PGAD AND THE BRAIN
The Genito-Cerebral (Mental) Pathway

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Two arguments for the central role of the brain

- **BRAIN’S DOMINANCE OVER SENSATION**
  - Without the brain, sensation is meaningless to us
  - Brain activity directly influences changes in other body parts

- **THE CENTRAL ROLE OF DISTRESS**
  - Without distress, there is no diagnosis of PGAD
What the brain does to sensation

- 25 degree rod against neck - Told it’s HOT or COLD


Interpretation of hot and cold (in insular cortex)

- Can our senses reliably distinguish HOT from COLD?

- Does any bias influence the amount of skin damage we expect?

- 86% of those told the bar was cold rated the pain as below the median, 87% of those told it was hot rated it above the median (p<.001)

- Those who were told it was hot rated the potential tissue damage from the rod as significantly higher (p<.01)
Expectation changes sensation
HOW TO FOOL YOUR GUESTS

- RED WINE
- WHITE WINE
- WHITE WINE WITH RED COLOURING
BUT:

- These expectations processed through learning e.g.

- Perhaps these expectations formed in brain don’t affect the body?

- They just affect the head?
Swelling associated with an example of Complex Regional Pain Syndrome (CRPS)

CRPS is
- characterized by burning pain
- increased sensitivity to tactile stimuli,
- sensations of pain in response to normally non-painful stimuli
- (Birklein et al., 2000; Wasner et al., 2003)
Visual distortion of a limb modulates the pain and swelling evoked by Movement  
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Punishment and reward pathways

- Cortical structures are about guiding behaviour

- They help us code sensations as rewarding or punishing, to guide approach or flight

- Learning means that the brain has encoded associations and these associations arise automatically – unlike verbal learning!

- Our experience guides us to see what we have learnt. In extreme forms, lack of experience can prevent us being able to see what we would otherwise see (like Blakemore’s kittens)
Possible explanation

- Associated with cortical somato-sensory changes


- Cortical reorganisation treatment effective in resolving pain


Sources of distress causing discordance e.g. dissociation of arousal and sex

- SUBJECTIVE AROUSAL
- OBJECTIVE GENITAL ENGORGEMENT
A modest prediction

- That women with PGAD are less likely to have experienced genital sensations in the absence of any sexual context than women who do not have PGAD
Can Anxiety, Depression, Distress increase engorgement?

- ANXIETY, DEPRESSION
- CONDITION DISTRESS

PHYSICAL CHANGES
Temperature changes mediated by perceived hand position

<table>
<thead>
<tr>
<th>Condition</th>
<th>Temperature Change</th>
</tr>
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<tbody>
<tr>
<td>If patient thinks it is on other side of body when it isn’t</td>
<td>$\Delta^\circ C=-0.30 \pm 0.15^\circ C$</td>
</tr>
<tr>
<td>If patient thinks it’s an actual transfer</td>
<td>$\Delta^\circ C=+0.28 \pm 0.14^\circ C$</td>
</tr>
<tr>
<td>Patient sees actual midline transfer</td>
<td>$\Delta^\circ C=+0.47 \pm 0.14^\circ C$</td>
</tr>
<tr>
<td>If patient doesn’t know it’s an actual midline transfer</td>
<td>$\Delta^\circ C=+0.07 \pm 0.06^\circ C$</td>
</tr>
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- Temperature down
- Temperature up
- Temperature up
- No sig temp change

So we know that feelings of burning, feelings of damage, but also actual swelling, actual temperature can vary with perception, mediated by cortical structures that link our bodily sensations with our brains particular with insular cortex which is also associated with orgasm Ortigue S, Grafton ST, Bianchi-Demicheli F (August 2007). "Correlation between insula activation and self-reported quality of orgasm in women". Neuroimage 37 (2): 551–60. doi:10.1016/j.neuroimage.2007.05.026.PMID 17601749.

We can also see how these perceptions are affected by expectations of context, such as whether a situation is sexual or not sexual. And that all these may give rise to distress.
And the point? A modest proposal

Convergence of many different aetiologies

PGAD CRPS

Pain/Distress result
Reeducate brain top down (attention training, mindfulness)

Send new feedback to brain (mirrors, photoplethysmograph)

Reduce distress