks 0-5 min Zone Left Perimeter	cou nts	No	No	Yes

Ambulatory.Counts.Bin.1.Zone.Right.P erimeter	Open field total number of beam breaks 0-5 min Zone Right Perimeter	cou nts	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Top.Lef t.Corner	Open field total number of beam breaks 0-5 min Zone Top Left Corner	cou nts	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Top.Per imeter	Open field total number of beam breaks 0-5 min Zone Top Perimeter	cou nts	No	No	Yes
Ambulatory.Counts.Bin.1.Zone.Top.Rig ht.Corner	Open field total number of beam breaks 0-5 min Zone Top Right Corner	cou nts	No	No	Yes

Ambulatory.Counts.Bin.1	Open field total number of beam breaks 0-5 min	counts	No	No	Yes
Ambulatory.Distance.Bin.1.Zone.Bottom.Left.Corner	Open field total distance traveled 0-5 min Zone Bottom Left Corner	cm	No	No	Yes
Ambulatory.Distance.Bin.1.Zone.Bottom.Perimeter	Open field total distance traveled 0-5 min Zone Bottom Perimeter	cm	No	No	Yes
Ambulatory.Distance.Bin.1.Zone.Bottom.Right.Corner	Open field total distance traveled 0-5 min Zone Bottom Right Corner	cm	No	No	Yes
Ambulatory.Distance.Bin.1.Zone.Center	Open field total distance traveled 0-5 min Zone Center	cm	No	No	Yes

<p>Ambulatory.Distance.Bin.1.Zone.Left.P erimeter</p>	<p>Open field total distance traveled 0-5 min Zone Left Perimeter</p>	<p>cm</p>	<p>No</p>	<p>No</p>	<p>Yes</p>
<p>Ambulatory.Distance.Bin.1.Zone.Right. Perimeter</p>	<p>Open field total distance traveled 0-5 min Zone Right Perimeter</p>	<p>cm</p>	<p>No</p>	<p>No</p>	<p>Yes</p>
<p>Ambulatory.Distance.Bin.1.Zone.Top.L eft.Corner</p>	<p>Open field total distance traveled 0-5 min Zone Top Left Corner</p>	<p>cm</p>	<p>No</p>	<p>No</p>	<p>Yes</p>
<p>Ambulatory.Distance.Bin.1.Zone.Top.P erimeter</p>	<p>Open field total distance traveled 0-5 min Zone Top Perimeter</p>	<p>cm</p>	<p>No</p>	<p>No</p>	<p>Yes</p>
<p>Ambulatory.Distance.Bin.1.Zone.Top.R ight.Corner</p>	<p>Open field total distance traveled 0-5 min Zone Top Right Corner</p>	<p>cm</p>	<p>No</p>	<p>No</p>	<p>Yes</p>

Ambulatory.Distance.Bin.1	Open field total distance traveled 0-5 min	cm	No	No	Yes
Ambulatory.Episodes.Bin.1	Open field total number of beam breaks before coming to rest 0-5 min	counts	No	No	Yes
Ambulatory.Episodes.Average.Speed.Bin.1	Open field total number of beam breaks before coming to rest Average Speed 0-5 min	counts	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Bottom.Left.Corner	Open field total time spent in stereotypic behaviors 0-5 min Zone Bottom Left Corner	sec	No	No	Yes

Stereotypic.Time.Bin.1.Zone.Bottom.P erimeter	Open field total time spent in stereotypic behaviors 0-5 min Zone Bottom Perimeter	sec	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Bottom.Ri ght.Corner	Open field total time spent in stereotypic behaviors 0-5 min Zone Bottom Right Corner	sec	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Center	Open field total time spent in stereotypic behaviors 0-5 min Zone Center	sec	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Left.Peri meter	Open field total time spent in stereotypic behaviors 0-5 min Zone Left Perimeter	sec	No	No	Yes

Stereotypic.Time.Bin.1.Zone.Right.Perimeter	Open field total time spent in stereotypic behaviors 0-5 min Zone Right Perimeter	sec	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Top.Left.Corner	Open field total time spent in stereotypic behaviors 0-5 min Zone Top Left Corner	sec	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Top.Perimeter	Open field total time spent in stereotypic behaviors 0-5 min Zone Top Perimeter	sec	No	No	Yes
Stereotypic.Time.Bin.1.Zone.Top.Right.Corner	Open field total time spent in stereotypic behaviors 0-5 min Zone Top Right Corner	sec	No	No	Yes
Stereotypic.Time.Bin.1	Open field total time spent in stereotypic behaviors 0-5 min	sec	No	No	Yes

Stereotypic.Counts.Bin.1.Zone.Bottom. Left.Corner	Open field total number of stereotypic behaviors 0-5 min Zone Bottom Left Corner	cou nts	No	No	Yes
Stereotypic.Counts.Bin.1.Zone.Bottom. Perimeter	Open field total number of stereotypic behaviors 0-5 min Zone Bottom Perimeter	cou nts	No	No	Yes
Stereotypic.Counts.Bin.1.Zone.Bottom. Right.Corner	Open field total number of stereotypic behaviors 0-5 min Zone Bottom Right Corner	cou nts	No	No	Yes
Stereotypic.Counts.Bin.1.Zone.Center	Open field total number of stereotypic behaviors 0-5 min Zone Center	cou nts	No	No	Yes

Stereotypic.Counts.Bin.1.Zone.Left.Perimeter	Open field total number of stereotypic behaviors 0-5 min Zone Left Perimeter	counts	No	No	Yes
Stereotypic.Counts.Bin.1.Zone.Right.Perimeter	Open field total number of stereotypic behaviors 0-5 min Zone Right Perimeter	counts	No	No	Yes
Stereotypic.Counts.Bin.1.Zone.Top.Left.Corner	Open field total number of stereotypic behaviors 0-5 min Zone Top Left Corner	counts	No	No	Yes
Stereotypic.Counts.Bin.1.Zone.Top.Perimeter	Open field total number of stereotypic behaviors 0-5 min Zone Top Perimeter	counts	No	No	Yes

Stereotypic.Counts.Bin.1.Zone.Top.Right.Corner	Open field total number of stereotypic behaviors 0-5 min Zone Top Right Corner	counts	No	No	Yes
Stereotypic.Counts.Bin.1	Open field total number of stereotypic behaviors 0-5 min	counts	No	No	Yes
Jump.Time.Bin.1.Zone.Bottom.Left.Corner	Open field total time spent jumping 0-5 min Zone Bottom Left Corner	sec	No	No	Yes
Jump.Time.Bin.1.Zone.Bottom.Perimeter	Open field total time spent jumping 0-5 min Zone Bottom Perimeter	sec	No	No	Yes

Jump.Time.Bin.1.Zone.Bottom.Right.C orner	Open field total time spent jumping 0-5 min Zone Bottom Right Corner	sec	No	No	Yes
Jump.Time.Bin.1.Zone.Center	Open field total time spent jumping 0-5 min Zone Center	sec	No	No	Yes
Jump.Time.Bin.1.Zone.Left.Perimeter	Open field total time spent jumping 0-5 min Zone Left Perimeter	sec	No	No	Yes
Jump.Time.Bin.1.Zone.Right.Perimeter	Open field total time spent jumping 0-5 min Zone Right Perimeter	sec	No	No	Yes
Jump.Time.Bin.1.Zone.Top.Left.Corner	Open field total time spent jumping 0-5 min Zone Top Left Corner	sec	No	No	Yes

	Open field total time spent jumping 0-5 min					
Jump.Time.Bin.1.Zone.Top.Perimeter	Zone Top Perimeter	sec	No	No	Yes	
	Open field total time spent jumping 0-5 min					
Jump.Time.Bin.1.Zone.Top.Right.Corner	Zone Top Right Corner	sec	No	No	Yes	
	Open field total time spent jumping 0-5 min					
Jump.Time.Bin.1		sec	No	No	Yes	
	Open field total jumps 0-5 min					
Jump.Counts.Bin.1.Zone.Bottom.Left.Corner	Zone Bottom Left Corner	counts	No	No	Yes	
	Open field total jumps 0-5 min					
Jump.Counts.Bin.1.Zone.Bottom.Perimeter	Zone Bottom Perimeter	counts	No	No	Yes	

Jump.Counts.Bin.1.Zone.Bottom.Right. Corner	Open field total jumps 0-5 min Zone Bottom Right Corner	cou nts	No	No	Yes
Jump.Counts.Bin.1.Zone.Center	Open field total jumps 0-5 min Zone Center	cou nts	No	No	Yes
Jump.Counts.Bin.1.Zone.Left.Perimete r	Open field total jumps 0-5 min Zone Left Perimeter	cou nts	No	No	Yes
Jump.Counts.Bin.1.Zone.Right.Perimet er	Open field total jumps 0-5 min Zone Right Perimeter	cou nts	No	No	Yes
Jump.Counts.Bin.1.Zone.Top.Left.Corn er	Open field total jumps 0-5 min Zone Top Left Corner	cou nts	No	No	Yes
Jump.Counts.Bin.1.Zone.Top.Perimete r	Open field total jumps 0-5 min Zone Top Perimeter	cou nts	No	No	Yes

Jump.Counts.Bin.1.Zone.Top.Right.Corner	Open field total jumps 0-5 min Zone Top Right Corner	counts	No	No	Yes
Jump.Counts.Bin.1	Open field total jumps 0-5 min	counts	No	No	Yes
Resting.Time.Bin.1.Zone.Bottom.Left.Corner	Open field total time spent resting 0-5 min Zone Bottom Left Corner	sec	No	No	Yes
Resting.Time.Bin.1.Zone.Bottom.Perimeter	Open field total time spent resting 0-5 min Zone Bottom Perimeter	sec	No	No	Yes
Resting.Time.Bin.1.Zone.Bottom.Right.Corner	Open field total time spent resting 0-5 min Zone Bottom Right Corner	sec	No	No	Yes

Resting.Time.Bin.1.Zone.Center	Open field total time spent resting 0-5 min Zone Center	sec	No	No	Yes
Resting.Time.Bin.1.Zone.Left.Perimeter	Open field total time spent resting 0-5 min Zone Left Perimeter	sec	No	No	Yes
Resting.Time.Bin.1.Zone.Right.Perimeter	Open field total time spent resting 0-5 min Zone Right Perimeter	sec	No	No	Yes
Resting.Time.Bin.1.Zone.Top.Left.Corner	Open field total time spent resting 0-5 min Zone Top Left Corner	sec	No	No	Yes
Resting.Time.Bin.1.Zone.Top.Perimeter	Open field total time spent resting 0-5 min Zone Top Perimeter	sec	No	No	Yes

Resting.Time.Bin.1.Zone.Top.Right.Corner	Open field total time spent resting 0-5 min Zone Top Right Corner	sec	No	No	Yes
Resting.Time.Bin.1	Open field total time spent resting 0-5 min	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Bottom.Left.Corner	Open field total time spent rearing 0-5 min Zone Bottom Left Corner	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Bottom.Perimeter	Open field total time spent rearing 0-5 min Zone Bottom Perimeter	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Bottom.Right.Corner	Open field total time spent rearing 0-5 min Zone Bottom Right Corner	sec	No	No	Yes

Vertical.Time.Bin.1.Zone.Center	Open field total time spent rearing 0-5 min Zone Center	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Left.Perimeter	Open field total time spent rearing 0-5 min Zone Left Perimeter	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Right.Perimeter	Open field total time spent rearing 0-5 min Zone Right Perimeter	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Top.Left.Corner	Open field total time spent rearing 0-5 min Zone Top Left Corner	sec	No	No	Yes
Vertical.Time.Bin.1.Zone.Top.Perimeter	Open field total time spent rearing 0-5 min Zone Top Perimeter	sec	No	No	Yes

Vertical.Time.Bin.1.Zone.Top.Right.Corner	Open field total time spent rearing 0-5 min Zone Top Right Corner	sec	No	No	Yes
Vertical.Time.Bin.1	Open field total time spent rearing 0-5 min	sec	No	No	Yes
Vertical.Counts.Bin.1.Zone.Bottom.Left.Cornet	Open field total rears 0-5 min Zone Bottom Left Corner	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Bottom.Perimeter	Open field total rears 0-5 min Zone Bottom Perimeter	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Bottom.Right.Cornet	Open field total rears 0-5 min Zone Bottom Right Corner	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Center	Open field total rears 0-5 min Zone Center	counts	No	No	Yes

Vertical.Counts.Bin.1.Zone.Left.Perimeter	Open field total rears 0-5 min Zone Left Perimeter	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Right.Perimeter	Open field total rears 0-5 min Zone Right Perimeter	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Top.Left.Corner	Open field total rears 0-5 min Zone Top Left Corner	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Top.Perimeter	Open field total rears 0-5 min Zone Top Perimeter	counts	No	No	Yes
Vertical.Counts.Bin.1.Zone.Top.Right.Corner	Open field total rears 0-5 min Zone Top Right Corner	counts	No	No	Yes
Vertical.Counts.Bin.1	Open field total rears 0-5 min	counts	No	No	Yes
Duration.Bin.1.Zone.Bottom.Left.Corner	Open field total time spent 0-5 min Zone Bottom Left Corner	sec	No	No	Yes

Duration.Bin.1.Zone.Bottom.Perimeter	Open field total time spent 0-5 min Zone Bottom Perimeter	sec	No	No	Yes
Duration.Bin.1.Zone.Bottom.Right.Corner	Open field total time spent 0-5 min Zone Bottom Right Corner	sec	No	No	Yes
Duration.Bin.1.Zone.Center	Open field total time spent 0-5 min Zone Center	sec	No	No	Yes
Duration.Bin.1.Zone.Left.Perimeter	Open field total time spent 0-5 min Zone Left Perimeter	sec	No	No	Yes
Duration.Bin.1.Zone.Right.Perimeter	Open field total time spent 0-5 min Zone Right Perimeter	sec	No	No	Yes
Duration.Bin.1.Zone.Top.Left.Corner	Open field total time spent 0-5 min Zone Top Left Corner	sec	No	No	Yes

Duration.Bin.1.Zone.Top.Perimeter	Open field total time spent 0-5 min Zone Top Perimeter	sec	No	No	Yes
Duration.Bin.1.Zone.Top.Right.Corner	Open field total time spent 0-5 min Zone Top Right Corner	sec	No	No	Yes
Duration.Bin.1	Open field total time spent 0-5 min	sec	No	No	Yes
Zone.Entries.Bin.1.Zone.Bottom.Left.Corner	Open field total zone entries 0-5 min Zone Bottom Left Corner	counts	No	No	Yes
Zone.Entries.Bin.1.Zone.Bottom.Perimeter	Open field total zone entries 0-5 min Zone Bottom Perimeter	counts	No	No	Yes
Zone.Entries.Bin.1.Zone.Bottom.Right.Corner	Open field total zone entries 0-5 min Zone Bottom Right Corner	counts	No	No	Yes

Zone.Entries.Bin.1.Zone.Center	Open field total zone entries 0-5 min Zone Center	cou nts	No	No	Yes
Zone.Entries.Bin.1.Zone.Left.Perimeter	Open field total zone entries 0-5 min Zone Left Perimeter	cou nts	No	No	Yes
Zone.Entries.Bin.1.Zone.Right.Perimeter	Open field total zone entries 0-5 min Zone Right Perimeter	cou nts	No	No	Yes
Zone.Entries.Bin.1.Zone.Top.Left.Corner	Open field total zone entries 0-5 min Zone Top Left Corner	cou nts	No	No	Yes
Zone.Entries.Bin.1.Zone.Top.Perimeter	Open field total zone entries 0-5 min Zone Top Perimeter	cou nts	No	No	Yes
Zone.Entries.Bin.1.Zone.Top.Right.Corner	Open field total zone entries 0-5 min Zone Top Right Corner	cou nts	No	No	Yes

Zone.Entries.Bin.1	Open field total zone entries 0-5 min	cou nts	No	No	Yes
Zone.Latency.Bin.1.Zone.Bottom.Left. Corner	Open field total latency to enter zone 0-5 min Zone Bottom Left Corner	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Bottom.Peri meter	Open field total latency to enter zone 0-5 min Zone Bottom Perimeter	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Bottom.Right .Corner	Open field total latency to enter zone 0-5 min Zone Bottom Right Corner	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Center	Open field total latency to enter zone 0-5 min Zone Center	sec	No	No	Yes

Zone.Latency.Bin.1.Zone.Left.Perimeter	Open field total latency to enter zone 0-5 min Zone Left Perimeter	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Right.Perimeter	Open field total latency to enter zone 0-5 min Zone Right Perimeter	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Top.Left.Corner	Open field total latency to enter zone 0-5 min Zone Top Left Corner	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Top.Perimeter	Open field total latency to enter zone 0-5 min Zone Top Perimeter	sec	No	No	Yes
Zone.Latency.Bin.1.Zone.Top.Right.Corner	Open field total latency to enter zone 0-5 min Zone Top Right Corner	sec	No	No	Yes

	Open field total latency to enter				
Zone.Latency.Bin.1	zone 0-5 min	sec	No	No	Yes