BMSC Animal Care Committee

CCAC Categories of Welfare Impact

The new Categories of Welfare Impact and the old Categories of Invasiveness are not directly interchangeable. A previous COI Category C may not directly translate to a COWI Category C

CCAC Categories of Welfare Impact

Non-surgical and surgical examples are included further down in the document.
Please see the CCAC website for an extensive list of examples:
https://ccac.ca/Documents/Standards/Guidelines/CCAC_guidelines-Categories_of_welfare_impact.pdf

A	**Positive welfare impact** Does **NOT** require approval from the BMSC Animal Care Committee Animal welfare is improved
B	**Mild negative welfare impact** Low severity, low frequency or short duration
C	**Moderate negative welfare impact** Low severity, medium-high frequency or medium-high duration; OR Medium severity, low-medium frequency or short-medium duration
D	**High negative welfare impact** Medium severity, high frequency or long duration; OR High severity, low frequency or short duration
E	**Severe negative welfare impact** High severity, medium-high frequency or medium-long duration

The categories of welfare impact are defined by severity and frequency/duration:

Severity	Frequency or Duration	Category of Welfare Impact
Positive	Any	A – Positive Impact
Low	Low or Short	B – Mild negative Impact
Low Low Medium Medium	Medium High or Long Low or Short Medium	C – Moderate negative Impact
Medium High	High or Long Low or Short	D – High negative impact
High High	Medium High or Long	E – Severe negative impact

Non-surgical examples of scientific procedures – the list below is not absolute, nor is it all encompassing: The BMSC ACC and protocol authors are expected to collectively determine the most appropriate score for the planned procedures. CCAC expects this to be also be an evolving process as users go through the iterative process of prospective and retrospective category assignment.

Surgical examples of scientific procedures – The impact of surgical procedures on animal welfare does not fit well within the severity + frequency/ duration framework. Therefore, the prospective assignment of a category of welfare impact for a surgical procedure should be based on the following criteria:

1. the extent and complexity of the surgical procedure
2. its pathophysiological consequences
3. the consecutive clinical outcomes

Assessing the impact of a surgical procedure should encompass everything from pre-operative preparation to full recovery. The actual welfare impacts of a procedure may vary greatly depending on additional factors such as the use of peri-operative analgesia and the type of anaesthetic used. Therefore, the following examples are intended as helpful starting points for discussion between the BMSC ACC and protocol authors; they are not absolute and the list below is not exhaustive. Retrospective assessment of the outcome of a surgical procedure is especially important as there is potentially more variability in outcome compared to non-surgical procedures.

Non-surgical and surgical examples

A	**Positive welfare impact** **Non-surgical** • Training with positive reinforcement • Evaluation of responses to a positive stimulus with which the animal can choose to interact • Diet preference study where all diets are palatable and nutritionally complete and balanced **Surgical** • None
B	**Mild negative welfare impact (Low severity, Low frequency/duration)** **Non-surgical** • Brief restraint for physical examination of habituated animals • Brief exposure to stimulus that the animals may find mildly stressful, with opportunity to escape • Weighing and/or handling for body condition score of habituated animals • One-time intramuscular injection **Surgical** • Telemetry implants in large fish • Subcutaneous implants
C	**Moderate negative welfare impact (low severity, medium-high frequency/duration, OR medium severity, low-medium frequency/duration)** **Non-surgical** • General anaesthesia caudal vessel blood collection • Oral dosing of novel chemical entities where effect has not been previously characterized • Short periods of food deprivation for longer than would occur in nature • Capture, immobilization, and temporary handling of an animal for marking, taking measurements, and/or fitting a radio collar for telemetry monitoring • Intraperitoneal injections done greater than once every 72 hours • Small wild mammal capture and release • Percutaneous installation of an intravenous catheter in large animals • Anaesthesia and IV catheter installation or subcutaneous pump implant • Monthly ultrasound (including restraint) • Weekly blood sampling • Weekly intraperitoneal injection • Subcutaneous injections done more than once weekly • Daily blood sampling or multiple samples in a day **Surgical** • Surgical implantation of permanent devices (e.g. indwelling femoral catheter) using multimodal analgesia

D	**High negative welfare impact** **Non-surgical** • Repeated social hierarchy disruptions • Prolonged social isolation of social species • Pharmacokinetic study having >10 venipunctures in a 24 hours period where refinement cannot be used to reduce the number of single needle sticks • Sample collections done under multiple general anaesthesia (greater than to general anaesthesia events in 24 hours) • Chronic feed restrictions • Any protocol that causes permanent changes in an animal's physiologic state such that it results in a chronic negative disease condition resulting in a "medium" negative welfare • Daily intravenous or intraperitoneal injections in rodents • Subcutaneous tumour growth in rodent model (non-ulcerated, less than endpoint mass) • Intermittent sleep deprivation • Chronic models of neurodegenerative disease (Alzheimer's) • Protocols that cause prolonged (>4 hr) nausea/vomiting • Large wild mammal capture and release • Metastatic tumour model in rodents with early endpoint • Stroke models done with anaesthetic but with limited analgesia **Surgical** • Surgical castration • Craniotomy
E	**Severe negative welfare impact** **Non-surgical** • Any protocol that causes permanent changes in an animal's physiologic state such that it results in a chronic negative disease condition • Rheumatoid arthritis model with boosters • Lethal dose (LD50) or lethal concentration (LC50) toxicology work • Vaccine or infection models with extreme endpoints • Lipopolysaccharide injections that produce septic shock without analgesia • Model of neuropathic pain with no analgesia provided • Experimental autoimmune encephalomyelitis models • Social defeat model and witness to social defeat model • Live predator-prey interactions, including use of live animals as bait **Surgical** • Sciatic nerve constriction • Parabiosis