

CANINE NEURO LOCOMOTOR SCALE (cBBB)

Table 1

The canine locomotor rating scale (cBBB) developed for use in dogs with thoracolumbar spinal cord injury. Notable modifications from the rat scale include acceptance of internal paw rotation as normal, removal of tail assessment, and allowance for mild symmetrical truncal sway. Scores are assigned during a 4 min open field assessment of the dog, conducted in a 10 ft diameter space. Two observers are positioned directly across the open field from each other and verbally communicate observations related to score over the course of the 4 min time period. At the end of four minutes, a score is assigned to each hind limb by consensus of both reviewers based on their collective observations.

Score	Description
0	No observable hind limb (HL) movement
1	Slight movement of one or two joints
2	Extensive movement of one joint, or extensive movement of one joint and slight movement of one other joint
3	Extensive movement of two joints
4	Slight movement of all three joints of the HL
5	Slight movement of two joints and extensive movement of the third
6	Extensive movement of two joints and slight movement of the third
7	Extensive movement of all three joints in the HL
8	Plantar placement of the paw with no weight support
9	Plantar placement of the paw with weight support only when stationary, or occasional, frequent or consistent weight-supported dorsal stepping and no plantar stepping
10	Occasional weight-supported plantar steps; no FL–HL coordination
11	Frequent to consistent weight-supported plantar steps <i>and</i> no FL–HL coordination
12	Frequent to consistent weight-supported plantar steps <i>and</i> occasional FL–HL coordination
13	Frequent to consistent weight-supported plantar steps <i>and</i> frequent FL–HL coordination
14	Consistent weight-supported plantar steps, consistent FL–HL coordination, <i>and</i> predominant paw position is <i>externally rotated</i> when it makes initial contact as well as just before it is lifted off; or frequent plantar stepping, consistent FL–HL coordination, and occasional dorsal stepping
15	Consistent plantar stepping and consistent FL–HL coordination <i>and no toe clearance</i> or <i>occasional</i> toe clearance; predominant paw position is <i>parallel</i> to the body or <i>internally rotated</i> at initial contact
16	Consistent plantar stepping and consistent FL–HL coordination and toe clearance occurs <i>frequently</i> ; predominant paw position is parallel or internally rotated at initial contact and <i>externally rotated</i> at liftoff
17	Consistent plantar stepping and consistent FL–HL coordination and toe clearance occurs <i>frequently</i> ; predominant paw position is <i>parallel</i> or <i>internal</i> at initial contact and at liftoff
18	Consistent plantar stepping and consistent FL–HL coordination and toe clearance occurs <i>consistently</i> ; predominant paw position is parallel or internal at initial contact and at liftoff. <i>Trunk instability is present</i>
19	Consistent plantar stepping and consistent FL–HL coordination and toe clearance occurs consistently during forward limb advancement; predominant paw position is parallel or internal at initial contact and at liftoff. <i>Trunk instability is not observed</i>

FL = forelimb; HL = hindlimb.

Song RB, Basso DM, da Costa RC et al. Adaptation of the Basso–Beattie–Bresnahan locomotor rating scale for use in a clinical model of spinal cord injury in dogs. *J Neurosci Methods*. 2016 August 1; 268: 117–124.

Table 2

Operational definitions applied for locomotor scoring using the canine BBB scale.

Term	Definition
Joint movement	Active flexion of the joint. Assessed separately for three joints (hip, stifle, hock) in each HL. Movement is scored if it occurs one or more times during testing
<i>Slight</i> movement	Movement of a joint through less than or equal to 50% of its normal range of motion
<i>Extensive</i> movement	Movement of a joint through more than 50% of its normal range of motion
Plantar placement	The paw is actively placed with the plantar surface resting on the ground
Weight support	Paw is plantar placed and muscle contraction of the limb causes HL extension and elevation of the hindquarter off the ground
Stepping	Weight support is established, the limb is advanced in the forward direction, and weight support is re-established when the paw contacts the ground. Assessed separately for each HL
<i>Plantar</i> stepping	A step is taken with the paw in plantar placement at both lift off and initial contact
<i>Dorsal</i> stepping	Weight is supported through the dorsal surface of the paw at any point during the step cycle
Occasional stepping	Stepping occurs less than half the time the animal is moving forward
Frequent stepping	Stepping occurs more than half the time but less than 95% of the time the animal is moving forward
Consistent stepping	Stepping occurs 95–100% of the time the animal is moving forward and fewer than 5 dorsal steps are observed
Forelimb–hindlimb (FL–HL) coordination	For every FL step taken, a HL step is also taken and the hind limbs alternate in stepping. This parameter is assessed during forward passes
Forward pass	The animal ambulates in a forward trajectory for a distance equal or greater than 3× its body length
Occasional FL–HL coordination	FL–HL coordination is observed at least once but occurs less than or equal to 50% of the instances the animal performs a forward pass
Frequent FL–HL coordination	FL–HL coordination is observed more than half the instances the animal performs forward passes, but at least one pass was observed to be uncoordinated
Consistent FL–HL coordination	All observed forward passes displayed FL–HL coordination
Paw position	Evaluated at lift off and initial contact for each HL during weight supported plantar stepping
External rotation	The paw is rotated externally for the majority of steps
Internal rotation	The paw is rotated internally for the majority of steps
Parallel	The paw is parallel to the body for the majority of steps
Toe clearance	The toe does not drag or scuff against the floor during forward limb advancement. Assessed separately for each HL by listening for scratching or brushing sounds as the animal walks about the open field
Occasional toe clearance	Toe clearance is achieved occasionally during the open field test, but toe drags are heard for most of the steps
Frequent toe clearance	Toe clearance occurs for more than half of the steps but more than 4 toe drags are recorded during a session
Consistent toe clearance	≤4 HL toe drags are heard during the duration of open field testing
Trunk instability	Lateral weight shifts causing an <i>asymmetrical</i> excursion of the trunk to one side, or excursion of the trunk to both sides in a range of motion <i>greater than one trunk' s width</i> , partial collapse of the trunk on one side. Trunk instability is scored if the animal displays this behavior one or more times during a testing session

Adapted from Basso et al. (1995).