Benessere e cura dei grandi animali impiegati in progetti scientifici” 26 aprile 2021

Segni clinici di malessere e interventi terapeutici

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Utilizzo dei grandi animali per la ricerca

- ricerca di base
- ricerca traslazione
- chirurgia sperimentale
- trial clinici

Utilizzo dei grandi animali per la ricerca

- suini: patologie cardiache, chirurgia sperimentale, enteropatie, coagulopatie, modelli di ischemia cardiaca, test farmacologici, patologie della pelle; circa 70000 suini ogni anno in Europa

- ovini e caprini: chirurgia sperimentale, modelli di rigenerazione ossea, modelli di osetoartrite, trial clinici

- bovini: modelli per cuore artificiale (CARMAT), coagulopatie, trapianti, trial clinici, produzione di siero bovino fetale (non sottoposto a legislazione), trial clinici

- equini: trial clinici per la specie equina

Come identificare i segni clinici di dolore e stress

- i segni clinici sono specie-specifici
- necessità di conoscere l'etologia della specie
- necessità di valutare gli animali prima dello stimolo nocicettivo
- monitorare le modificazioni nel tempo

Come identificare i segni clinici di dolore e stress

- alterazione del comportamento interattivo
- alterazione del comportamento abituale
- riduzione dell’appetito/defecazione
- riduzione/alterazione del movimento
- riduzione della toelettatura
- riduzione dell’attività ludica

Perché è necessario controllare il dolore?

- **Dovere etico e morale**
- **Buon fine della sperimentazione**

1) ridurre morbilità e mortalità

2) migliorare interazione con gli animali

Progettazione del protocollo

- previsione del grado di dolore
- identificazione del dolore
- valutazione del grado di dolore
- progettazione del tipo di intervento
- ri-valutazione dell'efficacia dell'intervento
- HEP (human end point): deciso al momento della progettazione

Osservazioni cliniche

Appendice I

Glossario delle osservazioni cliniche

L'adeguatezza di qualsiasi piano di valutazione della gravità dipende dalla selezione di indicatori di benessere che:

- siano riconoscibili in modo immediato e affidabile;
- siano efficaci nel fornire misurazioni adeguate del benessere;
- siano pertinenti in relazione allo studio scientifico, alla specie e alla razza (se del caso);
- siano agevoli da applicare e non arrechino eccessivo disturbo per l'animale;
- si prestino a misurazioni, interpretazioni e analisi coerenti.

L'adozione di un approccio condiviso alla registrazione delle osservazioni cliniche è quindi un obiettivo auspicabile in quanto contribuisce alla formulazione di approcci coerenti alla classificazione della gravità. Ciò può consentire un più agevole confronto dei risultati clinici ottenuti nei vari studi e l'informazione dei soggetti coinvolti nella valutazione della gravità.

Macro-categorie	Aspetti sui quali concentrare l'attenzione nell'osservazione degli animali	Indicatori specifici da monitorare
Aspetto	**Condizione fisica**	Aumento/ calo ponderale
		Obesità
		Magrezza
		Punteggio di valutazione della condizione fisica, se disponibile
	Stato del mantello e della cute	Piloerezione
		Mantello arruffato/ assenza di *grooming* (cura di sé)
		Mantello untuoso
		Alopecia/perdita di pelo
		Disidratazione: perdita di elasticità e turgore della cute (*skin tenting*)
		Lesioni della cute: tumefazione; crosta; ulcerazione; lesione/ferita
		Tracce di feci o di urina
	Scarico	Oculare; nasale; uro-genitale; secrezioni di porfirina in alcune specie, ad esempio il ratto
	Occhi	Infossati o "spenti"
		Chiusi/socchiusi
		Danno/lesione oculare (ad esempio ulcera corneale)
	Bocca	Salivazione
		Malocclusione/denti sporgenti
	Altro	Espressione facciale di dolore: ad es. occhi socchiusi e naso protuberante (*nose bulge*) nei topi
		Costrizione addominale
		Gonfiore di una parte del corpo, ad esempio addome gonfio
Funzioni corporee	**Respirazione**	Respirazione accelerata (tachipnea)
		Respirazione difficoltosa (iperpnea)
		Respirazione molto difficoltosa (dispnea)

		Respirazione con ansimazione o emissione di altri suoni
	Assunzione di cibo/acqua	Aumentata/ridotta
	Temperatura corporea	Ipertermia/ipotermia; misurazioni della temperatura corporea, se disponibili (effettuate ad es. per mezzo di microchip o dispositivi telemetrici, termometri a contatto o senza contatto); colore delle estremità nei roditori
	Sensi	Indebolimento della vista, dell'udito e dell'equilibrio
Ambiente	**Ambiente di stabulazione, ivi compresi lettiere, materiale per i nidi, elementi utilizzati per l'arricchimento ambientale**	Presenza e consistenza delle feci
		Giaciglio bagnato, ad esempio a causa di poliuria
		Presenza di vomito o sangue
		Utilizzo o meno da parte dell'animale degli elementi forniti per l'arricchimento ambientale, ad es. materiale per i nidi, blocchi da rosicchiare
Comportamenti	**Interazione sociale**	Alterazioni del temperamento normale: interazioni apprensive/aggressive con altri animali; ansietà (ad esempio marcate reazioni di fuga, tendenza a nascondersi)
		Isolamento o ritiro dagli altri animali nel gruppo sociale
	Comportamenti indesiderabili	Comportamento ripetitivo/ stereotipie
		Taglio di pelo e vibrisse *(barbering)* nei roditori, tricotillomania
		Aumento dell'aggressività verso gli esseri umani o altri animali
	Postura e mobilità	Postura anormale
		Andatura anormale; claudicazione; mancanza di movimento/letargia/riluttanza a muoversi se stimolato
		Movimenti non coordinati
		Addome retratto; testa reclinata
	Altro	Tremori
		Crisi/convulsioni/spasmi
		Vocalizzazioni; spontanee o evocate *(Nota: alcune specie, ad esempio i roditori, vocalizzano di solito nella gamma ultrasonica e pertanto le vocalizzazioni udibili sono particolarmente preoccupanti. Anche le*

		vocalizzazioni dei conigli sono in genere inaudibili per l'orecchio umano, a meno che l'animale non sia in stato di distress).
Indicatori procedura-specifici	Vengono definiti in base al singolo progetto, ai suoi potenziali effetti avversi e ai relativi indicatori previsti.	In un modello EAE gli indicatori potrebbero essere, ad esempio: coda atonica, debolezza degli arti posteriori, debolezza degli arti anteriori, paralisi, incontinenza urinaria.
Osservazioni libere	Ogni piano di valutazione della gravità dovrebbe comprendere una sezione per registrare qualsiasi osservazione relativa a impatti negativi imprevisti sul benessere degli animali.	

Esempio di scheda di valutazione

Animale n.				
Data	01/06	02/06	03/06	04/06
Aspetto				
Peso corporeo				
Stato del mantello				
Funzioni corporee				
Dispnea e/o tachipnea				
Assunzione di cibo				
Ambiente				
Feci molli o diarrea				
Diarrea con sangue				
Comportamenti				
Manipolazione				
Aggressione				
Locomozione anormale				
Postura anormale				
Riluttanza a muoversi				
Indicatori specifici relativi alla procedura				
Dimensioni tumore				
Ulcerazione del tumore				
Tumore che impedisce il movimento				
Punteggio totale				
Altre osservazioni				

- la scheda di valutazione giornaliera deve essere adeguata all'esperimento in corso e al tipo di modello animale coinvolto

Esempio di scheda di valutazione

Esempi di sistemi di valutazione clinica

Aspetto	**Punteggio**
Peso corporeo	
Calo ponderale 5-10%	1
Calo ponderale 11-15%	2
Calo ponderale 16-20%	3
Calo ponderale 20% +	HEP
Stato del mantello	
Mantello lievemente arruffato	1
Piloerezione lieve	2
Piloerezione marcata	3
Funzioni corporee	
Tachipnea (respirazione accelerata)	1
Dispnea (respirazione difficoltosa)	3
Ambiente	
Feci molli o diarrea	1
Diarrea con sangue	HEP
Comportamento	
Teso e nervoso alla manipolazione	1
Distress marcato alla manipolazione, ad es. tremore, vocalizzazione, aggressività	3
Locomozione	
Locomozione /postura lievemente anormali	1
Locomozione /postura marcatamente anormali	2
Significativi problemi di mobilità /Riluttanza a muoversi	3
Immobilita >24h	HEP

Interventi	**Punteggio totale**
Intensificare la frequenza del monitoraggio; valutare la possibilità di somministrare liquidi/cure supplementari	≥4
Valutare l'andamento con il veterinario	5-15
Punto finale umanitario	≥16

identificazione dei segni di dolore

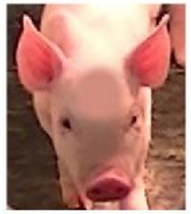
- valutazione generica
- utilizzo di scale specifiche per tipo di dolore e per specie

Segni Clinici Suini

- perdita appetito, ansioso, inattivo
- può reagire alle manipolazioni e urla se toccato nella zona dolente
- perdita del sonno e della preparazione del “letto”
- alterazioni della postura e della camminata

Grimace pain scale

Ear Position


Absent (0)


Moderately present (1)


Obviously present (2)

When the animal is in pain, the ears are drawn back from forward (baseline) position

Cheek Tightening/Nose Bulge


Absent (0)


Moderately present (1)


Obviously present (2)

When the animal is in pain, a bulge of skin is apparent on the snout in response to cheek tightening

Orbital Tightening


Absent (0)


Present (1)

When the animal is in pain, the orbital area is narrowed as the eyelids are squeezed together (scored on a two-point scale)

scale del dolore composite

RESEARCH ARTICLE

Validation of the UNESP-Botucatu pig composite acute pain scale (UPAPS)

Stelio Pacca Loureiro Luna[1☯*], Ana Lucélia de Araújo[2☯¤a], Pedro Isidro da Nóbrega Neto[3‡], Juliana Tabarelli Brondani[1¤b‡], Flávia Augusta de Oliveira[2¤c‡], Liliane Marinho dos Santos Azerêdo[3‡], Felipe Garcia Telles[1‡], Pedro Henrique Esteves Trindade[1‡]

The creation of species-specific valid tools for pain assessment is essential to recognize pain and determine the requirement and efficacy of analgesic treatments. This study aimed to assess behaviour and investigate the validity and reliability of an acute pain scale in pigs undergoing orchiectomy. Forty-five pigs aged 38±3 days were castrated under local anaesthesia. Behaviour was video-recorded 30 minutes before and intermittently up to 24 hours after castration. Edited footage (before surgery, after surgery before and after rescue analgesia, and 24 hours postoperatively) was analysed twice (one month apart) by one observer who was present during video-recording (in-person researcher) and three blinded observers. Statistical analysis was performed using R software and differences were considered significant when $p<0.05$. Intra and inter-observer agreement, based on intra-class correlation coefficient, was good or very good between most observers (>0.60), except between observers 1 and 3 (moderate agreement 0.57). The scale was unidimensional according to principal component analysis. The scale showed acceptable item-total Spearman correlation, excellent predictive and concurrent criterion validity (Spearman correlation ≥ 0.85 between the proposed scale *versus* visual analogue, numerical rating, and simple descriptive scales), internal consistency (Cronbach's α coefficient >0.80 for all items), responsiveness (the pain scores of all items of the scale increased after castration and decreased after intervention analgesia according to Friedman test), and specificity (> 95%). Sensitivity was good or excellent for most of the items. The optimal cut-off point for rescue analgesia was $\geq$ 6 of 18. Discriminatory ability was excellent for all observers according to the area under the curve (>0.95). The proposed scale is a reliable and valid instrument and may be used

Table 3. The UNESP-Botucatu composite pain scale for assessing postoperative pain in pigs.

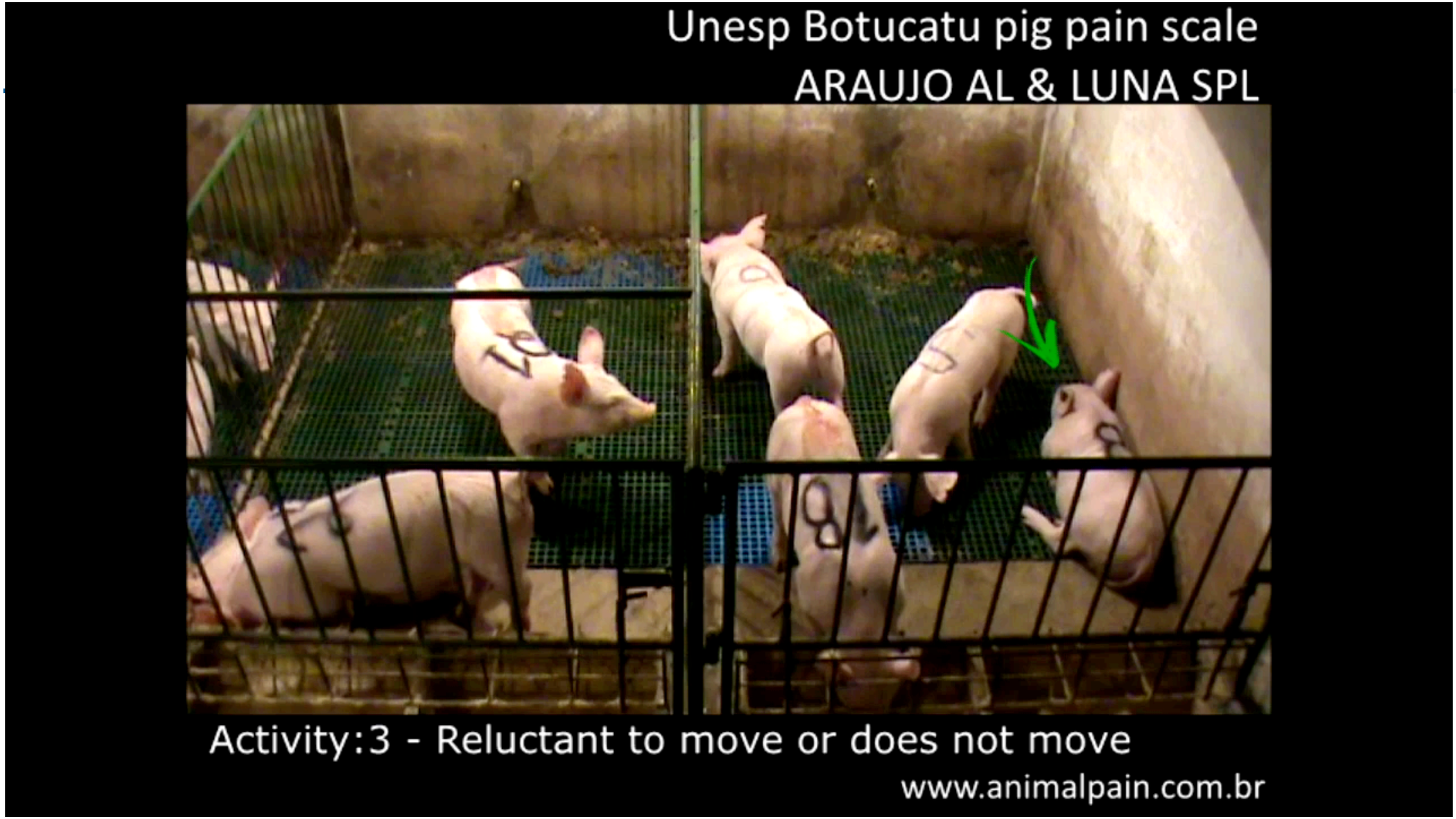
Item	Score/criterion	Links to videos
Posture	(0) normal (any position, apparent comfort, relaxed muscles)	https://youtu.be/-loODGUwmS0
	(1) changes posture, with discomfort	https://youtu.be/V5zEiuJnF_g
	(2) changes posture, with discomfort, and protects the affected area	https://youtu.be/PAZplCKxuhk
	(3) quiet, tense, and back arched	https://youtu.be/qubgsQeoQ-8
Interaction and interest in the surroundings	(0) interacts with other animals; interested in the surroundings	https://youtu.be/OwbrMRogO-I
	(1) only interacts if stimulated by other animals; interested in the surroundings.	https://youtu.be/IPdIeVaeDlY
	(2) occasionally moves away from the other animals, but accepts approaches; shows little interest in the surroundings	https://youtu.be/kQ0gZ4CF5Zk
	(3) moves or runs away from other animals and does not allow approaches; disinterested in the surroundings	https://youtu.be/ZrHZZlLk7Q4
Activity	(0) moves normally	https://youtu.be/3_Rt3MT1pHE
	(1) moves with less frequency	https://youtu.be/lJDfz7KqApY
	(2) moves constantly, restless	https://youtu.be/cfET4CN4g0w
	(3) reluctant to move or does not move	https://youtu.be/X7_uDln8ih0b

Unesp Botucatu pig pain scale

ARAUJO AL & LUNA SPL

Interaction:3 - Moves or runs away from other animals;
does not allow approaches;
disinterested in the surroundings

www.animalpain.com.br


Unesp Botucatu pig pain scale
ARAUJO AL & LUNA SPL
Activity:3 - Reluctant to move or does not move
www.animalpain.com.br

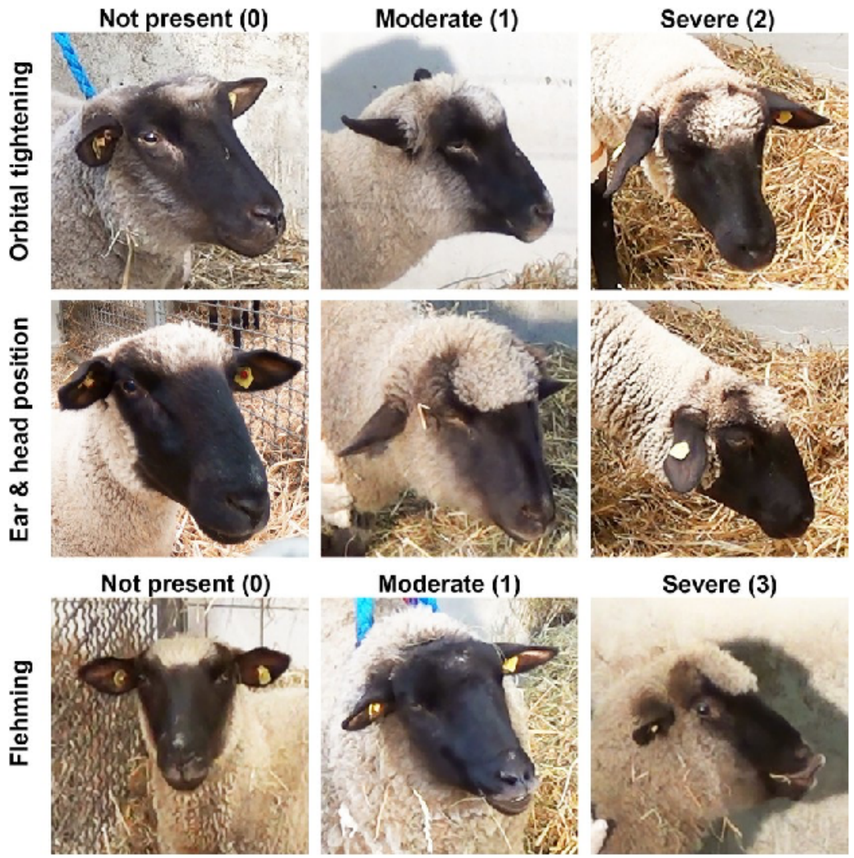
Appetite	(0) normorexia	https://youtu.be/HWymAEgtaO4
	(1) hyperexia	https://youtu.be/QJ4z-TqDnjw
	(2) hyporexia	https://youtu.be/SNgFH5Yt-1A
	(3) anorexia	https://youtu.be/pYWA1VwSHYo
Attention to the affected area	A. elevates pelvic limb or alternates the support of the pelvic limb	https://youtu.be/ndrx0h_nc-Y
	B. scratches or rubs the painful area	https://youtu.be/qVkDWKdTjEk
	C. moves and/or runs away and/or jumps after injury of the affected area	https://youtu.be/RV0c3bIFfdc
	D. sits with difficulty	https://youtu.be/Qq0e1CbRQYU
	(0) all the above behaviours are absent	
	(1) presence of one of the above behaviours	
	(2) presence of two of the above behaviours	
	(3) presence of three or all the above behaviours	
Miscellaneous behaviours	A. wags tail continuously and intensely	https://youtu.be/cfrD0bN5BK4
	B. bites the bars or objects	https://youtu.be/xyw9O14h9dg
	C. the head is below the line of the spinal column.	https://youtu.be/qKQRqY0hCY4
	D. presents difficulty in overcoming obstacles (example: other animal)	https://youtu.be/6ucHv8245N4
	(0) all the above behaviours are absent	
	(1) presence of one of the above behaviours	
	(2) presence of two of the above behaviours	
	(3) presence of three or all the above behaviours	

Complete play list: https://www.youtube.com/watch?v=-loODGUwmS0&list=PLTDt73d-ilJMHnzJdkzlA8h8Fl2iMeTSR

Segni Clinici Ovini e Caprini

- perdita appetito, cessazione della ruminazione
- aumento del movimento, dello stato di ansia
- digrignano i denti, cambiamenti frequenti della postura e appaiono agitate
- inarcamento schiena, estensione del collo
- vocalizzazioni

Segni Clinici Ovini e Caprini



scala composita pecora

Validation of the Unesp-Botucatu composite scale to assess acute postoperative abdominal pain in sheep (USAPS)

Nuno Emanuel Oliveira Figueiredo Silva[1☯], Pedro Henrique Esteves Trindade[1☯], Alice Rodrigues Oliveira[1‡], Marilda Onghero Taffarel[2‡], Maria Alice Pires Moreira[3‡], Renan Denadai[1‡], Paula Barreto Rocha[1‡], Stelio Pacca Loureiro Luna[1☯*]

A scale with robust statistical validation is essential to diagnose pain and improve decision making for analgesia. This blind, randomised, prospective and opportunist study aimed to develop an ethogram to evaluate behaviour and validate a scale to assess acute ovine post-operative pain. Elective laparoscopy was performed in 48 healthy sheep, filmed at one pre-operative and three postoperative moments, before and after rescue analgesia and 24 hours after. The videos were randomised and assessed twice by four evaluators, with a one-month interval between evaluations. Statistical analysis was performed using R software and differences were considered significant when $p < 0.05$. Based on the multiple association, a unidimensional scale was adopted. The intra- and inter-observer reliability ranged from moderate to very good (intraclass correlation coefficient ≥ 0.53). The scale presented Spearman correlations > 0.80 with the numerical, simple descriptive, and visual analogue scales, and a correlation of 0.48 with the facial expression scale. According to the mixed linear model, the scale was responsive, due to the increase and decrease in pain scores of all items after surgery and analgesic intervention, respectively. All items on the scale demonstrated an acceptable Spearman item-total correlation (0.56–0.76), except for appetite (0.25). The internal consistency was excellent (Cronbach's $\alpha = 0.81$) and all items presented specificity > 0.72 and sensitivity between 0.61–0.90, except for appetite. According to the Youden index, the cut-off point was ≥ 4 out of 12, with a diagnostic uncertainty zone of 4 to 5. The area under the curve > 0.95 demonstrated the excellent discriminatory capacity of the instrument. In conclusion, the Unesp-Botucatu pain scale in sheep submitted to laparoscopy is valid, reliable, specific, sensitive, with excellent internal consistency, accuracy, discriminatory capacity, and a defined cut-off point.

Table 3. Final validated Unesp-Botucatu sheep acute composite pain scale (USAPS).

Item	Subitem (descriptors)	Score	Links to videos
Interaction	Active, attentive to the environment, interacts and/or follows other animals	0	https://www.youtube.com/watch?v=4fOJWD-uNbg&t=9s
	Apathetic: may remain close to other animals, but interacts little	1	https://www.youtube.com/watch?v=EEyMC_VIMpk
	Very apathetic: isolated or not interacting with other animals, not interested in the environment	2	https://www.youtube.com/watch?v=5NsthhKoEP4
Locomotion	Moves about freely, without altered locomotion; when stopped, the pelvic limbs are parallel to the thoracic limbs	0	https://www.youtube.com/watch?v=W0Hw2Ibqbyk
	Moves about with restriction and/or short steps and/or pauses and/or lameness; when stopped, the thoracic or pelvic limbs may be more open and further back than normal	1	https://www.youtube.com/watch?v=i8FxBj-yQhw
	Difficulty and/or reluctant to get up and/or not moving and/or walking abnormally and/or limping; may lean against a surface	2	https://www.youtube.com/watch?v=dPdT9VMJTi0
Head Position	Head above the withers or eating	0	https://www.youtube.com/watch?v=W8mi15I1dr8
	Head at the height of the withers	1	https://www.youtube.com/watch?v=8xSUmoXaiZY
	Head below the withers (except when eating)	2	https://www.youtube.com/watch?v=YRxpWSTsqpw
Posture	Arched back		https://www.youtube.com/watch?v=gloa-38gTW8
	Extends the head and neck		https://www.youtube.com/watch?v=rNh_aFePKAE
	Lying down with head resting on the ground or close to the ground		https://www.youtube.com/watch?v=LT6BJzhZO9E
	Moves the tail quickly (except when breastfeeding) and repeatedly and/or keeps the tail straight (except to defecate/urinate)		https://www.youtube.com/watch?v=91RbQMsa8Mg
	Absence of these behaviours	0	
	Presence of one of the related behaviours	1	
	Presence of two or more of the related behaviours	2	
Activity	Moves normally	0	https://www.youtube.com/watch?v=dDx9FesiA2M
	Restless, moves more than normal or lies down and gets up frequently	1	https://www.youtube.com/watch?v=3MjccV2yV74
	Moves less frequently or only when stimulated using a stick or does not move	2	https://www.youtube.com/watch?v=EvLDBJo93jo
Appetite	Normorexia and/or rumination present	0	https://www.youtube.com/watch?v=no1VeiFglUE
	Hyporexia	1	https://www.youtube.com/watch?v=aIEY1UkqQ-k
	Anorexia	2	https://www.youtube.com/watch?v=YV40N-OHuNI

Complete playlist: https://www.youtube.com/watch?v=4fOJWD-uNbg&list=PLTDt73d-ilJNkqldoGmxqMEwc9WzJN0MF

testa abbassata: punteggio 2

segni postura: schiena inarcata

sengi postura: collo esteso

Segni Clinici Bovini

- perdita appetito, cessazione della ruminazione
- aumento del movimento, dello stato di ansia
- riduzione del movimento
- arti sotto di se
- inarcamento schiena
- vocalizzazioni

de Oliveira *et al. BMC Veterinary Research* 2014, **10**:200
http://www.biomedcentral.com/1746-6148/10/200

BMC Bovini Veterinary Research

RESEARCH ARTICLE Open Access

Validation of the UNESP-Botucatu unidimensional composite pain scale for assessing postoperative pain in cattle

Flávia Augusta de Oliveira[1†], Stelio Pacca Loureiro Luna[2*†], Jackson Barros do Amaral[3], Karoline Alves Rodrigues[2], Aline Cristina Sant'Anna[4], Milena Daolio[2] and Juliana Tabarelli Brondani[2]

Abstract

Background: The recognition and measurement of pain in cattle are important in determining the necessity for and efficacy of analgesic intervention. The aim of this study was to record behaviour and determine the validity and reliability of an instrument to assess acute pain in 40 cattle subjected to orchiectomy after sedation with xylazine and local anaesthesia. The animals were filmed before and after orchiectomy to record behaviour. The pain scale was based on previous studies, on a pilot study and on analysis of the camera footage. Three blinded observers and a local observer assessed the edited films obtained during the preoperative and postoperative periods, before and after rescue analgesia and 24 hours after surgery. Re-evaluation was performed one month after the first analysis. Criterion validity (agreement) and item-total correlation using Spearman's coefficient were employed to refine the scale. Based on factor analysis, a unidimensional scale was adopted.

Results: The internal consistency of the data was excellent after refinement (Cronbach's α coefficient = 0.866). There was a high correlation ($p < 0.001$) between the proposed scale and the visual analogue, simple descriptive and numerical rating scales. The construct validity and responsiveness were confirmed by the increase and decrease in pain scores after surgery and rescue analgesia, respectively ($p < 0.001$). Inter- and intra-observer reliability ranged from moderate to very good. The optimal cut-off point for rescue analgesia was > 4, and analysis of the area under the curve (AUC = 0.963) showed excellent discriminatory ability.

Conclusion: The UNESP-Botucatu unidimensional pain scale for assessing acute postoperative pain in cattle is a valid, reliable and responsive instrument with excellent internal consistency and discriminatory ability. The cut-off point for rescue analgesia provides an additional tool for guiding analgesic therapy.

Keywords: Cattle, Castration, Orchiectomy, Reliability, Responsiveness, Validity

Table 6 UNESP-Botucatu unidimensional pain scale for acute postoperative pain assessment in cattle

Item	Score/Criterion
Locomotion	▪ (0) Walking with no obviously abnormal gait.
	▪ (1) Walking with restriction, may be with hunched back and/or short steps.
	▪ (2) Reluctant to stand up, standing up with difficulty or not walking.
Interactive behaviour	▪ (0) Active; attention to tactile and/or visual and/or audible environmental stimuli; when near other animals, can interact with and/or accompany the group.
	▪ (1) Apathetic: may remain close to other animals, but interacts little when stimulated.
	▪ (2) Apathetic: may be isolated or may not accompany the other animals; does not react to tactile, visual and/or audible environmental stimuli.
Activity	▪ (0) Moves normally.
	▪ (1) Restless, moves more than normal or lies down and stands up with frequency.
	▪ (2) Moves less frequently in the pasture or only when stimulated.
Appetite	▪ (0) Normorexia and/or rumination.
	▪ (1) Hyporexia.
	▪ (2) Anorexia.
Miscellaneous behaviours	▪ Wagging the tail abruptly and repeatedly.
	▪ Licking the surgical wound.
	▪ Moves and arches the back when in standing posture.
	▪ Kicking/foot stamping.
	▪ Hind limbs extended caudally when in standing posture.
	▪ Head below the line of spinal column.
	▪ Lying down in ventral recumbency with full or partial extension of one or both hind limbs.
	▪ Lying down with the head on/close to the ground.
	▪ Extends the neck and body forward when lying in ventral recumbency.
	(0) All of the above described behaviours are absent.
	(1) Presence of 1 of the behaviours described above.
	(2) Presence of 2 or more of the behaviours described above.

Figure 1 Characteristic signs of pain in cattle after orchiectomy. A - Head below the line of spinal column; **B** - Hind limbs extended caudally when in standing posture; **C** - Moves and arches the back when in standing; **D** - Kicking/foot stamping; **E** - Licking the surgical wound; **F** - Lying down in ventral recumbency with full or partial extension of one or both hind limbs.

Locomozione: punteggio 2

Segni Clinici Equini

- perdita appetito
- sudorazione
- movimenti della testa
- lambimento labbra e fianco
- guardarsi il fianco
- raspare, rotolarsi

scale composite equini

TABLE 1: The applied equine CPS adapted from Gleerup and Lindegaard (2016). Each measured item has a simple descriptive scale that is weighted numerically, and the score for each item is combined to obtain the CPS score

Type of measurement	Score 0–4				
	0	1	2	3	4
Pain face	No pain face	Pain face occasionally present	Pain face present	Intense pain face	
Gross pain behaviour	None		Occasional	Often	Continuous
Activity levels	Exploring, attention to surroundings or resting	No movement		Restless	Depressed
Location in stable	At the door	Standing in the middle facing the door	Standing in the middle facing the sides	Standing in the middle facing the back or at the back	
Posture	Normal posture and weightbearing	Foot intermittent off the ground/ occasional weight shift	Pinched/tucked up	Continuously taking foot off ground and trying to replace it	No weightbearing/abnormal weight distribution
Head position	Foraging or high	Level of withers	Below withers		
Attention to area	Does not pay attention to painful area		Brief Attention to painful area		Continuous attention to painful area
Interaction	Looks at observer and moves towards observer	Looks at observer but does not move	Does not look at observer or moves away	Does not move, not reacting/ introverted	
Response to food	Takes food with no hesitation	Takes food with hesitation	Looks at food	No response to food	
Breathing rate (breaths/min)	<20		20+		40+
Heart rate (beats/min)	<40	40–43	44–47	48–52	52+

scale composite equini

RESEARCH ARTICLE Open Access

Refinement and partial validation of the UNESP-Botucatu multidimensional composite pain scale for assessing postoperative pain in horses

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Table 4 Refined acute pain scale in horses submitted to castration after the refinement of the data based on the specificity, relevance and criterion validity

Variable	Criteria	Score
Positioning in the stall	The horse's head is at the outside door	0
	The horse is inside the stall, but looking at the outside door, observing the environment	1
	The horse is eating	0
	The horse is not close to the outside stall door and does not look interested in the environment	2
Locomotion	The horse moves freely alone	0
	The horse does not move, or is reluctant to move	1
	The horse is agitated, restless	2
Locomotion when led by the evaluator	The horse moves freely when led	0
	The horse does not move, or is reluctant to move when led	1
	The horse is agitated, restless	2
Response to palpation of the painful area (approximately 3 cm besides the wound)	No response or change in relation to pre-procedure palpation response of the surgical wound	0
	Mild reaction to palpation of the surgical wound	1
	Violent reaction to palpation of the surgical wound	2

Looking at the flank	The horse does not look at the flank	0
	The horse looks at the flank	1
Kicking at the abdomen	The horse does not kick the abdomen	0
	The horse kicks at the abdomen	1
Lifting hind limbs	No lifting of hind limbs	0
	Lifting hind limbs	1
	Lifting hind limbs and extending the head	2
Head movement	Head straight ahead most of the time	0
	Lateral and/or vertical occasional head movements	1
	Lateral and/or vertical continuous head movements	2
Pawing on the floor (fore limbs)	Quietly standing, no pawing	0
	Pawing	1
Heart rate (compared to initial values)	25-50% increase	1
	>50% increase	2

Colorado State University

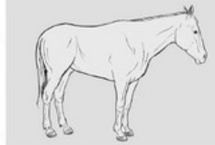
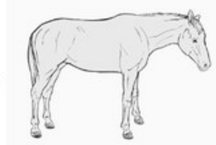
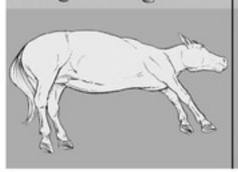
Veterinary Medical Center

Date _____

Time _____

Equine Comfort Assessment Scale

*This scale is designed to be used in the context of the clinical presentation of each animal. If you do not believe the pain scoring criteria to be accurate for this patient, please explain in the comments section below.

Pain Score		Behavior	Clinical Assessment	Postural Features
0		❑ Responds with interest to gate opening, approach by observer ❑ Takes care in movements around people ❑ Head above withers ❑ Attentive ❑ Moving freely, calmly ❑ Resting comfortably	❑ HR: ____ (usually ≤ 40 bpm) ❑ Eyes: relaxed, normally responsive ❑ Normal muscle tension ❑ No focal areas of heat ❑ Palpation not aversive	❑ No lameness perceptible, bears weight equally ❑ Moves with ease of stride
1		❑ Head at or above withers ❑ Facing forward and watching ❑ Performs normal behaviors less frequently than expected ❑ Responds with quiet interest to gate opening, approach by observer ❑ Takes care in movements around people	❑ HR: ____ (may be ≤ 40 bpm) ❑ Mild muscle tension ❑ Mild focal areas of heat ❑ Slightly steps, leans or pulls away from palpation, +/− muscle twitching	❑ Lameness difficult to observe, inconsistently apparent ❑ Mild injury or stiffness in movement
2		❑ Head level with withers ❑ Moving slowly about with bedding undisturbed ❑ Mild but more frequent restlessness ❑ Responds to approach ❑ Less enthusiastic, less interested, less interactive ❑ Less careful about movements around people	❑ HR: ____ (may be ≥ 48 bpm) ❑ Tachypnea +/− RR: ____ ❑ Moderate muscle tension ❑ Increasing areas of heat ❑ Palpation more aversive	❑ Lameness apparent only under certain circumstances, favors leg(s) occasionally ❑ Obvious stiffness in movement
3		❑ Head level or below withers ❑ May face back or corner of stall ❑ More vigorous signs of restlessness ❑ Eyes distracted, far away, weary ❑ Minimally reacts to interaction ❑ Stands in one position ❑ Beginning to become internalized ❑ Less careful about movements around people	❑ HR: ____ (may be ≥ 60 bpm) ❑ Tachypnea +/− RR: ____ ❑ Sweating ❑ Severe muscle tension ❑ Widespread areas of heat ❑ Vigorously aversive response to palpation	❑ Moderate lameness, able to bear weight but clearly favors one or more limbs ❑ Obvious discomfort, weight shifting ❑ Arched back ❑ Very stiff movements ❑ Abnormal standing posture
4		❑ Head often below withers ❑ Stands in corner or faces wall ❑ Ears back, eyes weary ❑ Frequent signs of severe agitation ❑ Extremely uncomfortable, panicky OR ❑ Extremely internalized/withdrawn ❑ Unwilling to rise ❑ Careless about movements around people	❑ HR: ____ (may be ≥ 70 bpm) ❑ Tachypnea +/− RR: ____ ❑ Profuse sweating ❑ Extreme muscle tension/rigidity +/− fasciculation ❑ Widespread areas of heat ❑ Extremely aversive response to palpation, possibly aggressive	❑ Unable or unwilling to bear weight ❑ May not be able to move ❑ Constant shifting of weight ❑ Very abnormal standing posture OR ❑ In sternal or lateral recumbency

Current Pain Treatment(s):

Comments: _____

A

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Equine Comfort Assessment Scale

List of Behavioral Descriptors

General

- Pawing
- Stamping
- Tail switching without insects or other stimulus
- Circling in stall
- Flaring nostrils frequently
- Frequent head shaking without obvious reason
- Repetitive behaviors: Examples can include rubbing, pacing
- Getting up and laying down frequently
- Rocking to and fro on limbs
- Grunting
- Difficult to get settled down

Musculoskeletal-specific

- Frequent weight shifting
- Rocking to and fro on limbs
- Stamping
- "Grimacing" (associated with laminitis)

Abdomen-specific

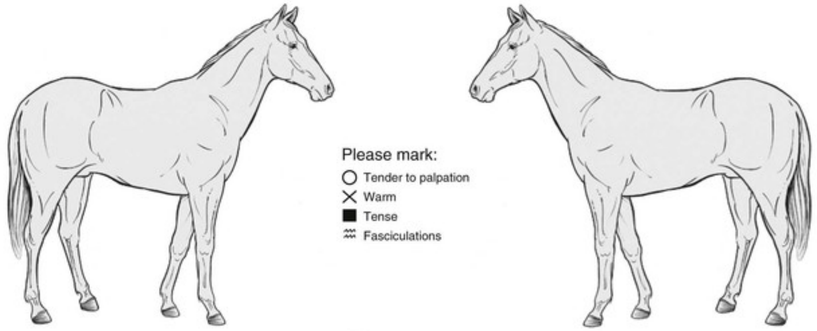
- Pawing
- Flank watching
- Flank biting
- Teeth grinding
- Kicking at abdomen
- Rolling on ground
- Grunting
- Thrashing

Palpation Reactions

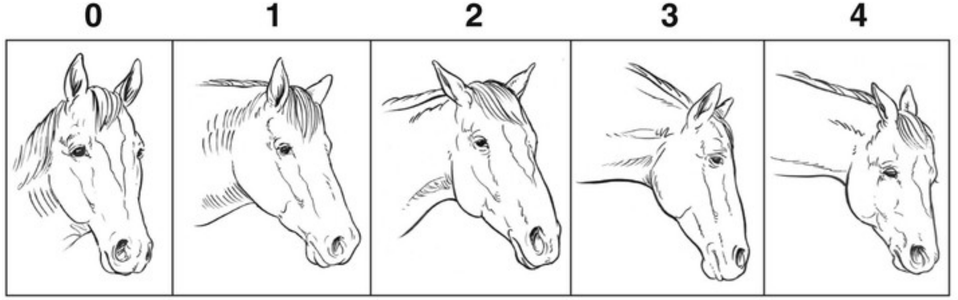
Aversive reaction to palpation may manifest as:

- Splinting
- Muscle twitching
- Hyperalgesia/Allodynia
- Biting
- Striking
- Kicking

Location of Palpation Abnormalities

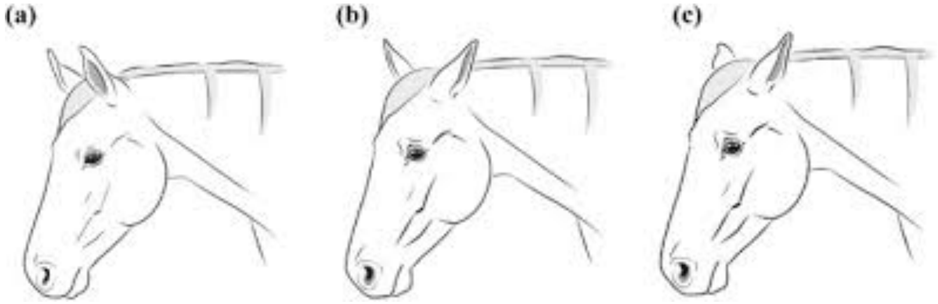


Facial Expressions



B

grimace scale



Orbital tightening

Not present (0)

Moderately present (1)

Obviously present (2)

Tension above the eye area

Not present (0)

Moderately present (1)

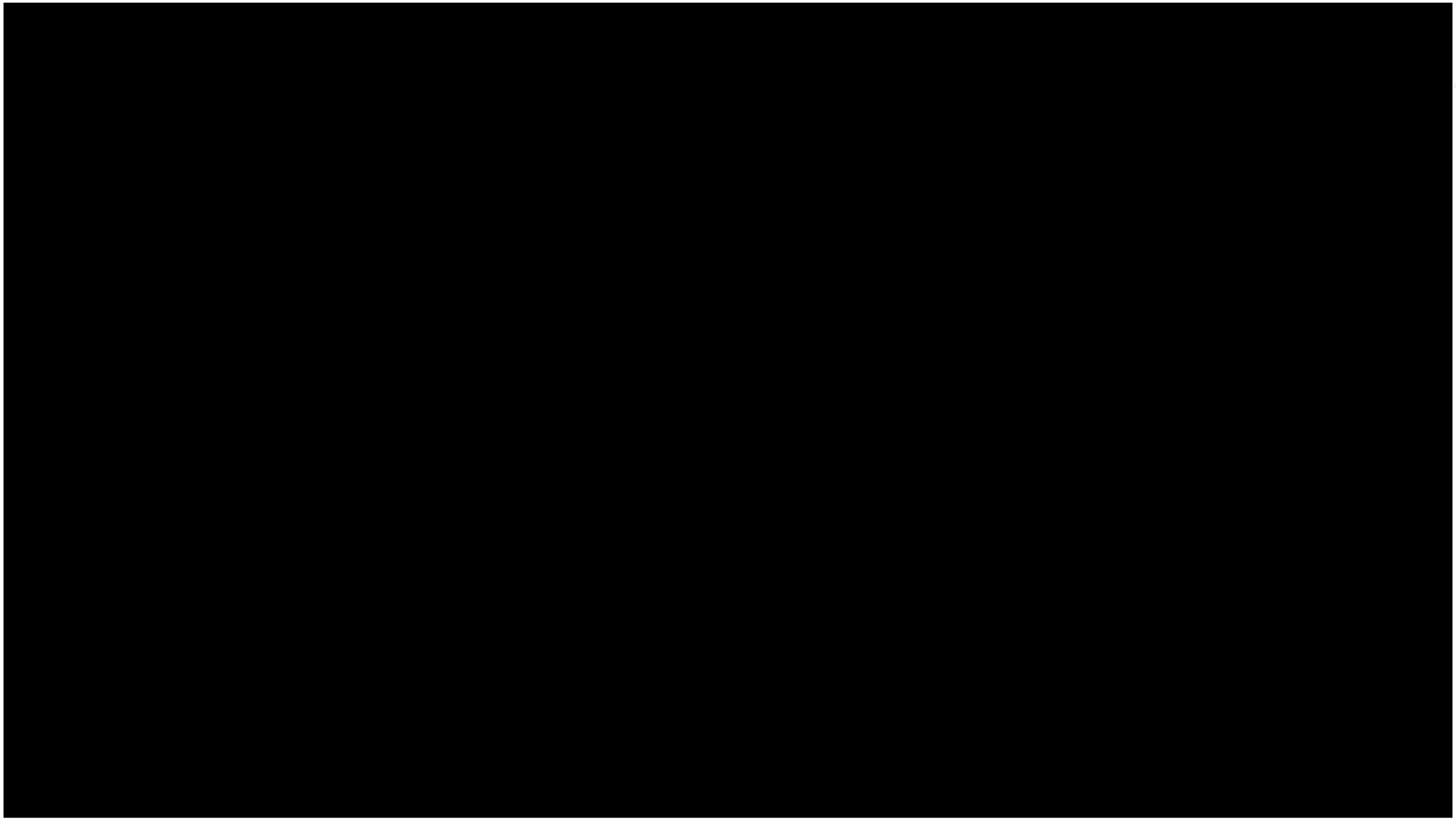
Obviously present (2)

Strained nostrils and flattening of the profile

Not present (0)

Moderately present (1)

Obviously present (2)



- Grazie per l’attenzione