

Slides of WPA Presentation
Chair – Dr. K R Wylie
Speaker – Dr. A K Singh

2nd April 2009

Workshop - W05

Time - 1600hrs

How do the new models of sexual desire really help patients with mental health problems?

Professor Kevan Wylie MB, MD, DSM, FRCP, FRCPsych

Dr Ashok Singh BSc, MBBS, MSc. (2nd Yr.) Sheffield Hallam
University

WPA Florence 2009

Three Cases

- 52 yr. M, presenting in A&E with Suicidal Intent and Plan – reluctant to talk to psychiatrist – “You will not understand my Problem” – Lack of Sexual Desire
- 26 yr. M, on medical ward with fatal O/D – would like to talk to a psychiatrist - Premature ejaculation
- 29 yr. M, with Bipolar Disorder under care of Assertive outreach team - seen STD clinic for – Did not know whom to talk to - Dry ejaculation and Anorgasmia

Aim of this presentation

- Review of Sexual Response Model
- New concepts of sexual desire -
Biopsychosocial Model?
- Possible factors for loss of sexual desire in
chronic mental illness.
- How to incorporate these models into clinical
practice.

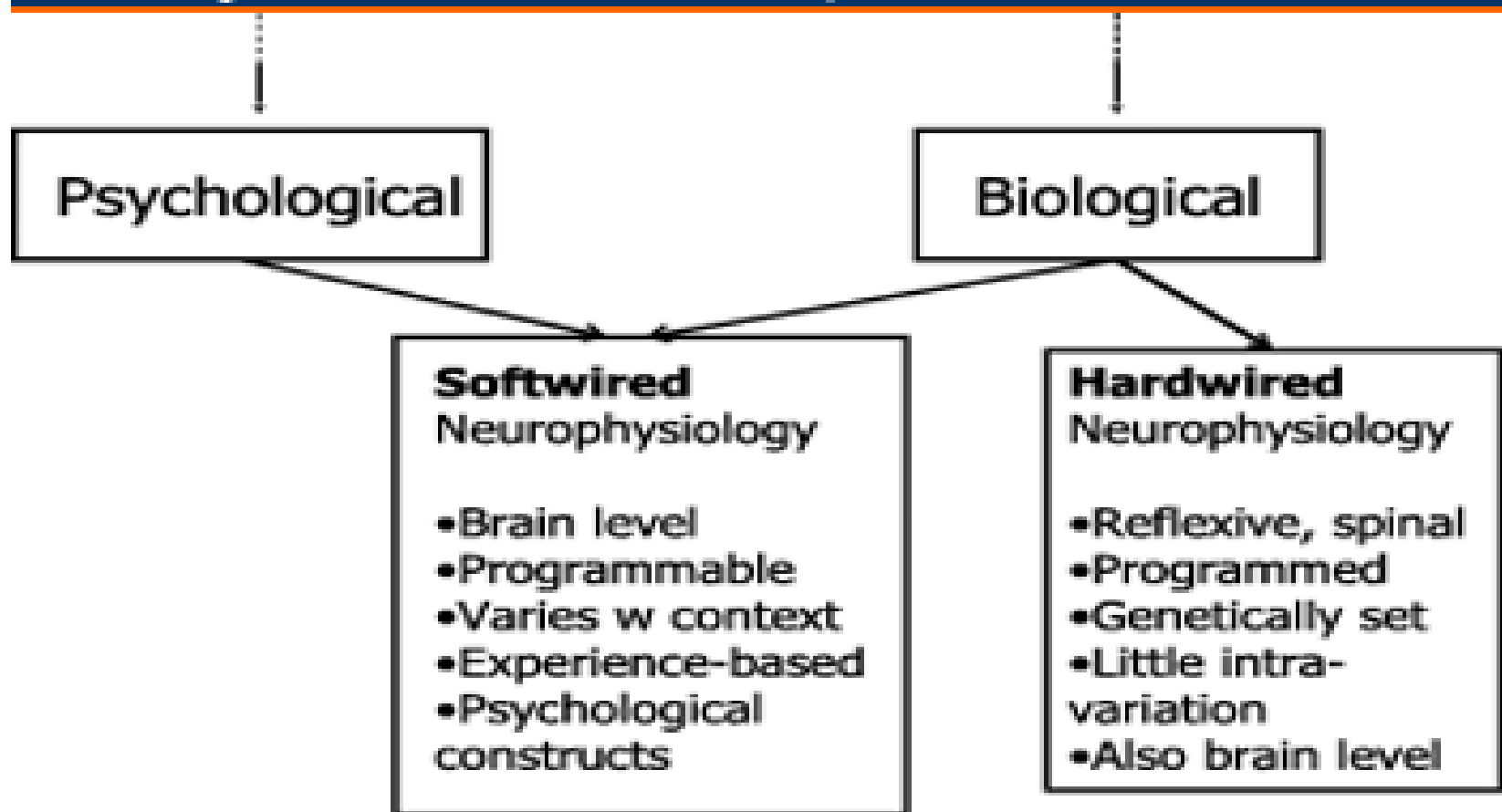
Sexual Response Models

- M&J (1966) – Excitement Plateau Orgasm Resolution
- Kaplan (1979) – Desire Excitement Orgasm Resolution
- Walen & Roth's Model (1987) - Perception (attention, attribution, labelling) > Positive Evaluation > Arousal and Positive Evaluation of Arousal > Sexual Behaviour and Positive Evaluation of Sexual Behaviour
- Whipple and Brass-McGreer (1997) – Seduction (Desire) Sensation Surrender Reflection
- Levin (2000) – D1 D2 (Spontaneous Desire)
- Basson (2001) – Desire for Intimacy, Desire for relationship, Desire for Sex

Sexual Behaviour

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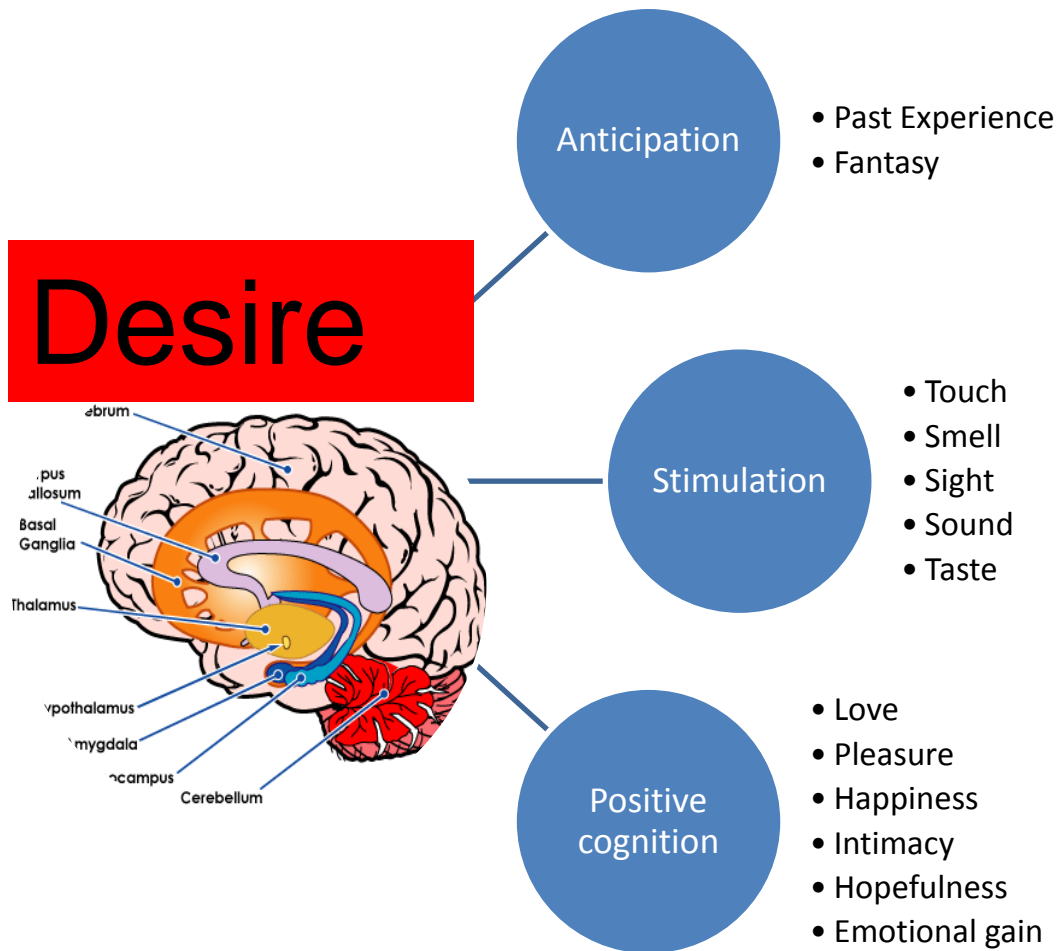


Dimension of Sexual Function/Dysfunction

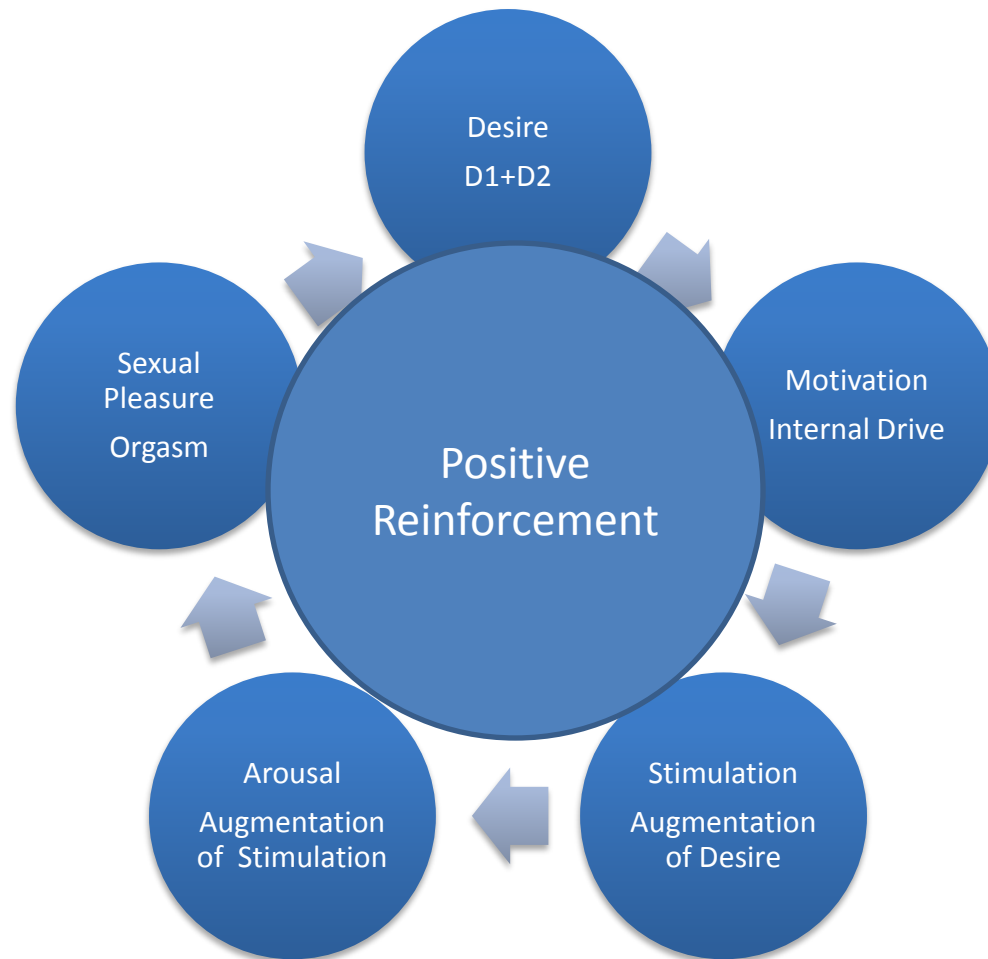
(Althof and Leiblum, International Consultation, 2005)

Predisposing Factor	Genetic makeup, Personality trait, Developmental factors, Social and cultural factors, Sex education and experiences.
Precipitating Factor	Choice of partner, Quality of relationship, Life events, Illness and bereavement, Traumatic experiences, Child birth, Surgery, Menopause.
Maintaining Factor, Contextual Factors	Stressors and coping mechanism, Physical and mental illness, personal financial, and social circumstances, self esteem, body image, family and personal relationship, drug abuse and medication.

Sexual Reward System



Cyclical Effect



Neuroendocrine Factors

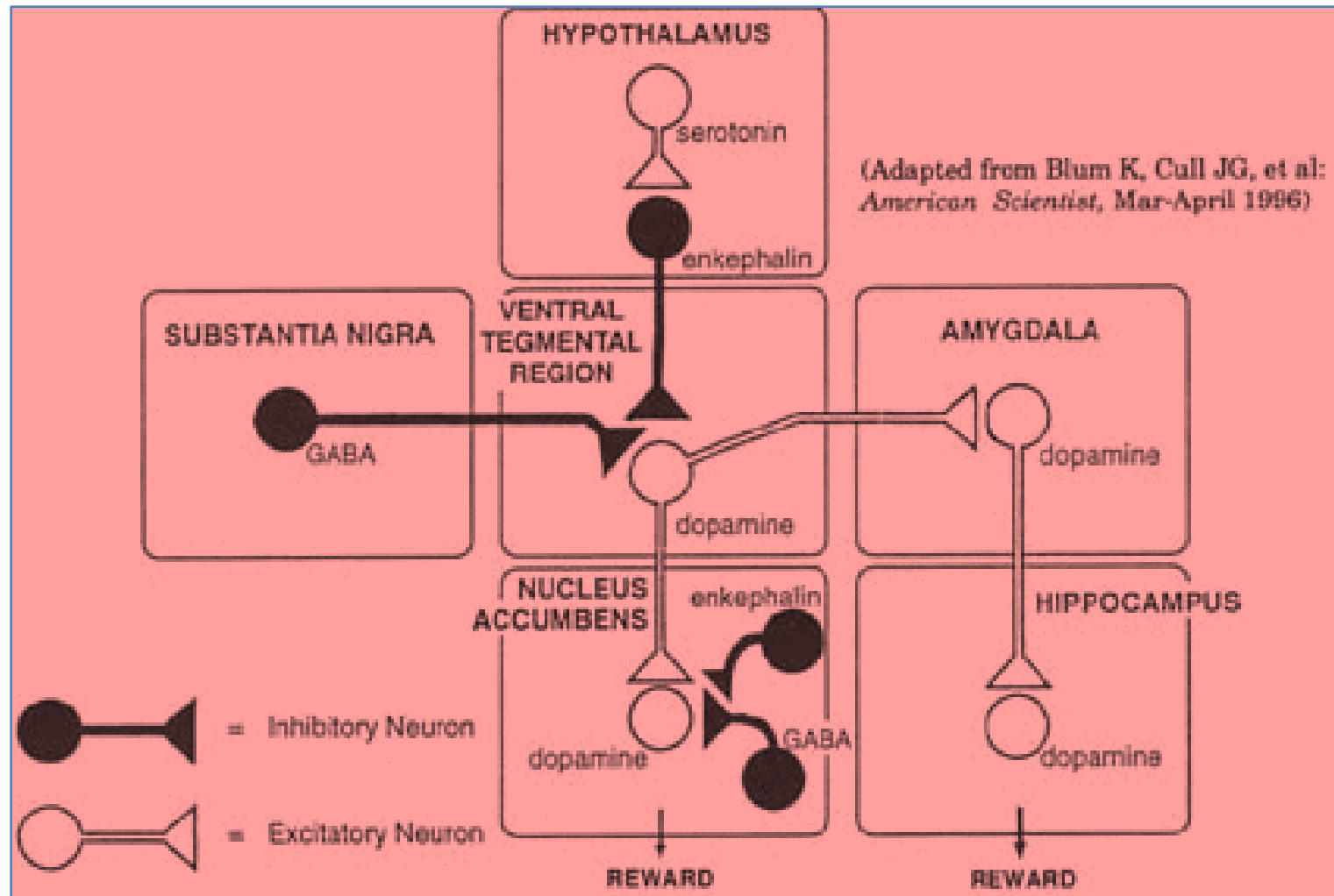
(Scepkowski et al, 2006)

- The neurochemical actions of steroid hormones stimulate sensory awareness, arousal, mood, and reward, and link them to salient features of a partner, place and action.
- Sexual motivation is stimulated, maintained, and terminated by a constellation of neurotransmitter and receptor changes.
- These changes are induced by progestins, androgens, estrogens and sensory feedback, that generates peripheral and central "state" change
- The activation of melanocortin, dopamine and progestin receptors may be key intermediaries in the stimulation of sexual desire, sexual motivation and sexual reward.

Effect of Dopamine

- The origin of the ventral tegmental dopamine system appears to provide an important neurochemical interface where exogenous opiates and endogenous opioid peptides (e.g., endorphins, enkephalins) can activate a brain mechanism involved in appetitive motivation and reward (Bozarth 1994)
- Activation of the Mesolimbic Dopamine Pathway, starts in the Ventral Tegmental Area and ends at the dopamine D2 receptors on the cell membranes of neurons located in the Nucleus Accumbens and the Hippocampus (Volkow, J Neurosciences 2007)

Brain reward cascade





Genetic Factors

- Genetic variations at the level of mesolimbic activity, polymorphisms of the serotonergic-2A receptor, dopamine D2 receptor and catechol-o-methyl-transferase (COMT) genes predispose individuals to excessive cravings and resultant aberrant behaviours.
- In a large survey of the relative frequency of orgasm during intercourse or during masturbation they found a higher correlation among identical twins (31% and 39%, respectively) than among fraternal twins (10% and 17%, respectively) (Dunn, 2005)

Evidence from Drug Treatment

- Aripiprazole - Partial agonist at dopamine D₂receptor, Partial agonist at serotonin 5-HT_{1A}receptor, Antagonist at serotonin 5-HT_{2A}receptor.
- Agomelatine – 5HT2c antagonist enhances activity of frontocortical dopaminergic and adrenergic pathway (Millan et al, 2003)
- Buprapion Treatment (5HT1A agonist) - Attenuation in emotion-induced blood-oxygen-level-dependent (BOLD) activation responses in the amygdala and related brain regions may be associated with a positive clinical response in depression (Robertson et al 2007)

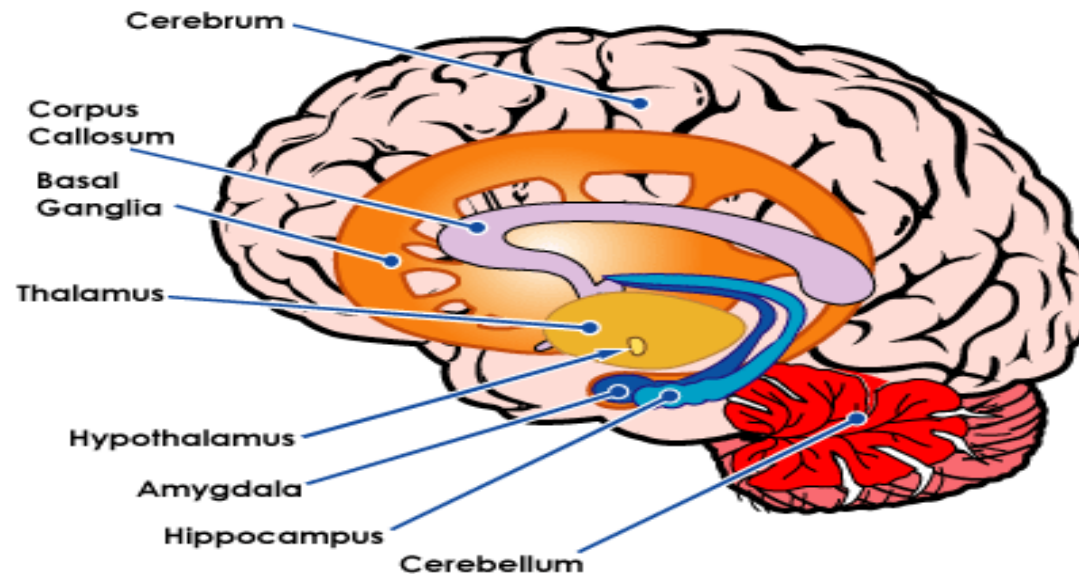
Reward Pathway Function

Genetic science Learning Centre, University of Utah

- The central job - make us feel good when engage in beneficial behaviours include eating, drinking and sex.
- A jolt of pleasure, ensure that we will repeat behaviours which are necessary for survival.
- This is done by connecting to regions of the brain that control memory and behaviour.
- It strengthens the wiring for behaviours that help you achieve your reward.

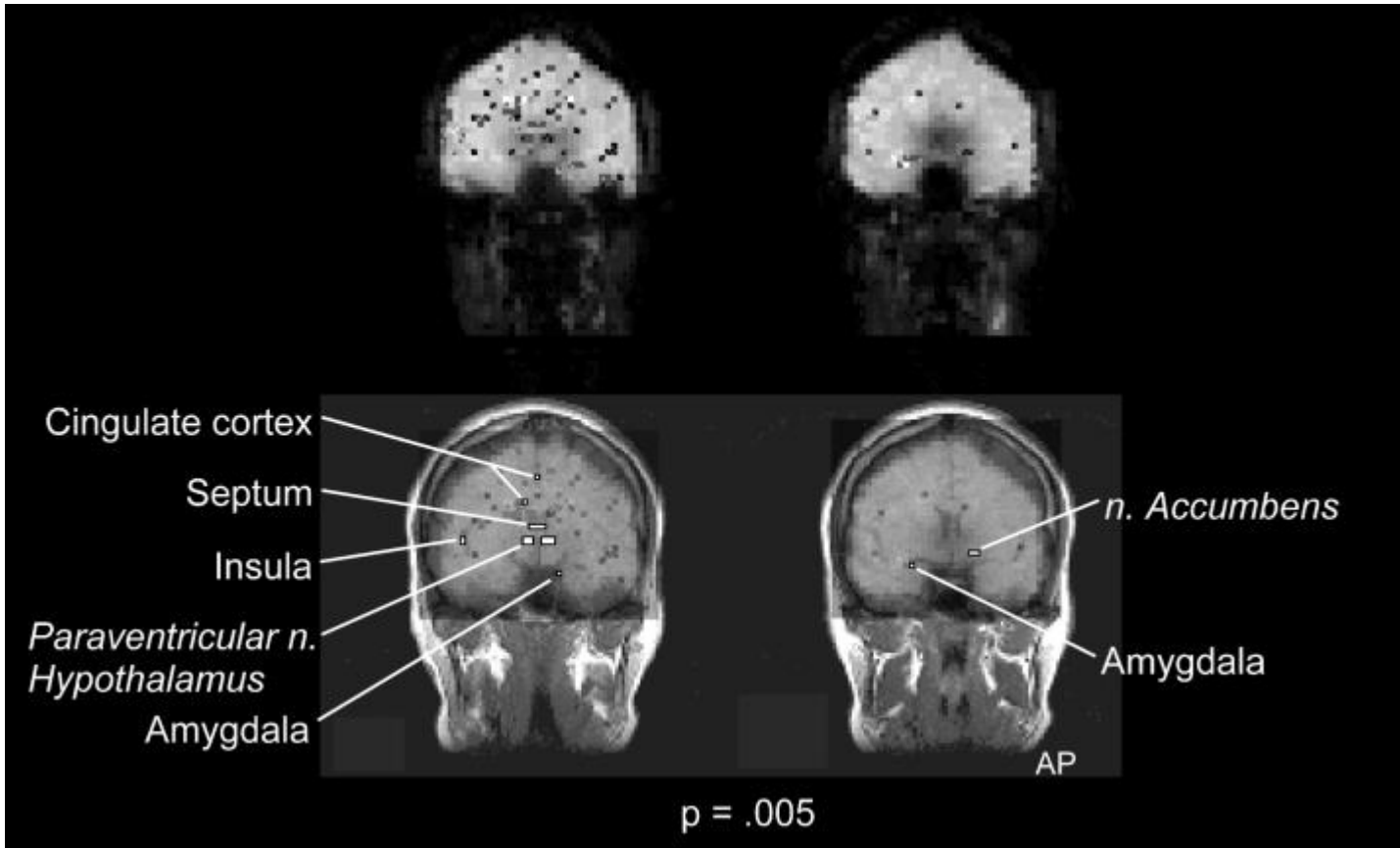
Mesolimbic and Mesocortical pathways - *Soft wiring strengthening Hardwiring* – VTA NAccumbens, Amygdala & Hippocampus, and Prefrontal Cortex

Basal Ganglia and Limbic System

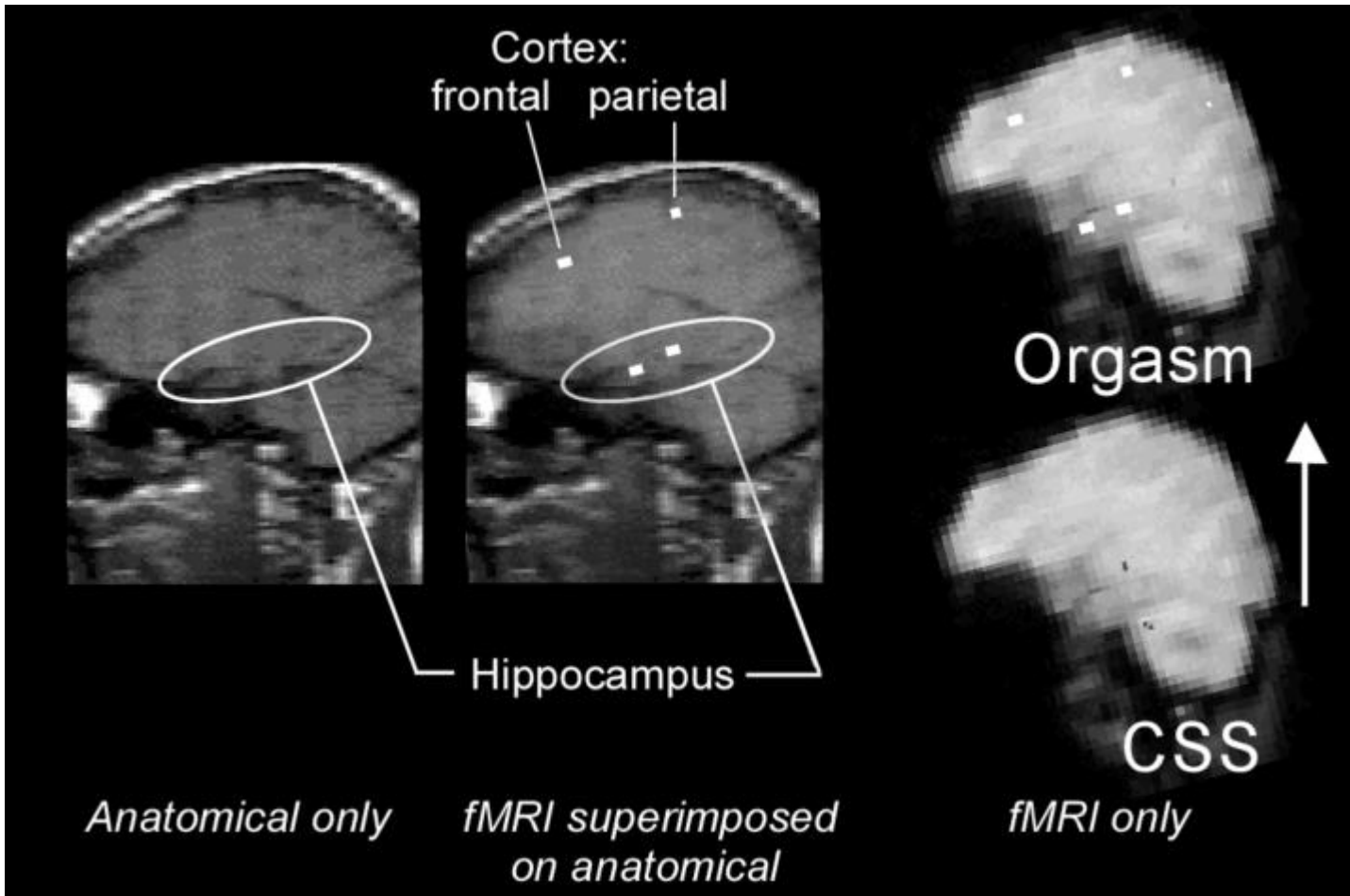


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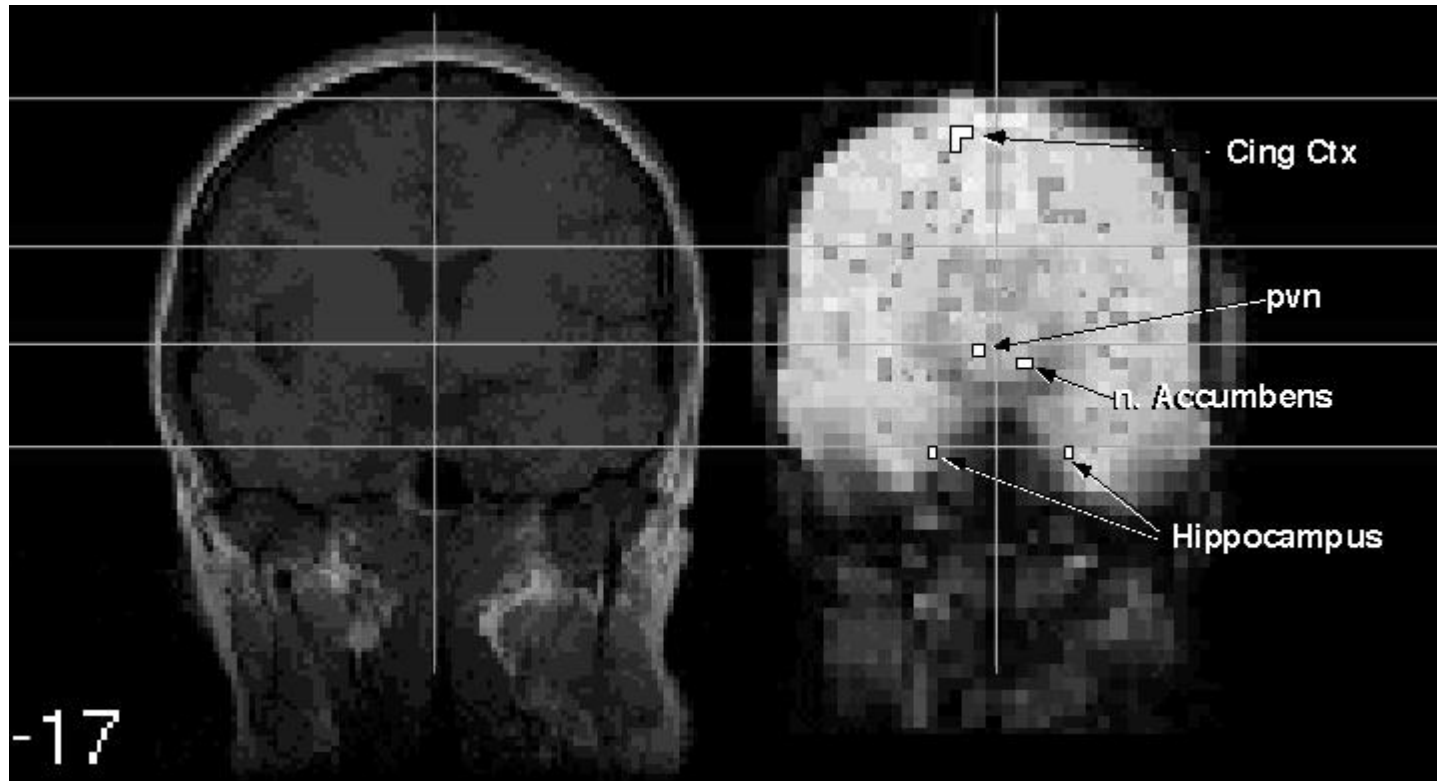
fMRI During Orgasm 1 (Komisaruk and Whipple, 2005)



fMRI During Orgasm 2 (Komisaruk and Whipple, 2005)



fMRI During Orgasm 3 (Komisaruk and Whipple, 2005)





fMRI - depression

- Transient sadness produced significant activation in the medial and inferior prefrontal cortices, the middle temporal cortex, the cerebellum and the caudate in both depressed and normal subjects (Beauregard et al, 1998)
- Patients with major depressive disorder have abnormalities in frontal and limbic neural circuitry including the amygdala, in depressed patients than in controls (Robertson et al 2007)



fMRI - Schizophrenia

- Preferential involvement of medial temporal lobe structures (74% of studies reviewed), which include the amygdala, hippocampus, and parahippocampal gyrus, and neocortical temporal lobe regions (100% of studies reviewed)
- Moderate evidence for frontal lobe abnormalities (59% of studies reviewed), particularly prefrontal grey matter and orbitofrontal regions (Martha et al, 2001)



Reward Centre or Reward System?

- Electrical stimulation activates a descending component of the medial forebrain bundle which is synaptically coupled at the ventral tegmentum to the ascending mesolimbic dopamine system thus activates a circuitous reward pathway(Bozarth, 1987a; Wise, & Bozarth, 1984)
- Dopamine is the neurotransmitter most consistently linked with reward from recreational drugs, and the ventral tegmental dopamine system has been specifically implicated in psychomotor stimulant and opiate rewards(Bozarth 1994)



Sexual Dysfunction or Reward Deficiency Syndrome?

Blum et al Nov 2008

- Craving is also associated with activation of memory circuits including the amygdala , hippocampus, and dorsal striatum all of which receive DA innervations
- Dopamine contributes to addiction by disrupting the frontal cortical circuits that regulate motivation, drive, and self-control and by memory circuits that increase the motivational salience of the drug and drug-associated stimuli (Volkow,2002)
- The orbitofrontal cortex modulates the value of rewards by regulating the magnitude of dopamine increases in the ventral striatum and that disruption of this regulation may underlie the decreased sensitivity to rewards in addicted subjects(Volkow, 2007)

Reward Deficiency Syndrome

Blum et al Nov 2008

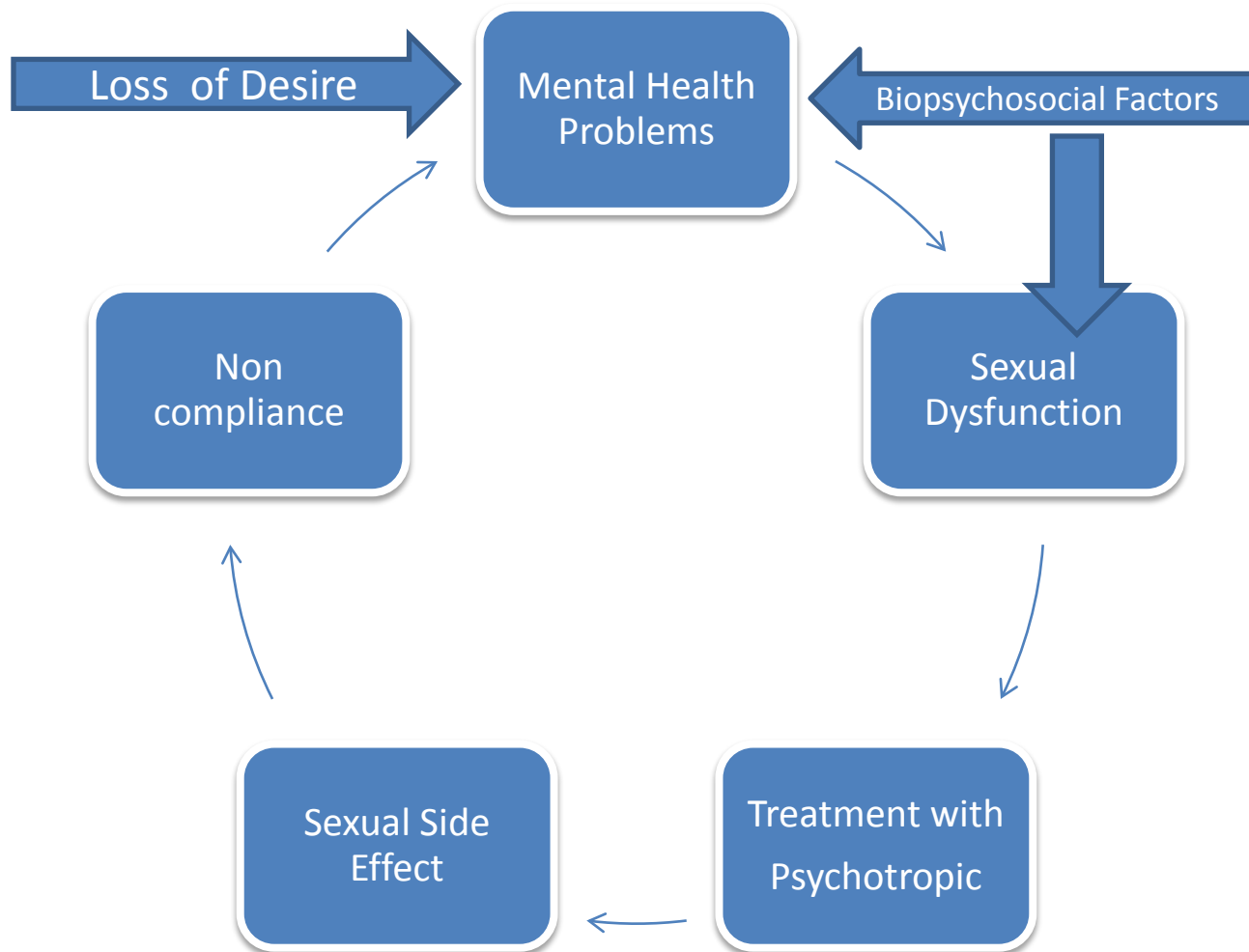
- If there is a deficiency or imbalance, the system works abnormally, causing the sense of well-being to be displaced by feelings of anxiety, anger, low self-esteem
- This can lead to cravings for substances and/or behaviours that mask or relieve those bad feelings such as carbohydrate bingeing, alcohol, or cocaine; or to other addictive behaviours such as compulsive gambling, compulsive sex, workaholics, or engaging in high risk activities



Egg or Chicken?

- Most psychiatrists and 20 to 50 percent of the patients believed that sexual functioning might contribute to psychiatric disorders, that most psychiatric disorders might interfere with sexual functioning, and that sexual activity might retard recovery (Pinderhughes, 1972)
- Sexual dysfunction is implicated as a major factor causing non-compliance (Fakhoury et al, 2001; Perkins, 2002)
- Psychiatrists survey - 17% felt competent in assessing sexual dysfunction, 88% agreeing that good sexual function is important to patients, 81.6% have had no training in this area and wanted some (Romanus et al 2008)

Egg or Chicken first?



New models & Reward System

- Barlow's(1986) and Janssen & Everaerd (1993) model inattention to sexual cues could be due to weakening of reward system as a result of negative cognitions or aversive stimuli
- Dual control model – Bancroft and Janssen (2006) - can be seen as positive and negative reinforcement in sexual reward within the sexual reward system
- Perelman Tipping model (2006) – The sexual tipping point can be considered as the threshold of dopamine required to activate the sexual reward system

Sexual Response

- Desire for Sexual Pleasure depends on an individual's Sexual Reward System
- The sexual reward system is part of the common reward pathway for all pleasurable activity
- Sexual pleasure reinforces sex seeking behaviour which is modulated by personal, social and moral constructs
- Mental Illness, Psychotropic medication and, recreational drugs affects this system resulting in Sexual Dysfunction
- Routine Assessment of Sexual Dysfunction in Psychiatric Clinic may be the best way to address the problem

Delegate questionnaire

QUESTIONS?

THANK YOU