

End-Stage Illness Scoring System

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1. Purpose

To establish a guideline for an end-stage illness scoring system to be used for animals displaying severe signs of morbidity, or a moribund state. This guideline does not replace use of common sense and empathy to protect animals from avoidable suffering; the veterinary staff may recommend or mandate euthanasia for animals with scores of 5 or less but with unexpectedly severe experimentally-induced or spontaneous conditions.

2. Definitions

- a. BCS: Body Condition Score. Scale of 1-5. This measurement is preferred over body weight as body weight can increase as tumor burden increases but body condition is actually decreasing.

3. Responsibility

- a. Principal investigator or designated lab member
 - i. Any animal which is found to be at protocol endpoint must be euthanized.
- b. Husbandry staff
 - i. Perform standard daily animal health checks and report ATRs per SOP.
- c. Veterinary staff
 - i. Upon receipt of an ATR, the veterinary technician must conduct a physical exam, noting any pertinent information.
 - ii. Contact the responsible laboratory member as needed.
 - iii. Report any communication issues to the veterinary resident of the area.

4. End-Stage Illness Scoring Procedures

- a. Criteria for Humane End Points
 - i. To better assess degree of morbidity, a scoring system will be used for all animals that show signs of illness. Animals will be graded on appearance, natural behavior, provoked behavior, and body condition score. This scoring system is extensive but not all-inclusive; some animals with conditions or disease severity not described herein may necessitate euthanasia (i.e. excessive tumor burden, extensive or complicated ulceration, etc.).
 - ii. Scoring System
 1. Appearance (This should be assessed while watching the animals in the cage)
 - a. (0) Normal:
 - Bright eyes
 - Shiny, well-groomed hair coat
 - Pink mucous membranes
 - b. (1) Abnormal:
 - Sunken eyes
 - Tail-tucking
 - Unkempt/ruffled or dull hair coat
 - Erection of hair or fur
 - Mild diarrhea or constipation
 - c. (2) Abnormal:
 - Dull or dry eyes or nose
 - Prolonged hunching
 - Dilated pupils
 - Abdominal distension
 - Muscle atrophy
 - Head tilt
 - Grimacing
 - Bruxism (teeth-grinding)
 - Anaphylaxis
 - Severe or ulcerative dermatitis
 - Ulcerated tumors
 - Signs of self-mutilation
 - Distinct jaundice
 - Wound dehiscence or non-healing wound
 - Severe diarrhea or constipation
 - Repeated or severe vomiting
 - Prolonged frank bleeding from any orifice
 - Increased, decreased, or labored breathing or cyanosis (blue color to skin or mucous membranes)
 - Scant or no feces
 - Anuria (lack of urination)

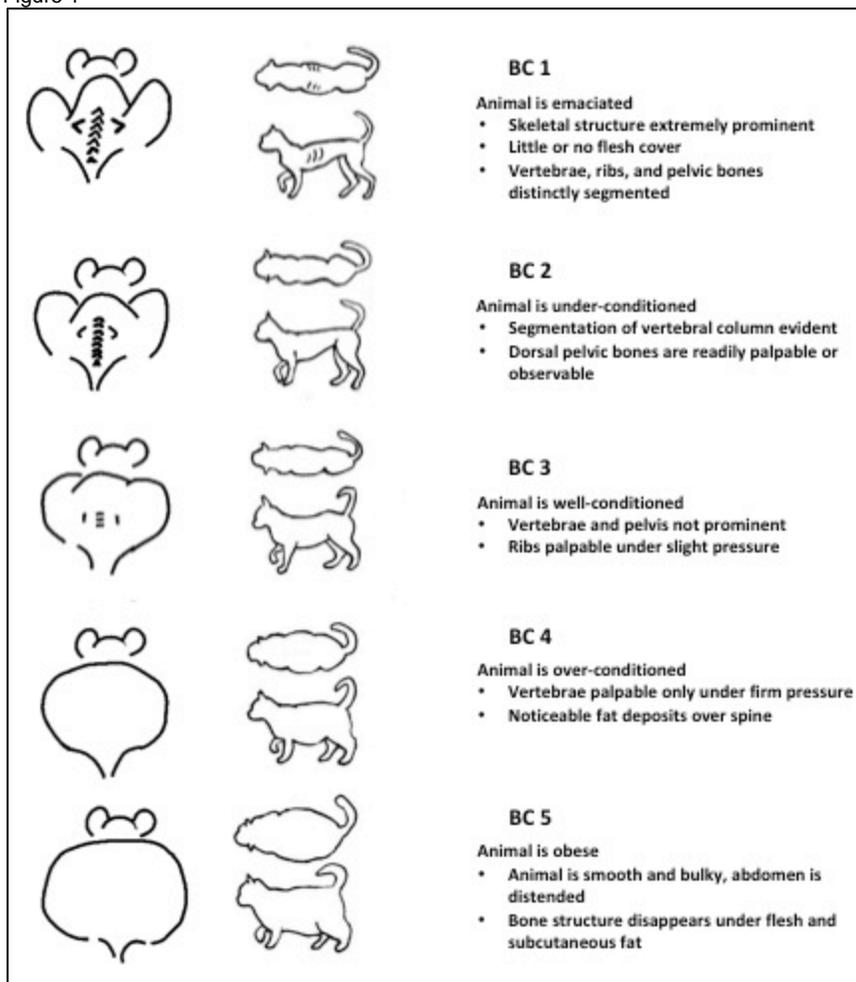
2. Physical Exam Parameters (Evaluation may require assistance from veterinary staff)
 - a. (1) Abnormal:
 - Hypo- or hyperthermia (based on species-specific ranges)
 - b. (2) Abnormal:
 - Clinical dehydration
 - Hematological or biochemical values that indicate organ failure
 - Pale mucous membranes
 - Prolonged capillary refill time
3. Behavior
 - a. (0) Normal:
 - Ambulates easily about the cage
 - Looks at observer
 - Takes interest in the environment
 - Readily walks or runs away or turns to sniff observer
 - Interacts with cagemates/flock
 - b. (1) Abnormal:
 - Slow to move away or hyperactive response inconsistent with gentle nudge
 - Takes less interest in the environment
 - Disregards the observer
 - Interacts less with cagemates/flock
 - Decreased food intake
 - c. (2) Abnormal:
 - Does not move when disturbed
 - Moves away slowly after extended pause
 - Unsteady gait
 - Impaired mobility (can't access food or water)
 - Sits in corner of cage
 - Hypo- or hyperaggression
 - Isolated from cagemates/flock
 - No food intake or prolonged decreased food intake
 - Abnormal or excessive vocalization
 - d. (3) Abnormal:
 - Immobile
 - Writhing
 - Convulsing
 - Reacts with an especially exaggerated or excitable response
 - Unable to remain upright
 - Unconscious with no response to external stimuli
4. Body condition score (Figure 1)
 - a. Assigned a score of 1-5
 - b. To assess BCS, the observer uses the thumb and index finger to palpate the degree of muscle and fat over the sacroiliac region.
 - c. (5) BCS 1 = Emaciated with no palpable fat over the sacroiliac region, severely reduced muscle mass, with prominent vertebrae and iliac crests (emaciated)
 - d. (4) BCS 2 = Some fat deposition and muscle mass with visible iliac crests (thin)
 - e. (0) BCS 3 = Easily palpable fat pads, reduced definition of vertebral bodies, palpable but not visible iliac crests and thick prominent muscle mass (normal)
 - f. (1) BCS 4 = Difficulty in palpating iliac crests, difficulty assessing vertebral definition, and prominent fat pads overlying muscled areas (overweight)
 - g. (2) BCS 5 = Fat pads that overlay muscle and iliac crests thereby obscuring their presence both tactilely and visually and giving the animal's rump a rounded appearance (obese).
5. Total score
 - a. Less than or equal to 3: Routine weekly monitoring (normal).
 - b. 4-5: Demonstrating clinical signs associated with morbidity. Daily monitoring strongly recommended. Consult veterinary staff or outline treatment regime in protocol.
 - c. 6-10: Consult veterinary staff. Consider euthanasia.
 - d. 11-13: Moribund. Euthanize immediately.
6. Guidelines for immediate reporting
 - a. Regardless of the total score, the following conditions should be immediately reported to veterinary staff:
 - Severe or prolonged hunching
 - Clinical dehydration
 - Immobility/Paralysis
 - Inability to access food or water
 - Head tilt
 - Unconsciousness with no response to stimuli
 - Anaphylaxis
 - Anuria (lack of urination)
 - Inability to remain upright
 - Convulsions
 - Signs of self-mutilation
 - Distinct jaundice

- Wound dehiscence or nonhealing wound
- BCS = 1
- Scant or no feces
- Severe or prolonged diarrhea or vomiting
- Prolonged lack of food intake
- Prolonged frank bleeding from any orifice
- Labored breathing or cyanosis (blue color to skin or mucous membranes)

5. Addendum

a. Suggested treatment options for rodents demonstrating signs of morbidity include: placing chow on the cage bottom, utilizing moist chow or Diet Gel, and intraperitoneal (IP) or subcutaneous (SQ) fluids.

b. Figure 1



6. References

- Paster EV, Villines KA, Hickman DL. Endpoints for mouse abdominal tumor models: refinement of current criteria. *Comp Med* 2009;59:234-241.
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