

# Welfare Considerations of Killing Methods

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# Pain and Nociception



# Nociception



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**Activity produced in the peripheral and central nervous systems by stimuli that have the potential to damage tissue**





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# Pain

**An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.**

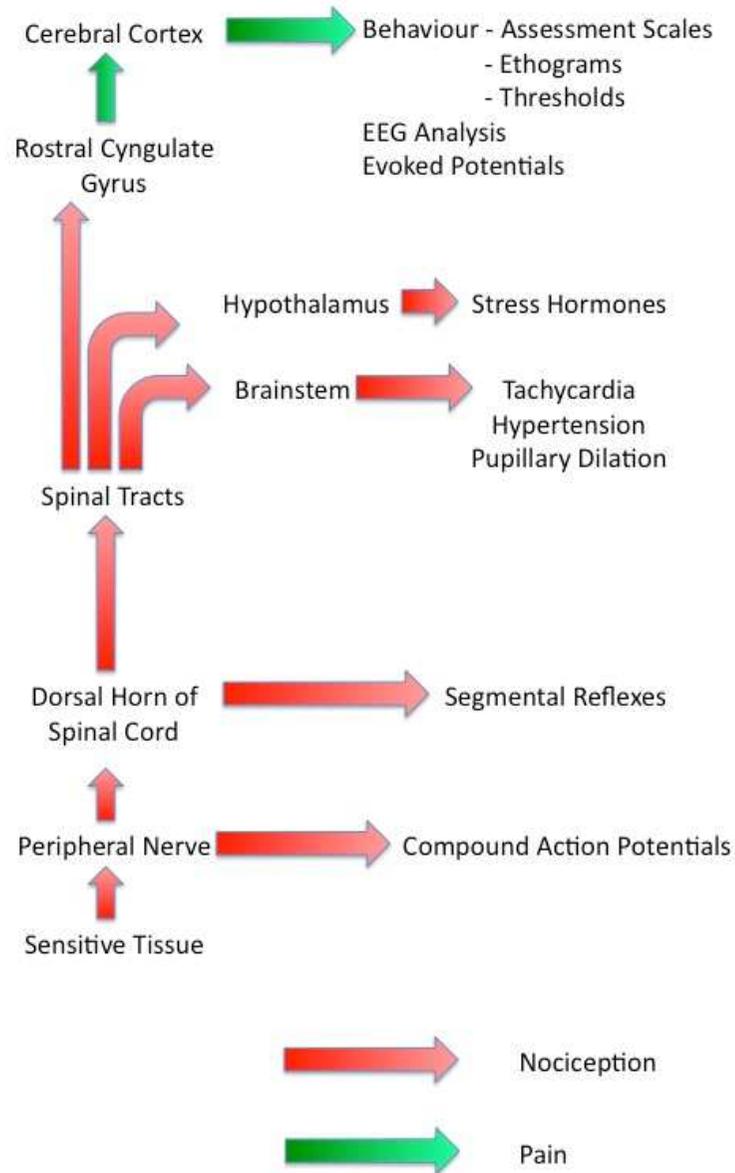
**(IASP)**





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# Pain and Nociception



*Johnson (2016)*

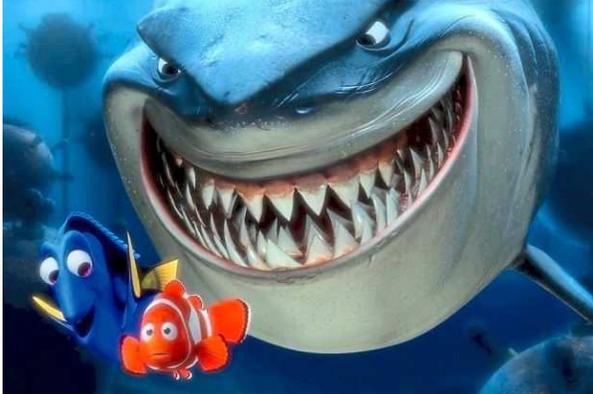






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# The Process of Death



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# The Process of Death



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Normal Function

Hypoxaemia

Exhaustion of ATP Supplies

Collapse of Plasma Membrane  
Potential

Failure of Cellular Integrity

Necrosis



# The Process of Death



ANIMAL WELFARE AOTEAROA

Normal Function

Hypoxaemia

Exhaustion of ATP Supplies

Collapse of Plasma Membrane  
Potential

Failure of Cellular Integrity

Necrosis

Welfare Compromise Possible

Loss of Awareness

Welfare Compromise Not Possible



# The Process of Death

**Compromise to welfare is possible in the period up to the loss of awareness**

**Steps should be taken to:**

**Reduce the duration of this period**

**Avoid Averse Stimuli during this period**



# Features of an Acceptable Method of Killing



**Instantaneous**

**OR**

**Low Experiential Impact**

**Aesthetics are Important but can be Misleading**



# Families of Killing Methods



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## Physical Destruction of CNS

Shooting  
Captive Bolt  
Blunt Force Trauma

## Functional Disruption of CNS

Electrocution  
Poisoning

## Deprivation of CNS

Asphyxia  
Exsanguination



# Families of Killing Methods



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## Physical Destruction of CNS

Shooting  
Captive Bolt  
Blunt Force Trauma

The CNS is physically destroyed to a point where awareness is no longer possible

In some cases secondary methods should be used to ensure death



# Families of Killing Methods



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## Functional Disruption of CNS

**Electrocution  
Poisoning**

**The function of the CNS is disrupted to a point where awareness is no longer possible**

**This disruption may be chemical as in the case of poisons or electrical as in the case of electrical stunning**

**In some cases secondary methods should be used to ensure death**



# Families of Killing Methods



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## Deprivation of CNS

Asphyxia

Exsanguination

The CNS is deprived of a substance essential for its function

Loss of awareness is usually due to failure of the cells to continue to produce ATP



# Families of Killing Methods



ANIMAL WELFARE AOTEAROA

## Physical Destruction of CNS

**Shooting**  
**Captive Bolt**  
**Blunt Force Trauma**

## Functional Disruption of CNS

**Electrocution**  
**Poisoning**

**Usually Instantaneous**

## Deprivation of CNS

**Asphyxia**  
**Exsanguination**



# Families of Killing Methods



ANIMAL WELFARE AOTEAROA

## Physical Destruction of CNS

Shooting

Captive Bolt

**Blunt Force Trauma**

## Functional Disruption of CNS

**Electrocution**

Poisoning

**Secondary Method  
Required**

## Deprivation of CNS

Asphyxia

Exsanguination



# AVMA Guidelines for the Euthanasia of Animals: 2013 Edition



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## Members of the Panel on Euthanasia

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