

## How do pigs feel pain?



Dr. Doris Timmann, DVM  
Agerskov (DK), 24th January 2024

*Because we care*

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### Agenda

- ♥ What is pain?
- ♥ Where does pain live?
- ♥ What are the consequences of pain?
- ♥ How can we recognize pain?
- ♥ What can we do tomorrow?

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## What is pain?

International Association for the Study of Pain - IASP



„An unpleasant **sensory and emotional** experience associated with, or resembling that associated with, **actual or potential** tissue damage.“

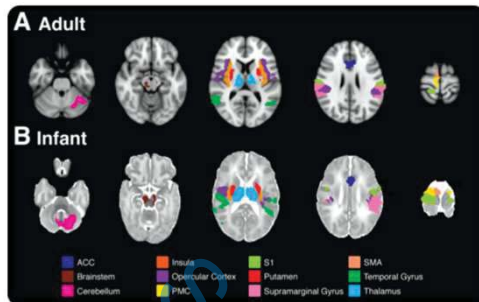
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## What is pain?



Self report



### MRI used to study infant pain

- 18 of 20 brain 'pain' regions activate in adults are also active in babies
- suggests infants **are more sensitive** to pain than adults
- highlights need to review pain relief for babies

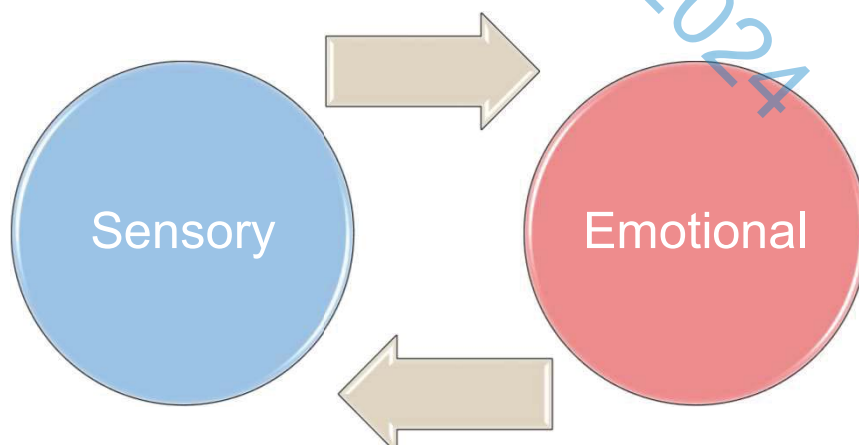
Sezgi Goksan, Caroline Hartley, Faith Emery, Naomi Cockrill, Ravi Poorun, Fiona Moultrie, Richard Rogers, Jon Campbell, Michael Sanders, Eleri Adams, Stuart Clare, Mark Jenkinson, Irene Tracey, Rebecca Slater (2015) fMRI reveals neural activity overlap between adult and infant pain eLife 4:e06356 <https://doi.org/10.7554/eLife.06356>



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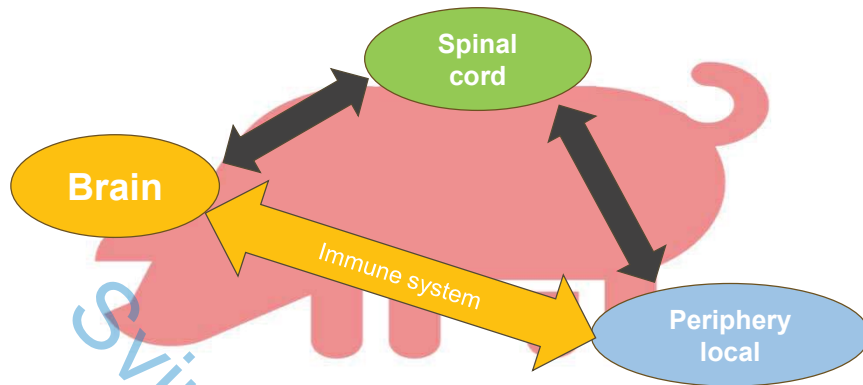
## What is pain?



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## What is pain?

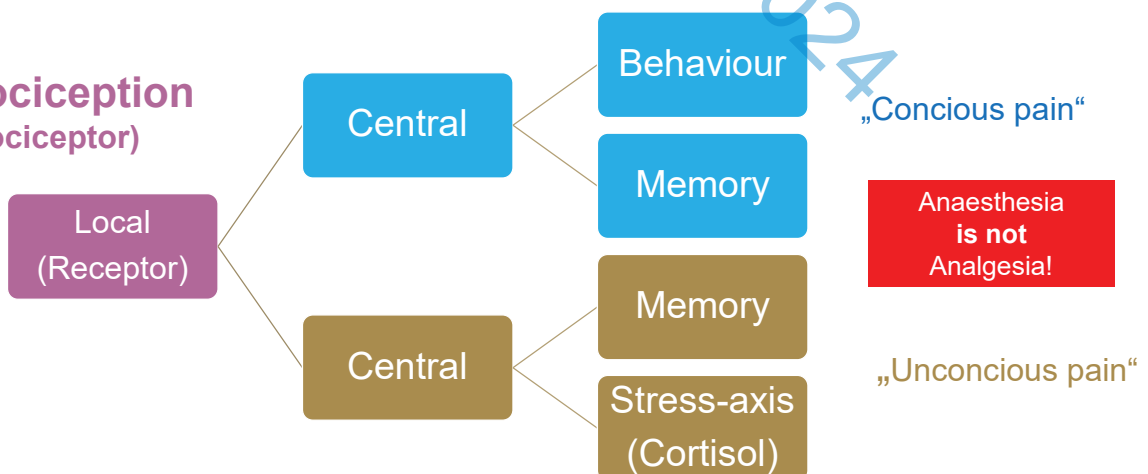


**Multimodal therapy!**

## What is pain?



### Nociception (Nociceptor)



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## Where does pain live?

Limbic system and amygdala



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Adobe stock

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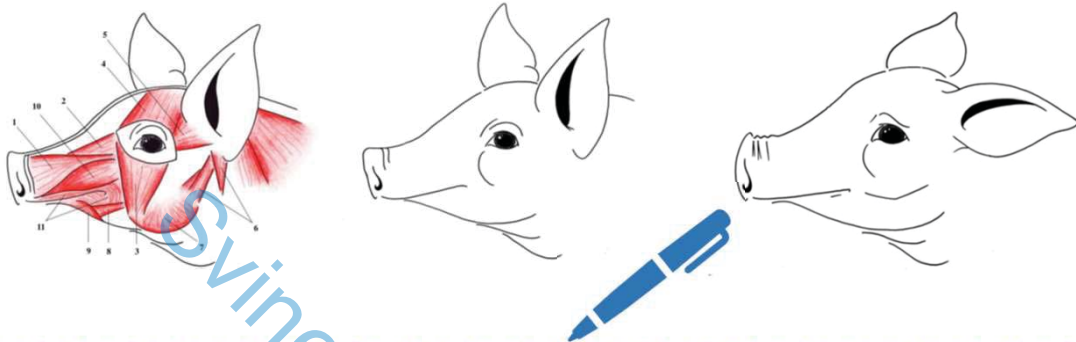
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## Where does pain live?



Göransson (2016): **Porcine pain face** – identifying visible characteristics of pain in pigs



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## Where does pain live?



Piglet Grimace

Source:

<https://youtu.be/XnOMYZ3-ZC4>

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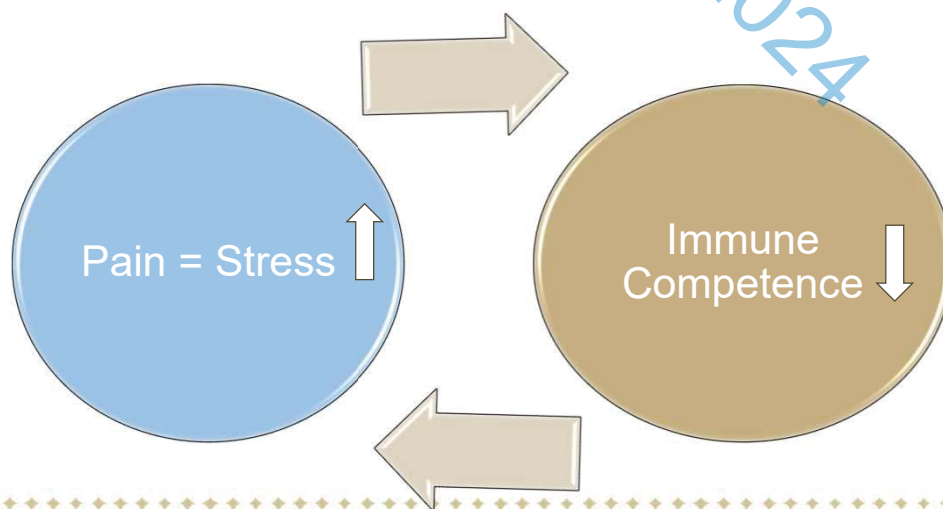
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## What are the consequences of pain?



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## What are the consequences of pain?



Immune system: „Sensory organ“ to detect threats

**Acute**

↑ Innate immunity (fast)  
↓ Adaptive Immunity (after days)

**Herd  
management  
!!!**

↓ Cellular Immunity (T-cells)  
↑ Humoral Immunity (Antibody)

**Chronic**

↓ Innate immunity  
↓ Cellular immunity  
↓ Humoral immunity

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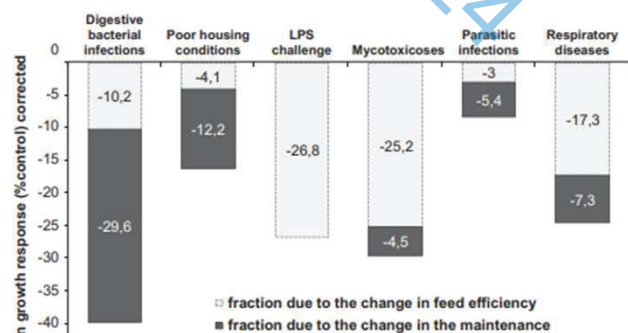
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## What are the consequences of pain?



Pastorelli H, van Milgen J, Lovatto P, Montagne L. Meta-analysis of feed intake and growth responses of growing pigs after a sanitary challenge. *Animal*. 2012 Jun;6(6):952-61. doi: 10.1017/S175173111100228X. PMID: 22558966.

**„Sickness  
behaviour“**



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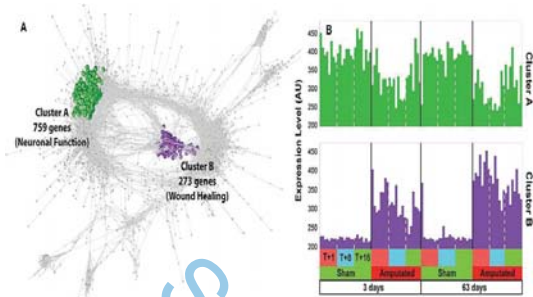
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## What are the consequences of pain?



Long term



1. Tail amputation
2. Caused sustained transcriptomic expression changes
3. Cells involved in **inflammatory** and **neuropathic pain** pathways

Sandercock DA, Barnett MW, Coe JE, Downing AC, Nirmal AJ, Di Giminiani P, Edwards SA and Freeman TC (2019) Transcriptomics Analysis of Porcine Caudal Dorsal Root Ganglia in Tail Amputated Pigs Shows Long-Term Effects on Many Pain-Associated Genes. *Front. Vet. Sci.* 6:314. doi: 10.3389/fvets.2019.00314



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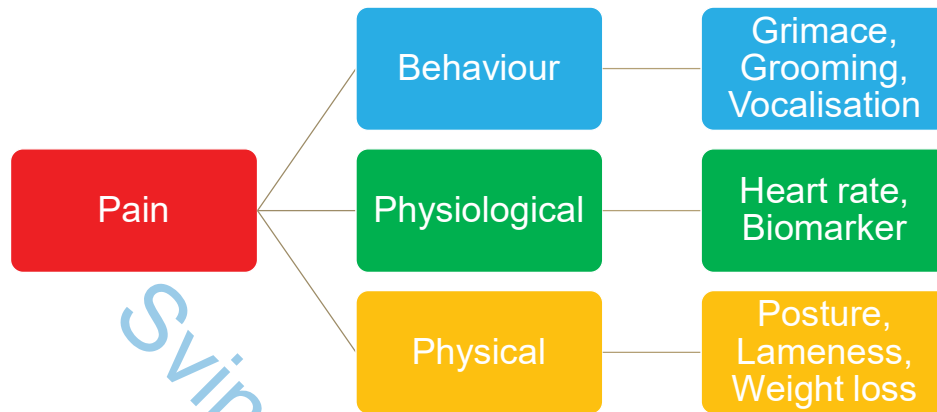


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## How can we recognize pain ?



Pain scoring in practice



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## UPAPS: Pig Composite Acute Pain Scale



UNESP- Botucatu

Robles I, Luna SPL, Trindade PHE, Lopez-Soriano M, Merenda VR, Viscardi AV, Tamminga E, Lou ME, Pairs-Garcia MD. **Validation of the Unesp-Botucatu pig composite acute pain scale (UPAPS)** in piglets undergoing castration. PLoS One. 2023 Apr 13;18(4):e0284218. doi: 10.1371/journal.pone.0284218. PMID: 37053294; PMCID: PMC10101451.

Item	Score	Score/criterion	Link to videos
Posture	0	Normal (any position, apparent comfort, relaxed muscles) or sleeping	<a href="https://youtu.be/Q25wC1250M4">https://youtu.be/Q25wC1250M4</a>
	1	Changes posture, with discomfort	<a href="https://youtu.be/SpaWdCFpAE">https://youtu.be/SpaWdCFpAE</a>
	2	Changes posture, with discomfort, and protects the affected area	<a href="https://youtu.be/V5dRrC8YA">https://youtu.be/V5dRrC8YA</a>
	3	Quiet, tense, and back arched	<a href="https://youtu.be/jpm4h3163ao">https://youtu.be/jpm4h3163ao</a>
Interaction and interest in the surroundings	0	Interacts with other animals, interested in the surroundings or sleeping	<a href="https://youtu.be/-86871gq2I">https://youtu.be/-86871gq2I</a>
	1	Only interacts if stimulated by other animals, interested in the surroundings	<a href="https://youtu.be/Xf0dew3dww">https://youtu.be/Xf0dew3dww</a>
	2	Occasionally moves away from the other animals, but accepts approaches, shows little interest in the surroundings	<a href="https://youtu.be/2K2H35U6A6">https://youtu.be/2K2H35U6A6</a>
	3	Moves or runs away from other animals and does not allow approaches, disinterested in the surroundings	<a href="https://youtu.be/5e706YXWDe">https://youtu.be/5e706YXWDe</a>
Activity	0	Moves normally or sleeping	<a href="https://youtu.be/c755715-XA">https://youtu.be/c755715-XA</a>
	1	Moves with less frequency	<a href="https://youtu.be/9Z09wq8LA88">https://youtu.be/9Z09wq8LA88</a>
	2	Moves constantly restless	<a href="https://youtu.be/Y28h311yph">https://youtu.be/Y28h311yph</a>
	3	Reluctant to move or does not move	<a href="https://youtu.be/Z205C20p8fo">https://youtu.be/Z205C20p8fo</a>
Attention to the affected area	A	Elevates pelvic limb or alternates the support of the pelvic limb	<a href="https://youtu.be/UD96807H10">https://youtu.be/UD96807H10</a>
	B	Scratches or rubs the painful area	<a href="https://youtu.be/7dYK1harE">https://youtu.be/7dYK1harE</a>
	C	Moves and/or runs away and/or jumps after injury of the affected area	<a href="https://youtu.be/u-Pqpbom278">https://youtu.be/u-Pqpbom278</a>
	D	Sits with difficulty	<a href="https://youtu.be/TNfOCVY4b0">https://youtu.be/TNfOCVY4b0</a>
Miscellaneous behaviors	0	All the above behaviors are absent	
	1	Presence of one of the above behaviors	
	2	Presence of two of the above behaviors	
	3	Presence of three or all the above behaviors	
	A	Wags tail continuously and intensely	<a href="https://youtu.be/pU5dGZ9NBHc">https://youtu.be/pU5dGZ9NBHc</a>
	B	Bites the bars or objects	<a href="https://youtu.be/c73d9p3Mk">https://youtu.be/c73d9p3Mk</a>
	C	The head is below the line of the spinal column	<a href="https://youtu.be/Z24gqg10pI">https://youtu.be/Z24gqg10pI</a>
	D	Presents difficulty in overcoming obstacles (example: another animal)	<a href="https://youtu.be/9Bd303GacT">https://youtu.be/9Bd303GacT</a>
	0	All the above behaviors are absent	
	1	Presence of one of the above behaviors	
	2	Presence of two of the above behaviors	
	3	Presence of three or all the above behaviors	

Table 4. Unesp-Botucatu Pig Composite Pain Scale system without appetite or nursing item<sup>18,19</sup>.

[Posture](#)

[Interaction and interest in surroundings](#)

[Activity](#)

[Attention in affected area](#)

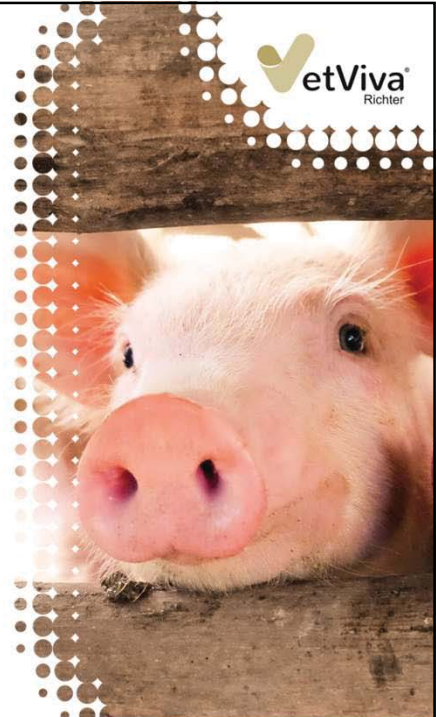
[Miscellaneous behaviours](#)

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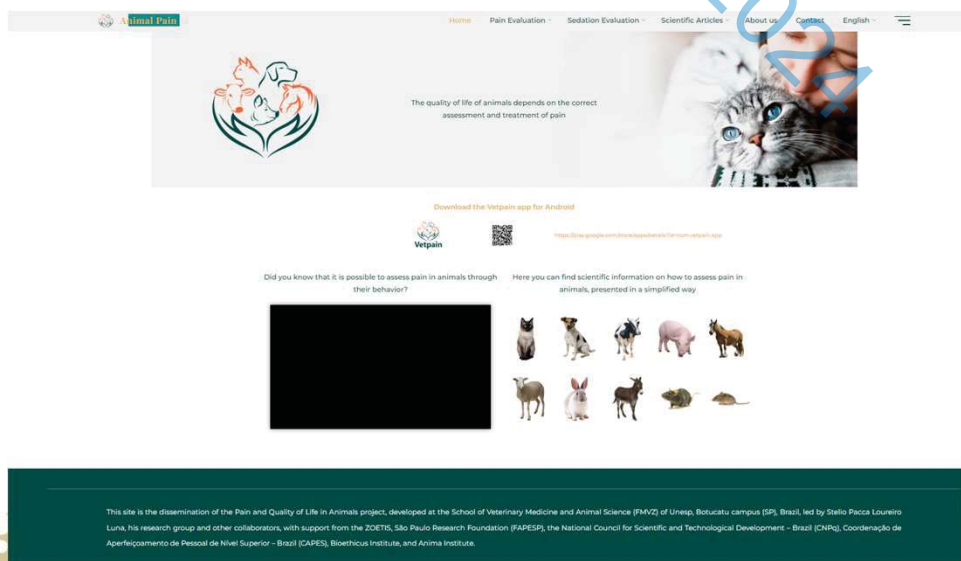


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[www.animalpain.org](http://www.animalpain.org)

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PAIN ASSESSMENT IN PIGS

Unesp-Botucatu Composite Scale for pain assessment in pigs (UPAPS - Unesp-Botucatu Pig Acute Pain Scale)

1. CHARACTERISTICS OF THE SCALE

2. HOW DO YOU EVALUATE EACH CHARACTERISTIC OF THE ANIMAL?

3. UNESP-BOTUCATU COMPOSITE SCALE TO ASSESS ACUTE PAIN IN PIGS (UPAPS)

Unesp-Botucatu Composite Scale to assess acute pain in pigs (UPAPS)

1. Posture	Score	Videos
Normal (any position, apparent comfort, relaxed muscles) or sleeping	0	
Changes posture, with discomfort	1	
Changes posture, with discomfort, and protects the affected area	2	
Quiet, tense, and back arched	3	

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Fit for pigs

[www.fitforpigs.de](http://www.fitforpigs.de)



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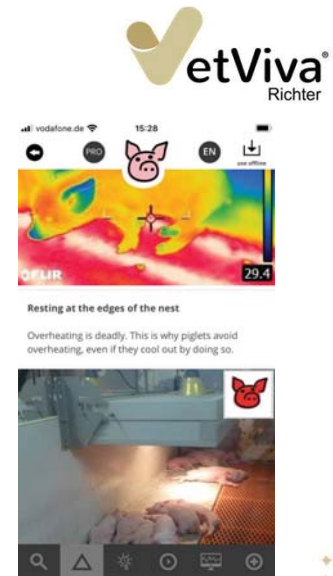
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## App „Fit for pigs“

[www.fitforpigs.de](http://www.fitforpigs.de)



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## AI might help...

Social LEAP:  
Estimates Animal  
Poses (**SLEAP**)

[www.sleap.ai](http://www.sleap.ai)



Pereira, T.D., Tabris, N., Matsliah, A. et al. SLEAP: A deep learning system for multi-animal pose tracking. *Nat Methods* 19, 486–495 (2022). <https://doi.org/10.1038/s41592-022-01426-1>

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**Thank you! 😊**

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SvineVet Årsmøde 2024