put together by Alex Yartsev: Sorry if i used your images or data and forgot to reference you. Tell me who you are. aleksei.igorevich@gmail.com

Depression and Mania

The topic John Mitrofanis tried to get kicked out of the GMP, on basis of it having no scientific foundation.

DIAGNOSIS OF DEPRESSION

WHEN DOES SADNESS BECOME DEPRESSION??

- when these feelings become **persistent and pervasive**

(e.g. when people are **unhappy most of the day, every day** for **more than two weeks).**

- accompanied by thoughts of **hopelessness,**
- **inability to enjoy everyday activities**
- + variety of other symptoms such as **sleeplessness or weight loss**.
- Occasionally, depressed individuals complain of vague aches and pains
- rarely, they have delusional beliefs or hallucinations.

TYPICAL DEPRESSIVE MANIFESTATIONS= mainly middle adult life.
Others much harder to pick, eg. in an adolescent

COMORBIDITIES:
often anxiety, physical illnesses (e.g., stroke, hypothyroidism)
or drug treatment (eg. corticosteroids).
Occasionally, depression mimics dementia

risk factors for suicide:
- **Previous history of suicide attempt,**
- **being male,**
- **living alone,**
- **recent bereavement**
- **drug or alcohol use**

suicide risk needs to be assessed in every depressed patient.
Acute suicidal behaviour should be treated as a medical emergency.

DSM-IV Criteria for Major Depressive Episode

Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning;

at least one of the symptoms is either
(1) depressed mood or
(2) loss of interest or pleasure.

Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

(1) depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g., feels sad or empty) or observation made by others (e.g., appears tearful). **Note:** In children and adolescents, can be irritable mood.
(2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)
(3) significant weight loss when not dieting or weight gain (e.g., a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day. **Note:** In children, consider failure to make expected weight gains.
(4) Insomnia or Hypersomnia nearly every day
(5) psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
(6) fatigue or loss of energy nearly every day
(7) feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
(8) diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
(9) recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

B. The symptoms do not meet criteria for a Mixed Episode (see p. 335).
C. The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.
D. The symptoms are not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hypothyroidism).
E. The symptoms are not better accounted for by Bereavement, i.e., after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms, or psychomotor retardation.

Management : Cognitive Behaviour Therapy and Depression/Anxiety

=**An attempt to modify thoughts, behaviours and emotions**
(assumed to be important components of depression: so its not all chemistry)

There are **four major theoretical models of depression**

Seligman's learned helplessness theory;

CBT aims to help people with depressive disorders understand the link between their thoughts, behaviour and emotions
= at least as effective as first-line pharmacological treatments for major depression (eg. Elkins, Gibbons, Shea & Shaw, 1996; Scot, 1996).
= of equivalent efficacy in the treatment of severely depressed outpatients (DeRubeis et al., 1999).
= **more strongly indicated in cases of mild to moderately severe depression or as an adjunct to medication**.

Also indicated if there was prior positive response to CBT
if the patient has a preference for psychotherapy,
if medication is contraindicated,
if a competent trained clinician with expertise in CBT is available.

when dogs and rats receive uncontrollable shocks they eventually become very helpless and give up trying to avoid the shocks.
Seligman found that humans react in much the same way, but only after making the attribution (or causal explanation) **that they have no control over the negative events** in their lives.
people's attributions for past events shape their expectations about future events.
When bad things happen to people with optimistic styles they attribute the negative outcome to causes that are

- specific (confined to a particular event),
- unstable (not likely to occur regularly)
- external (not their fault alone)

when bad things happen to those with a depressive style,
the negative outcome is attributed to causes that are

- stable (occur regularly),
- global (occur across many situations)
- internal (are their fault alone).

Abrahamson's attributional model,

highlighted the role of a sense of hopelessness critical in the development of depressive disorder.
When a person with a depressive or pessimistic style experiences a negative event they will see these events as being uncontrollable, feel helpless, and become hopeless about regaining control. This hopelessness leads to depressive disorder.

Lewinsohn's learning-based model,

posits that **negative life events bring about a change in the degree to which a person's interaction with their environment is rewarding**.
Less rewards → decrease in reward-driven activities → even less opportunity for rewards →even less activity

Therapeutic strategies based on this learning based model require that **individuals with depression actively increase rewarding behaviours in their lives.**

!! Beck's cognitive model. !!

Beck's cognitive model of depression has been the most influential, widely researched and clinically applied model of major depression.

CORE OF THE MODEL: "COGNITIVE TRIAD"

1. **Seeing themselves as worthless**
2. **Seeing the world as hostile**
3. **Seeing the future as bleak**

PLUS: characteristic "THINKING ERRORS":

- black-and-white thinking
- overgeneralisation
- catastrophising

ALL THIS ARISES FROM EARLY LEARNING EXPERIENCES
= enduring core belief systems about the person's view of themselves or their environment

THUS: COGNITIVE BEHAVIOUR THERAPY:

Patients are taught to **systematically identify, evaluate and challenge the thoughts and beliefs that are believed to maintain their depression.**
For example, **once an unhelpful thought is identified** (eg. 'I will fail the test, which will show that I'm a failure as a person') **the validity of the thought is evaluated** and the dysfunctional assumptions and attributions are identified. Sometimes the **assumptions will need to be tested** by setting up a behavioural experiment in which an assumption is tested by real-life experience (eg. sit the test and see whether you pass or fail the test). Lastly, more realistic and helpful thinking is put in place of the negative thinking (eg.'I've passed other exams so far, it will be a difficult test, so even if I do fail, I am not a failure as a person"). **The scheduling of activities** is used in the early stages of therapy to counter the loss of motivation and hopelessness that characterises depression. A **weekly activity schedule** is used for planning activities that are rewarding to people in terms of the degree to which they bring about a sense of pleasure or achievement. **Goal setting and problem solving** can provide a structure to help depressed individuals to overcome the low motivation, excessive rumination and sense of hopelessness that can stop them from dealing with real-life problems and progressing in their lives.

MANAGEMENT of Depression/Anxiety

IMMEDIATE:

issues of safety (e.g. suicide risk); see next page
the setting for treatment (e.g. hospitalisation vs. outpatient, voluntary vs. involuntary treatment);
medical management (e.g. treatment of self inflicted injury).

SHORT TERM:

assessment of relevant comorbidity which might impact on treatment

- commonly anxiety disorders, such as
  - panic disorder,
  - agoraphobia
  - social phobia,
- as well as substance abuse and personality disorders.
- Alcohol abuse is one comorbid condition which has important relationships with depression.

decision making regarding specific treatment of the depression

→ ORGANIC and PSYCHIATRIC treatments:

Organic treatments
= antidepressants,
= antipsychotics
= anxiolytics
= electroconvulsive therapy (ECT).

Psychiatric treatments
= counseling and cognitive therapy.

Most patients will require some combination of these and studies show that mixing organic and psychiatric treatments is more effective than either treatment alone.

Electroconvulsive therapy: !! LAST RESORT !!
for sever unresponsive and life-threatening depression

LONG TERM:

maintenance treatment (both organic and psychological) following recovery
depression is a recurring condition
It is necessary to know how long antidepressants need to be continued following recovery and what strategies have been shown to be useful in preventing recurrences.

elements of history most predictive of a serious suicide attempt: http://www.drrichardhall.com/suicide.htm
(Suicide Risk Assessment: A Review of Risk Factors For Suicide In 100 Patients Who Made Severe Suicide Attempts;

1) **Severe anxiety (92%) and/or panic attacks (80%)**
2) **Depressed mood (80%)**
3) **Recent loss of close personal relationship (78%)**
4) **Alcohol or substance abuse (68%)**
5) **Feelings of hopelessness (64%), helplessness (62%), worthlessness (29%)**
6) **Global insomnia (46%) Partial insomnia (DFA or SCD or EMA) 92%**
7) **Anhedonia (43%)**
8) **A chronic deteriorating medical illness (41%)**
9) **Inability to maintain job or student status (36%)**
10) **Recent onset of impulsive behavior (29%)**
11) **Recent diagnosis of a life-threatening illness -- cancer, AIDS (9%)**

MAJOR RISK FACTORS FOR SUICIDE

History of suicide attempt(s)

- History of psychiatric illness
- Coexistent alcoholism or substance abuse
- Manifestation of psychotic features, especially command hallucinations, severe psychic anxiety, panic attacks, agitation, and severe insomnia
- Positive family history of suicide, especially parents
- Social isolation (eg, living alone)
- Unemployed
- Physical illness, especially chronic pain or terminal illness
- Increased age: peak risk in men is at age 75; in women, age 55 to 65
- Gender: females make more suicide attempts, but males are four times more likely to die from suicide
- Marital status: the widowed, divorced, separated, married without children, or never married are at greater risk
- Communication to family, friends, or physician of intent, financial plans after death, or specific means of suicide

Data from *Ann N Y Acad Sci.* 1997;836:288-301. *BMJ.* 2002;325:149-52.
Veterans Health Administration/Department of Defense clinical practice guideline for the management of major depressive disorder in adults.

Psychological models of anxiety

Anxiety = fundamental negative affect (emotion)

= a response to a threat, = "fight or flight"response and hypervigilance + awareness of threat
(may range from vague apprehension to intense dread or panic)

PATHOLOGICAL ANXIETY:
the source of threat is **not apparent or insufficient** to cause given response

Aetiology:
Stereotyped response to threatening environmental features: eg.
- **size** (large animals),
- **type of motion** (reptiles),
- **sounds** (crying),
- **certain interpersonal situations** (separation anxiety).

ANXIETY ENHANCES PERFORMANCE
except at **high levels**, when performance deteriorates **(Yerkes-Dodson Law).**

Separation Anxiety is the
first emotion
to appear in human development.
= first appears at 6-7 months
(when the brain is capable of evaluating threats)
= anxiety at this stage strongly related to adult episodes (John Bowlby's school)

10% of a GP's patients have anxiety disorders.
Every 6 months, 1 in 20 people will see a doctor about anxiety.

Women twice more likely

There is often a background of vulnerability, eg. history of separation anxiety; plus precipitating factors… all lead to an episode

Symptoms
- "butterflies in the stomach"
- diarrhoea
- sweating
- syncope
- tachycardia
- tingling in the extremities
- tremors
- urinary frequency, hesitancy or urgency

anxiety may also be due to
- major trauma,
- drug withdrawal,
- a range of physical illnesses (eg thyrotoxicosis),
- depression or schizophrenia.

An adequate model of anxiety integrates data from a number of disciplines including evolutionary theory, developmental studies, neurophysiology, biochemistry, and the cognitive-behavioural school of psychology. Such a model provides a framework for therapy.

DSM-IV (2000)criteria of GENERALISED ANXIETY:

1) Excessive anxiety and worry (apprehensive expectation), during **more days than not for at least 6 months**,
2)The person finds it **difficult to control the worry.**
3) Associated with three (or more) of the following six symptoms
(at least some symptoms present for more days than not for the past 6 months).
Note: Only one item is required in children.

(1) restlessness or feeling keyed up or on edge
(2) being easily fatigued
(3) difficulty concentrating or mind going blank
(4) irritability
(5) muscle tension
(6) sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep)

4) The focus of the anxiety and worry is **not confined to features of an Axis I disorder**, e.g.,
- the anxiety or worry is not about having a Panic Attack (as in Panic Disorder),
- being embarrassed in public (as in Social Phobia),
- being contaminated (as in Obsessive-Compulsive Disorder),
- being away from home or close relatives (as in Separation Anxiety Disorder),
- gaining weight (as in Anorexia Nervosa),
- having multiple physical complaints (as in Somatization Disorder),
- having a serious illness (as in Hypochondriasis),
- the anxiety and worry do not occur exclusively during Posttraumatic Stress Disorder.

5) The anxiety, worry, or physical symptoms cause clinically significant distress or impairment

6) The disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (e.g., hyperthyroidism) and does not occur exclusively during a Mood Disorder, a Psychotic Disorder, or a Pervasive Developmental Disorder.

PHARMACOLOGY of anxiety

Public Health Burden:

"**Forty five million working days are lost every year because of anxiety and stress conditions** compared to 760,000 due to strikes and labour disputes"
(from the Scrip Report on Anxiety Disorders and the Market for Anxiolytic Drugs).

BENZODIAZEPINES:

Eg. **diazepam** (VALIUM, ANTENEX, DIAZEMULS, DUCENE**),**
oxazepam (SEREPAX, ALEPAM, MURELAX),
alprazolam (KALMA, RALOZAM, XANAX).

ACTION: enhances GABA action on GABA-A receptors.
(GABA-A receptors are CHLORIDE ION CHANNELS; made of 5 subunits, thus numerous drug targets)
The influence of benzodiazepines **may be restricted to less than 20% of GABAA receptors**
I.e those that DECREASE ANXIETY are called POSITIVE MODULATORS
Those that INCREASE it are called NEGATIVE MODULATORS
(eg. flumazenil (ANEXATE) can reverse benzo overdoses by antagonising both +ve and –ve modulation)

!! PLUS !! there are endogenous benzo ligands. "endozepines" which are pro-anxiety (-ve mods)

5-HT AGENTS:

. **Buspirone is a nonsedating anxiolytic drug that acts on 5-HT receptors**
- has high affinity for 5-HT1A receptors.
The anxiolytic effect of buspirone **takes days or weeks to develop**.
Unlike benzodiazepines, buspirone does not produce sedation or loss of coordination.

Buspirone is an anxiolytic drug given at a dosage of 15 mg/day. The mechanism of action of the drug is not well characterised, but it may exert its effect by acting on the dopaminergic system in the central nervous system or by binding to serotonin (5-hydroxytryptamine) receptors. Following a oral dose of buspirone 20 mg, the drug is rapidly absorbed. The mean peak plasma concentration (Cmax) is approximately 2.5 micrograms/L, and the time to reach the peak is under 1 hour. The absolute bioavailability of buspirone is approximately 4%. Buspirone is extensively metabolised. One of the major metabolites of buspirone is 1-pyrimidinylpiperazine (1-PP), which may contribute to the pharmacological activity of buspirone. Buspirone has a volume of distribution of 5.3 L/kg, a systemic clearance of about 1.7 L/h/kg, an elimination half-life of about 2.5 hours and the pharmacokinetics are linear over the dose range 10 to 40 mg. After multiple-dose administration of buspirone 10 mg/day for 9 days, there was no accumulation of either parent compound or metabolite (1-PP). Administration with food increased the Cmax and area under the plasma concentration-time curve (AUC) of buspirone 2-fold. After a single 20 mg dose, the Cmax and AUC increased 2-fold in patients with renal impairment as compared with healthy volunteers. The Cmax and AUC were 15-fold higher for the same dose in patients with hepatic impairment compared with healthy individuals. The half-life of buspirone in patients with hepatic impairment was twice that in healthy individuals. The pharmacokinetics of buspirone were not affected by age or gender.
Clinical pharmacokinetics and pharmacodynamics f buspirone, an anxiolytic drug by Mahmood I, Sahajwalla C Division of Pharmaceutical Evaluation I, Food and Drug Administration, Rockville, Maryland, USA. Mahmoodi@CDER.FDA.GOV
Clin Pharmacokinet 1999 Apr; 36(4):277-87

RISK FACTORS OF DEPRESSION

RISK FACTORS FOR BIPOLAR DISORDER ARE GENETIC AND BIOLOGICAL

For major depression, they are psychosocial.

Evidence for the risk factors for major depression come from four different sources:

- large scale epidemiological studies.
- case-control studies
- family history studies
- twin studies, (behavioural genetics

Epidemiology

Evidence for sociodemographic risk factors for depression hase come from epidemiological studies. The Environmental Catchment Area study, was a large scale epidemiological study carried out at six different sites in the United States in the early 1980s. More recently, another large study has been conducted in the United States, the National Comorbidity Study. In the United Kingdom a similar large scale study has been undertaken, the Prevalence of Psychiatric Morbidity among adults living in private households.

RISK FACTORS:

- being female inid age group (not very young or very old)
- low socioeconomic status
- being a single parent with children
- being unemployed or economically inactive
- lower level of education
- being a homemaker rather than having outside employment

Females more often depressed because ? men express distress through substance abuse and antisocial behaviour, whereas **women are more likely to express distress with depressive symptoms**.
Another explanation is that women are subject to more life stresses than men ?

PROTECTIVE FACTORS:

Being marrier is protective for MEN but NOT FOR WOMEN!
it is the quality of the marital relationship that is important in protecting against depression.

***Genetic basis* for bipolar disorder** has been demonstrated in twin studies in which the monozygotic concordance rate for bipolar disorder is 0.79, and for dizygotic twins is 0.24.
For people suffering from bipolar disorder, the risk of a first degree relative for **bipolar** = 2.9% to 14.5%.
risk for their first degree relatives to suffer from **major depression** = 4.2% to 24.3%.
GENE LOCUS IS YET TO BE IDENTIFIED

Case Control Community Based Studies
Brown and Harris study n London = **life events precipitate depression among vulnerable individuals.**

VULNERABILITY FACTORS:

- **Early life experiences**.
    - having experienced poor or dysfunctional parenting (characterised by a lack of care or parental warmth)
    - Having a parent die before the age of 13 years
    - Child abuse (sexual or physical)
- **Personality type;** neuroticism or interpersonal sensitivity increases the risk of depression.
- **The type of social support**.
    - Individuals with poor social support,
    - being in a dysfunctional relationship
    - having a reliable confidant.= PROTECTIVE FACTOR
    - Social support may influence stress levels by buffering the individual against the emotional effects of stress.
    - A social network might also provide practical support in the face of adversity.
- **Parity**.
    - For women there is an increased risk of depression associated with childbirth, which may precipitate a first episode of depression.
    - **Having young children at home and no outside or paid employment are major risk factors.**

Life stresses and chronic difficulties
the impact of frequent (even positive) changes may be as pathogenic as a bereavement.

Behavioural Genetic Studies

In these, **the strongest predictors of depression are**

- **stressful life events**,
- a genetic background of depression,
- having a previous history of depression
- having a personality style characterised by neuroticism.

These studies have also found some associations with poor social support, early parental loss and early parental dysfunction.

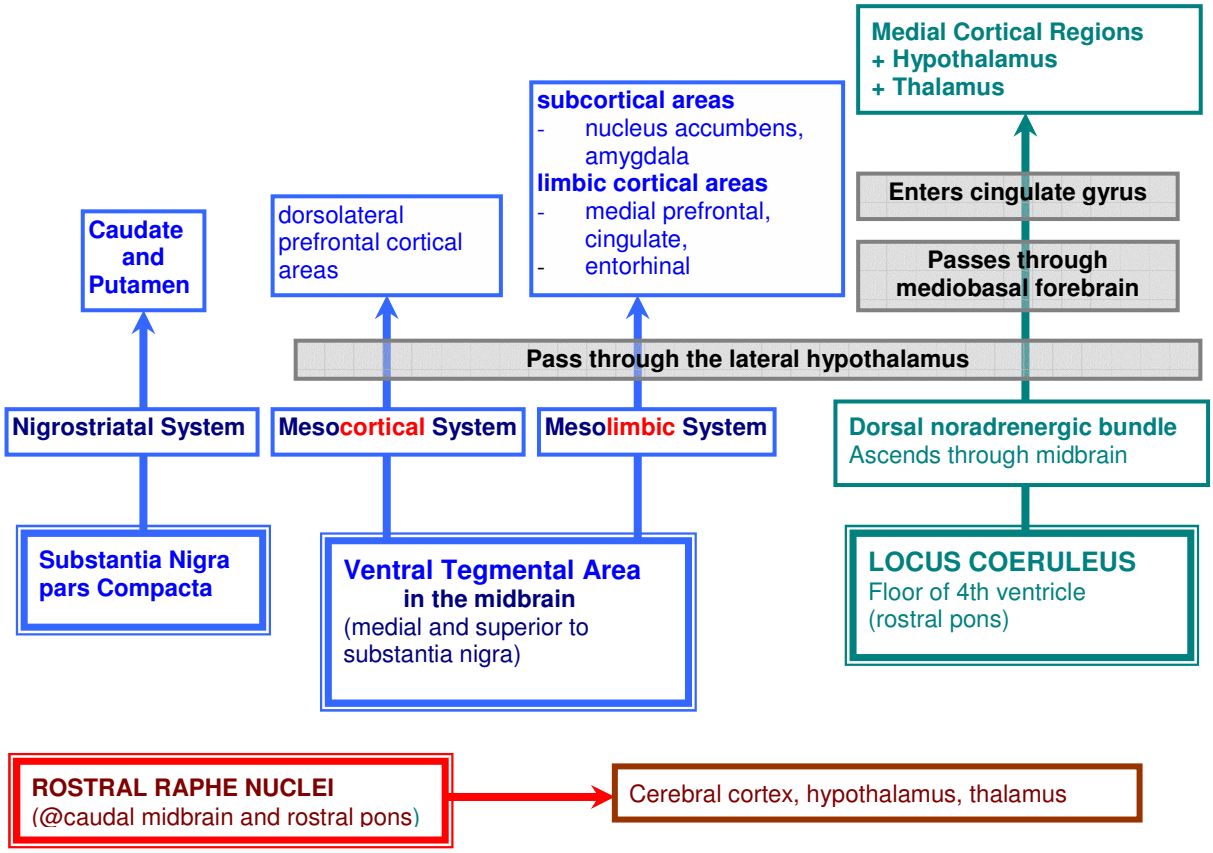
ASCENDING MONOAMINE SYSTEMS:
Mood, behaviour and affect

4 actors:
Catecholamines: Dopamine, Noradrenaline, Adrenaline.
Indoleamines:5-HT (serotonin)
These neurone cell bodies are situated mainly in the brain stem

Aminergic cells groups **in the rostral pons and midbrain**
- **the Locus Coeruleus (NA),**
- **the Rostral Raph Nuclei (5-HT)**
- **and the Ventral Tegmental Area (DA)**

= sources of direct, monosynaptic projections to the forebrain.

target widespread regions of the cerebral cortex
= profound effect on mood and behaviour



SLEEP DISORDERS

Insomnia is a complaint not a diagnosis.

INSOMNIACS perceive that their sleep is inadequate or non-restorative.
frequently complain about
- fatigue
- irritability
- mood disturbance
- poor concentration
- reduced work performance
- daytime sleepiness.

Insomnia may be experienced as **difficulty initiating sleep or difficulty maintaining sleep or both**.
CRITERIA: Chronic insomnia = insomnia lasting one month or more.
Approximately 10% of adults have chronic sleep difficulties and of these, 25-50% take regular medications

Women are more likely than men.
Prevelance increases with age.
costs $100 billion annually in medical costs and decreased productivity.

Persistent insomnia = a frequent precursor of depression,
THUS prevention or successful treatment of insomnia is likely to reduce the prevalence of depression.

Most patients with insomnia try some form of self-treatment prior to seeking medical assistance, including many inappropriate sleep behaviours such as reading or watching television in bed, non-prescription medication (anti-histamines, imported melatonin, herbal remedies such as valerian root) and alcohol.

COMORBIDITIES:
- chronic pain states
- musculo-skeletal conditions (e.g. fibrositis)
- chronic fatigue syndrome,
- chronic lung disease,
- gastrointestinal disorders (e.g. irritable bowel, reflux oesophagitis)
- cardiac disease.

Depression and insomnia are closely interlinked.
a high prevalence of insomnia in patients with anxiety disorders.
restless legs/periodic movements in sleep or sleep apnoea may present with insomnia.

The commonest form of chronic insomnia is psychophysiological insomnia.

This disorder commences with transient insomnia
chronic insomnia results from **abnormal conditioning processes** and **learned sleep-inhibiting associations**,
i.e. bedtime leads to hyperarousal rather than sleep.
Hypnotic medication is appropriate for severe cases of transient insomnia; not useful in long-term.
behavioural therapies are important in insomnia management.
Bright light exposure assists management in patients with disordered circadian rhythm-sleep interactions

Nolte (1993) *The Human Brain 3rd Ed.* **Table 11** (excerpt). p. 418)

Neurotransmitter	Location of neurons	Location of terminals	Action
NORADRENALINE	**Sympathetic ganglia**	Glands, smooth muscle	• These cells are **nearly silent electrically** during **sleep**. • They become **somewhat active** during **wakefulness**. • They are **most active** in situations that are **startling** or **call for watchfulness**. • Hence the **locus ceruleus** and other **noradrenergic neurons** may play a role in **maintaining attention** and **vigilance**
	Locus ceruleus, reticular formation	Widespread areas of forebrain, cerebellum, brainstem, spinal cord	
DOPAMINE	**Substantia nigra (compact part)**	Caudate nucleus, putamen	• The **nigrostriatal** and **mesocortical projections** to **motor cortex** are both consistent with the idea that the **dopaminergic system** is involved in the **initiation of movement**. • Its disruption is instrumental in the **movement deficits** seen in **Parkinson's disease**. • However, the extensive **dopaminergic projections** to **limbic structures** and other cortical areas suggest that this system is also involved in **motivation** and **cognition**
	Ventral tegmental area	Limbic structures, cerebral cortex	
	Hypothalamus	Infundibulum	
	Retina (some amacrine cells)	Local	
	Olfactory bulb	Local	
SEROTONIN	**Raphe nuclei**	Widespread areas of forebrain, cerebellum, brainstem, spinal cord	• The **firing rate** of **serotonergic neurons** also fluctuate with **sleep** and **wakefulness**. • It has been proposed that the **serotonin system** is more important for determining the **overall level of arousal** while the **norepineprine system** more important for **phasic changes** in **level of attention**. • n addition, the **serotonin system** has at least one other important role, as part of the **descending pain-control system**

ANATOMY OF EMOTION

Mitrofanis lecture 2004-04

NEUROLOGICALLY emotion is defined as **motor response to sensory stimulus**
A FEELING is a CORTICAL RECORDING i.e how a cortex perceives an emotion

LIMBIC SYSTEM: means "ring"; = is a ring around the corpus callosum
Composed of :

- **Cingulate gyrus**
- **Hypothalamus**
- **Hippocampus (only memory!!)**
- **Amygdala**

NEOCORTEX AND THALAMUS: Mood generators

Cingulate Cortex:

INPUTS: from mamillary bodies of hypothalamus via the anterior nuclei of thalamus
FUNCTION: pain perception
Some autonomic response to pain
LESION: no negative perception of pain; it hurts, but I wont avoid doing it again

Ventral Prefrontal Cortex: @ base of corpus callosum

INPUTS: from medial dorsal nuclus of thalamus
FUNCTION: a mood generator; connects to Amygdala
LESION: in chronic depression 50% of PFC is missing
In bipolar depression, prefrontal activity is HIGHLY INCREASED
Extensive lesion = disturbance of intellect

Orbitofrontal cortex:

INPUTS: medial dorsal nucleus of thalamus
FUNCTION: Anxiety and Anger
control of visceral autonomic activity, gut in particular

Temporal Cortex:

FUNCTION: fear and sexual activity, plus memory storage

Insula cortex:

FUNCTION: love and some autonomic function

HYPOTHALAMUS: the prince of emotion, a tiny nodule of the Diencephalon

CONTROLS EMOTIONAL EXPRESSION AND AUTONOMIC ACTIVITY

INPUTS:

- **From HIPPOCAMPUS especially the fornix**
- **From AMYGDALA (pathway = *striae terminalis)***
- **From BRAINSTEM RETICULAR FORMATION (sensory)**
- **From RETINA (via suprachiasmatic nucleus, for *circadian rhythms)***
- **From OLFACTORY CORTEX**

OUTPUT:

- Back to **BRF** for control of somatic and visceral movement
- To **SPINAL CORD** for visceral activity
- To **anterior nuclei of the Thalamus,** via the **Mamillary Bodies**

TO THE PITUITARY GLAND: a pair of VASCULAR PATHWAYS

- To the **ANTERIOR PITUITARY**: Paracrine stimulation
  - **Releasing hormones** are sent down **portal veins** into the ANTERIOR PITUITARY
  - Anterior pituitary releases ENDOCRINE HORMONES
- To the **POSTERIOR PITUITARY:**
  - Via "**paraventricular tract" veins**
  - **Release OXYTOCIN and VASOPRESSIN**

BASIC FUNCTIONS:

- Monitoring of bodily functions and addressing of imbalances
- A VISCERAL RELAY into the cortex:
- Expression of emotion: "freeze" response; "fight or flight" response
- **POSTERIOR MEDIAL AND LATERAL HYPOTHALAMUS**
  =stimulates anger and aggression via the amygdala and the BRF
- **LATERAL HYPOTHALAMUS:** pleasure and love
- **SEPTAL HYPOTHALAMUS:** sex and every other good thing

AMYGDALA: "almond"; the rattle on the tail of the caudate

INPUTS:
- **From BRF**
- **From Thalamus**
- **From Septal Hypothalamus**
- **From Hippocampus**
- **From olfactory cortex**

FUNCTION:
- Interface with memory centres: **EMOTIONAL TAGGING OF MEMORY**
- **It is much easier to deposit memories associated with fear or anxiety**
- **Plus,** amygdala also generates **Social Hierarchy Aggression** (chest beating and bellowing)
  - **= is the centre of Social competition**

LESION TO THE AMYGDALA: NO FEAR, NO ANXIETY, NO AGGRESSION.
- Emotional flatness and emotional amnesia
  (inability to respond with emotion to painful or pleasurable memories)
- Patients become very **oral,** i.e. prone to examining things with their mouths
- Patients may also become **injuriously sex-crazed,** but with preservation of intellect

MOOD DISORDERS: Dx → Hx

Mood is an emotional health state.

MANIA: excessive happiness.

To diagnose bipolar disorder, you need MANIA but not necessarily depression (!!)

- **Spectrum of hypomania to Mania with psychotic features**
- Increased physical activity
- Euphoria
- Irritability
- Delusions
- Frenzy
- hallucinations

Depression

(theory of categories):
- **Endogenous** (biological abnormality) versus **Reactive** (response of personality to experience)

(theory of continuum):
- A question of degree only;

PSYCHOTIC DEPRESSION: one with beliefs which aren't true (delusions)

BIPOLAR: need mania +/- depression

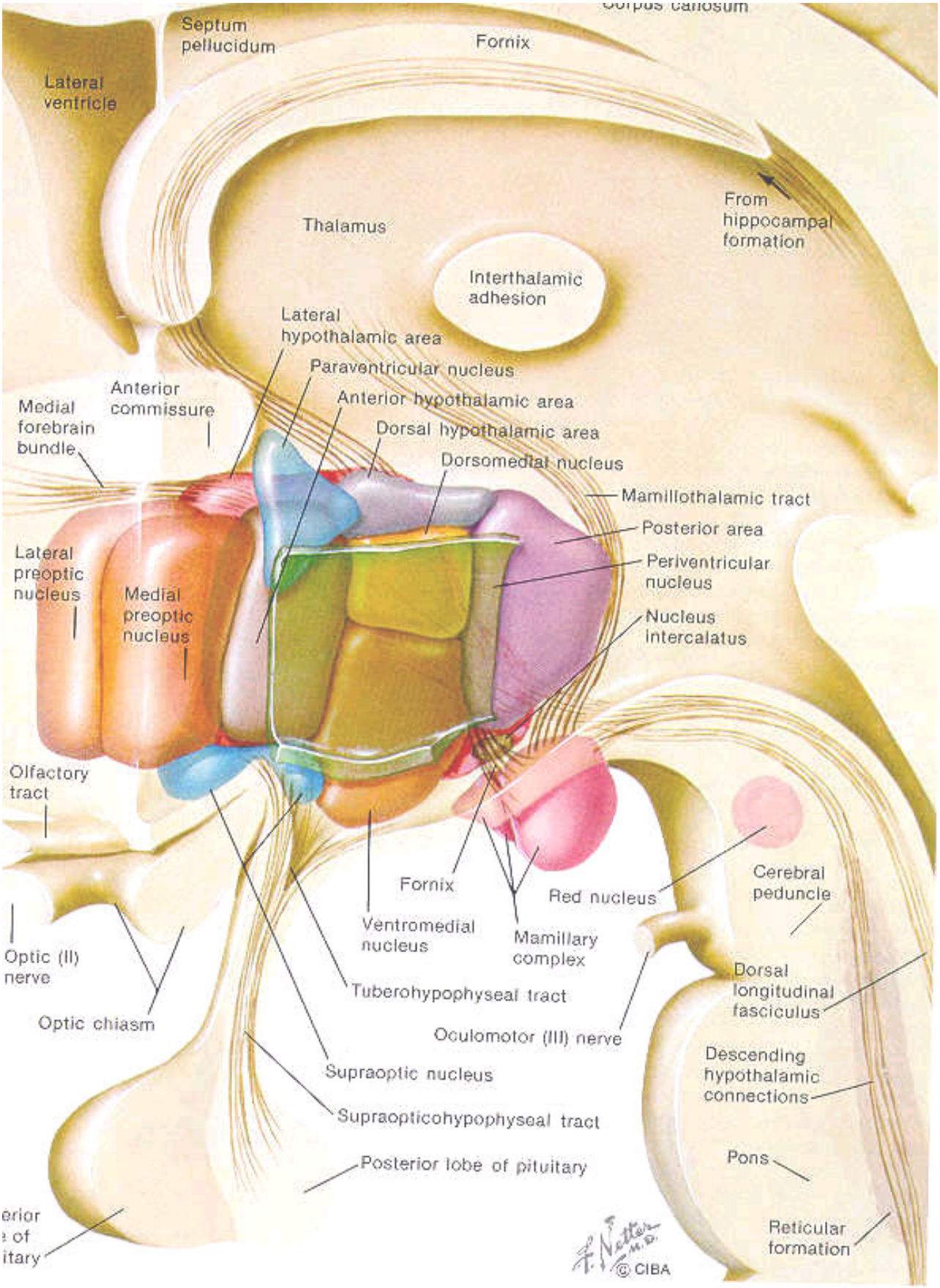
UNIPOLAR: must have never had a manic episode
Melancholic (continuous) vs. Non-melancholic (reactive to life events)

DYSTHYMIA
- **Improper reaction to life events; over-reaction**

CYCLOTHYMIA: constant instability of reaction

ADJUSTMENT DISORDER = temporary depression

PSYCH HISTORY:
- Loss of interest of enjoyment of life
- Duration criteria = over 2 weeks
- Diurnal mood variation = morning depression
- Sleep disturbance= early waking
- Decreased appetite
- Decreased libido
- Decreased concentration
- Amenorrhea
- "RETARDED DEPRESSION" – psychomotor slowing
- "DEPRESSIVE STUPOR" – sitting, not speaking.
- MASKED DEPRESSION is that which is not expressed (wholly internal)
- PREMORBID PERSONALITY is crucial: what did you do before ?


Septum pellucidum
Fornix
Lateral ventricle
From hippocampal formation
Thalamus
Interthalamic adhesion
Lateral hypothalamic area
Paraventricular nucleus
Anterior commissure
Anterior hypothalamic area
Medial forebrain bundle
Dorsal hypothalamic area
Dorsomedial nucleus
Mamillothalamic tract
Posterior area
Lateral preoptic nucleus
Periventricular nucleus
Medial preoptic nucleus
Nucleus intercalatus
Olfactory tract
Cerebral peduncle
Red nucleus
Fornix
Ventromedial nucleus
Mamillary complex
Optic (II) nerve
Tuberohypophyseal tract
Dorsal longitudinal fasciculus
Optic chiasm
Oculomotor (III) nerve
Supraoptic nucleus
Descending hypothalamic connections
Supraopticohypophyseal tract
Pons
Posterior lobe of pituitary
Reticular formation
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MECHANISM OF DEPRESSION AND ANXIETY

By Eleanor Curtin

POSSIBLE PATHOGENESES: (1) Δe & neuroanatomy (2) Neurotransmission

NORMAL POSTNATAL BRAIN DEVT:
Intense brain devt in early childhood: neurogenesis, synaptogenesis
Hotspots of activity = **HIPPOCAMPUS** (Limbic System, learning & memory) and
CEREBELLAR VERMIS (production, release Dopamine & NAdr).
Highest concentration of cortisol receptors in Limbic system & vermis.