

Beck's cognitive triad represents three types of negative thoughts present in depression. The triad involves negative thoughts about:

- The **self** (e.g. the self is worthless, helpless and/or unlovable)
- The **world/environment** (e.g. the world is unfair)
- The **future** (e.g. the future is hopeless).

Depression with Somatic Syndrome

Four of the following symptoms:

- Marked loss of interest or pleasure in activities that are normally pleasurable (anhedonia)
- Lack of emotional reactions to events or activities that normally produce an emotional response (blunted affect)
- Waking in the morning 2 hours or more before the usual time
- Depression worse in the morning (diurnal variation)
- Objective evidence of marked psychomotor retardation or agitation (remarked on or reported by other people)
- Marked loss of appetite
- Weight loss (5 % or more of body weight in the past month)
- Marked loss of libido

Somatic symptoms may be the dominant features of depression especially in the elderly.

Subtypes of clinical depression

The DSM-IV-TR recognizes five further subtypes of major depressive disorder (clinical depression), called specifiers:

- **Melancholic depression** is characterized by a loss of pleasure in most or all activities, a failure of reactivity to pleasurable stimuli, a **quality of depressed mood more pronounced than that of grief or loss**, a worsening of symptoms in the morning hours, early-morning waking, psychomotor retardation, excessive weight loss (not to be confused with anorexia nervosa), or excessive guilt. This is closely related with ICD-10 depression with somatic syndrome.
- **Atypical depression** is characterized by **mood reactivity (paradoxical anhedonia)** and positivity, **significant weight gain** or increased appetite (**hyperphagia**, comfort eating), excessive sleep or sleepiness (hypersomnia), **a sensation of heaviness in limbs known as leaden paralysis**, and significant social impairment as a consequence of hypersensitivity to perceived interpersonal rejection. Mood is reactive such that mood brightens during positive events or in response to anticipated positive events. May respond better to MAO-A inhibitors e.g. **meclobemide**.
- **Catatonic depression** is a rare and severe form of major depression involving disturbances of motor behavior and other symptoms. Here the person is mute and almost **stuporous (decreased consciousness)**, and either **remains immobile or exhibits purposeless or even**

Dysthymia is a **chronic, milder mood disturbance** in which a person reports a **low mood** almost daily over a span of **at least two years**. The symptoms are not as severe as those for major depression, although people with dysthymia are vulnerable to secondary episodes of major depression (sometimes referred to as double depression).

Persistent depressive disorder, previously known as dysthymia, is a mood disorder consisting of the same cognitive and physical problems as in depression, with less severe but longer-lasting symptoms:

- **Chronic low mood (mild) for at least two years**
- **Doesn't fulfil criteria for RDD (recurrent depressive disorder)**
- May have fulfilled criteria for mild depressive episode
- Tired and depressed for months at a time
- Usually able to cope with demands of everyday life

DON'T GET CONFUSED WITH CYCLOTHYMIA (very mild form of bipolar)

Adjustment disorder

- Adjustment disorder with depressed mood is a mood disturbance appearing as a psychological response to an **identifiable event or stressor** in which the resulting emotional or behavioural symptoms are significant but **do not meet the criteria for a major depressive episode**
- Adjustment disorder with low mood = reactive depression

Depression in Old Age

- 10-15% of older people
- Often undetected and untreated
- **Can present as pseudodementia (treatable and reversible)**
- Passive thoughts of death common
- Suicidal ideation less common- but alarming when present!
- **Often presents with predominance of somatic symptoms rather than mood symptoms**

What is pseudodementia?

- **Depressive pseudodementia** is a syndrome seen in older people whom exhibit symptoms consistent with **dementia (global cognitive decline, not just memory)** but the cause is actually clinical depression. Older people were sometimes misdiagnosed as having dementia when further investigation showed they were suffering from a major depressive episode.
- Disorders that can convert to a pseudodementia-like presentation include depression, schizophrenia, mania, dissociative disorders, conversion reaction, psychoactive drugs and Cushing's disease.

- Manic and depressive episodes last from a few days to several months.

Elevated mood states

- Mania without psychotic symptoms
- Mania with psychotic symptoms
- Hypomania – psychosis never present
- Mixed affective state (mixed state of mania and depression)

Mania

Key features of mania (without psychosis) include:

- **Elevated mood**, overactivity and increased energy
- **Pressure of speech** (rapid speech often due to **pressure of thoughts**) and **flight of ideas** (thought form disorder characterised by loosening of associations with the associations being rhythms)
- Irritability
- Suspicion
- Decreased need for sleep
- Disinhibition
- Distractibility
- Inflated self esteem and grandiose ideas
- Taking risks
- Overspending
- Perceptual disturbance

Mania with psychotic symptoms

Mania plus:

- Mood congruent delusions (often grandiose, religious, suspicious)
- Mood congruent hallucinations
- Mood incongruent symptoms

Hypomania

Hypomania is a mild to moderate level of elevated mood, characterized by optimism, pressure of speech and activity, and decreased need for sleep. **Generally, hypomania does not inhibit functioning (in contrast to mania).**

Many people with hypomania are actually more productive than usual, while manic individuals have difficulty completing tasks due to a shortened attention span.

- Reduced self esteem and self confidence
- Ideas of guilt and unworthiness
- Bleak and pessimistic views of the future
- **Ideas or acts of self harm or suicide (never forget to enquire about suicide and self harm: both in the past, present, or thoughts about future)**

Linking neurobiology to depressive symptoms

- Dysfunction of the **aversive/defensive systems** is the main thing associated with **depression**, and these systems are primarily **mediated by serotonin (and noradrenaline/norepinephrine)**.
- **Serotonin (5HT) is the dominant NT involved in aversive defensive system**
- Like most things in medicine, however, it's "just not as simple as that," and all three monoamines are involved in mood disorders (which is why MAOIs are often effective for treatment-resistant depression that has failed to respond to drugs that only work on serotonin and/or norepinephrine).
- Increasing serotonin in the synapse itself doesn't appear to be the direct way that SSRIs treat depression (takes about 16 hours for an SSRI to increase the serotonin level, but 2-6 weeks for it to work) but changes in serotonin receptors as a result of the increase in serotonin, which may then affect secondary messengers and in turn gene expression seem to be involved.

Endocrine changes in Major Depression

HPA (hypothalamic-pituitary-adrenal) axis

- **Increased secretion of CRH and ACTH** results in **increased secretion of cortisol** (pneumonic: due to the stress of being depressed)
- **Elevated cortisol in urine and saliva**
- Elevated CRH in CSF
- **Depression can therefore cause a "pseudo Cushing's syndrome"**
- Enlarged adrenal glands (due to excess stimulation and production of cortisol)
- **50-70% fail to suppress cortisol production following dexamethasone suppression test** (suggestive of pseudo-Cushing's)
- Pathophysiology not fully known but thought to be due to **chronic hypersecretion of CRH** in hypothalamus

HPT (hypothalamic-pituitary-thyroid) axis

- 20-30% MD populations show some dysfunction
- **Increased TRH in CSF**
- Pathophysiology not fully known but thought to be due to chronic hypersecretion of TRH in hypothalamus

- Extracellular uptake of NA into the cytosol is done either presynaptically (uptake 1) or by non-neuronal cells in the vicinity (uptake 2).
- **Inhibitors of uptake 1** include cocaine, amphetamine, and **tricyclic AD's => by inhibiting uptake you increase activity in the synaptic cleft**
- **Inhibitors of VMAT transportation into vesicles include the anti-psychotic reserpine.** Reserpine irreversibly blocks the vesicular monoamine transporter (VMAT). This normally transports free intracellular norepinephrine, serotonin, and dopamine in the presynaptic nerve terminal into presynaptic vesicles for subsequent release into the synaptic cleft ("exocytosis"). **Unprotected neurotransmitters are metabolized by MAO (as well as by COMT) in the cytoplasm and consequently never excite the post-synaptic cell. Therefore VMAT inhibitors => decrease monoamine activity.**
- **As the result of decreased dopamine activity, reserpine can be used to treat psychosis (reserpine is an anti-psychotic), however it can cause drug-induced Parkinson's disease. As a result of decreased 5HT activity, reserpine can cause drug-induced depression.**

Serotonergic (5HT) system

- NT= Serotonin (5-hydroxytryptamine/5HTP) – monoamines
- **Aversive/defensive system – DOMINANT NT**
- Receptors: many subtypes 5HT₁, 5HT₂, 5HT₃ (Many subtypes of receptor, most of them G-protein linked apart from the 5-HT₃ receptor)
- Best known as a transmitter in several main areas: (i) **sleep** regions, (ii) **limbic** system and mood control regions and (iii) **pain suppression** system
- Important NT for mood, memory, sleep, cognition, feeding behavior, sensory perception and analgesia
- **nuclei confined almost exclusively to the Raphe nucleus of the brain stem.**
- **Virtually every neurone in the brain may be contacted by a serotonergic fibre**
- Biosynthesis: Serotonin (5HT) is synthesized from the amino acid L-tryptophan (pathway L-tryptophan => 5HTP => 5HT)
- Vesicular transport: **VMAT transports 5HT into vesicle => VMAT inhibitors can cause low 5HT => can cause depression**
- Release: AP stimulates Ca²⁺ influx which stimulates vesicular fusion and release of 5HT into synaptic cleft
- Receptor binding: 5HT receptors (GPCRs)
- Termination: Signal termination is a result of reuptake and degradation.
- Serotonin transporters (SERT) transport serotonin back into presynaptic terminal
- **Monoamine oxidases (MAO) degrade serotonin in the cytoplasm and synaptic cleft => MAO inhibitors can increase 5HT in synaptic cleft**

Reserpine

- Sodium valproate very good for mania predominance
- Lamotrigine very good for depressive predominance

Lithium therapy

- Lithium carbonate is used to treat mania, the elevated phase of bipolar disorder.
- Also used as a prophylactic mood stabiliser

Side effects of lithium therapy

- Nausea, vomiting, anorexia, diarrhoea, **tremor**, polydipsia, polyuria
- Lithium toxicity (drowsiness, ataxia and confusion)
- **Kidney dysfunction e.g. nephrogenic DI**
- **Thyroid dysfunction – hypothyroidism**
- **Blood levels must be monitored (particularly lithium levels, U&Es, yearly CrCl and TFTs)**

Anticonvulsants as mood stabilisers

- Drugs like carbamazepine (enzyme inducer) and sodium valproate (enzyme inhibitor) are now being for prophylaxis in bipolar disorder
- Mode of action: very unclear, perhaps block overactive pathways
- Side effects:
 - Carbamazepine: drowsiness, ataxia, cardiovascular effects, induces liver enzymes (drug that increases the metabolic activity of an enzyme => decreases efficacy of some drugs affected by this enzyme e.g. OCP)
 - Sodium valproate: liver failure, **teratogenicity** (neural tube defects) – good for mania predominance
 - Lamotrigine – good for depression predominance

CAPACITY AND ABILITY TO CONSENT

- Consent is the act of **giving permission** for something to happen
- Capacity is the ability to **use and understand information to make a decision** e.g. to consent to a procedure or medical treatment
- A person has capacity until proven otherwise
- **A person may have capacity for one decision but not another e.g. they may have the capacity to consent to venepuncture, but not the capacity to consent to surgery**

What things might interfere with someone's capacity to consent?

- Cognition problems e.g. learning difficulties

BMI

- Low/Moderate risk: BMI= 16-17.5
- Moderate risk: BMI=15-16
- High risk: 13-14.9
- Very high risk: less than 13

High Risk patients

- BMI < 13.0
- Weight loss > 1kg/week
- **Prolonged QT**
- HR < 40
- SBP < 80
- Core temp < 34C
- Unable to rise from squat without using arms for leverage
- Cognitive impairment

Treatment

- Family therapy beneficial in adolescents
- Psychological therapies e.g. CBT
- Dietician
- Medical monitoring
- Inpatient treatment for high risk (mental health act if refuse tx): Re-feeding (beware of refeeding syndrome – hypophosphatemia and hyponatremia)

Mental Health Act (Care and Treatment) (Scotland) 2003

This act allows for **treatment of mental disorder or physical consequences of mental disorders** in someone without capacity to consent to treatment e.g. for treatment of anorexia (mental health disorder) or any of its physical complications (in a patient who refuses treatment)

- **Emergency Detention (section 36)** e.g. for **life threatening long QT syndrome or life threatening electrolyte imbalance (in a pt who needs detained as they refuse to stay)**
- **Short Term Detention (section 44)** e.g. for **non life threatening complications and high risk patients (in a pt who needs detained as they refuse to stay)**

MARSIPAN

- Management of really sick patients with anorexia nervosa
- RCPsych and RCPhysicians
- Aim to reduce mortality of starved patients admitted to medical wards

- In people who have a somatoform disorder, medical test results are either normal or do not explain the person's symptoms, and history and physical examination do not indicate the presence of a medical condition that could cause them.
- Somatoform disorders are **not the result of conscious malingering** (fabricating or exaggerating symptoms for secondary motives e.g. **external gain** such as monetary gain) **or conscious factitious disorders** (deliberately producing, feigning, or exaggerating symptoms - to play the "sick patient" and receive attention – **for internal gain**).
- In somatoform disorders, sufferers perceive their symptoms as real – and indeed they may be "real"
- In these disorders there is sometimes a degree of attention-seeking (histrionic) behaviour, particularly in patients who are resentful of their failure to persuade doctors of the essentially physical nature of their illness and of the need for further investigations or examinations.

Key features

There are 3 central features of somatoform disorders:

- **Physical complaints without identifiable organic basis** ("functional" disorders). May occur due to a normal body function - functioning abnormally
- **Psychological factors** and conflicts seem important in maintaining, exacerbating, and maintaining the symptoms
- Symptoms or magnified health concerns are not under conscious control

Types of somatoform disorder

- **Somatization disorder**, characterized by **many physical complaints** affecting many organ systems (over **at least 2 years**, multiple systems)
- **Conversion disorder**, characterized by one or two "functional" (medically unexplained) **neurological symptoms**
- **Hypochondriasis**, characterized by a severe anxiety focused on the possibility of having a serious disease, **health anxiety**
- **Body dysmorphic disorder**, characterized by a false belief or exaggerated perception that a body part is defective
- **Pain disorder**, characterized by symptoms of **pain** that are either solely related to or significantly exacerbated by psychological factors

Somatization disorder

- A somatization disorder is a disorder where the patient has a history of **multiple and recurrent medically unexplained symptoms (across multiple systems)** starting in early adult life and lasting for **at least 2 years**.

- The main features are multiple, recurrent, and frequently changing physical symptoms. These patients commonly present to many different specialists and are high users of health care resources.
- **Marked depression and anxiety are frequently present** and may justify specific treatment.
- The course of the disorder is chronic and fluctuating, and is often associated with long-standing disruption of social, interpersonal, and family behaviour.

Somatization disorder ICD10 diagnostic criteria

- Physical symptoms suggesting a physical disorder but with **no evidence of organic disease**
- **At least 2 years of multiple and variable physical symptoms** for which no adequate physical explanation has been found;
- Symptoms linked to **psychological factors/conflicts – may manifest subconsciously as physical symptoms**

Conversion disorder

- A conversion disorder causes patients to suffer from **neurological symptoms**, such as numbness, blindness, paralysis, or fits without a definable organic cause.
- It is thought that symptoms arise in response to stressful situations affecting a patient's mental health. Conversion disorder is considered a psychiatric disorder in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5).
- The DSM-IV classifies conversion disorder as a somatoform disorder while the ICD-10 classifies it as a dissociative disorder.
- Can use **Hoovers test of lower limbs** to assess for functional or organic leg weakness

How common are somatoform disorders?

- 33% of new Neurology outpatients => **VERY COMMON**
- 50% of patients admitted to hospital with apparent Status Epilepticus (who are actually having a psychogenic seizure)
- 5% of new referrals to Movement disorder clinics

Aetiology of Somatoform Disorders

- Predisposing e.g. genetics, adverse childhood experiences, temperaments
- Precipitating e.g. stressful life events, physical health disorder, psychiatric illness

Obsessions

- Recurrent, intrusive and distressing thoughts, ideas, images, memories, impulses
- Unwanted
- Usually resisted
- Recognised as originating from own mind
- Associated with the emergence or increase of anxiety

Common obsessions in OCD

- Contamination from dirt, germs, viruses, bodily fluids or faeces, chemicals, sticky substances, dangerous material etc
- Fear of harm e.g. door locks are not safe
- Excessive concern with order or symmetry
- Obsessions with body or physical symptoms
- Religious, sacrilegious, or blasphemous thoughts
- Sexual thoughts
- Urge to hoard useless or worn out items
- Thoughts of violence or aggression

Compulsions

- Repetitive, seemingly purposeful behaviours that individual feels driven to perform
- Can include physical and mental rituals
- Carrying out compulsions tends to reduce anxiety (which occurs as a result of obsessions) e.g. handwashing
- Resistance to performing a compulsion increases anxiety
- Usually recognised as 'irrational'

Common compulsions in OCD

- Checking e.g. doors and gas taps
- Cleaning and washing
- Repeating acts
- Mental compulsions e.g. special words or prayers repeated in a set manner
- Ordering, symmetry or exactness
- Hoarding and collecting
- Counting

OCD diagnostic criteria (ICD 10)

- Is the anxiety restricted to having a panic attack? If yes => panic disorder (no specific triggers)
- Is the anxiety restricted to being publicly embarrassed? If yes => social phobia
- Is anxiety restricted to obsessions (fears) and/or compulsions? If yes => OCD
- Is anxiety related to fears of gaining weight? If yes => eating disorder
- Is the anxiety related to fears of having an illness? If yes => hypochondriasis
- Is the anxiety only associated with a traumatic event? If yes => PTSD (> 28 days) or other stress disorder e.g. acute stress disorder (2 days to 28 days), adjustment disorder (mild trauma stressor)
- Is the anxiety generalized and not associated with any of the above? If yes => generalized anxiety disorder (GAD)

Management of anxiety

- **When possible, it is always best to start with non-pharmacological measures e.g. CBT.**
- Psychotherapy primarily targets deep rooted issues and fears etc and focuses on changing behaviour and thought process/content in the attempt to offer a long term solution to the problem. Psychotherapy also includes therapies whose aims are to relax the patient and alleviate stress and muscle tension thereby resulting in alleviation of anxiety.
- In severe cases, pharmacological measures will almost certainly be required. Pharmacological treatment can open up the mind and allow psychotherapy to be much more effective (1+1=3).

GAD management

Step 1: Provide Education and options for treatment. Monitor symptoms and functioning (known as active monitoring)

Step 2: Low intensity psychological interventions including individual non facilitated self help which is based on CBT principles or psychoeducation in groups based on CBT principles

Step 3: For those with **marked functional impairment** unresponsive to Step 1 and 2 interventions:

- Consider an individual high intensity psychological intervention e.g. **CBT** (12 to 15 one hour sessions) or applied relaxation (12 to 15 one hour sessions)
- Drug treatment (**SSRIs are first line e.g. paroxetine**)

Specific Phobias

- Animals
- Environment: height, water, storms etc
- Situational: airplanes, lifts, cinema etc

- Anxiety symptoms e.g. headache, dizziness, light headedness, dry mouth, palpitations, racing heart, chest pain or discomfort, SOB, tremor, nausea, sweating, trembling

Management:

- CBT
- **Desensitisation** (a form of behaviour therapy which involves being gradually exposed over a period of time to the object or situation of your fear so that you start to feel less anxious about it). Desensitisation is also called exposure therapy.
- Medication e.g. **SSRI, beta blockers**

Agoraphobia

Agoraphobia is an anxiety disorder characterized by anxiety in situations **where the sufferer perceives certain environments as dangerous or uncomfortable**, often due to the environment's vast openness or crowdedness. These situations include, but are not limited to, wide-open spaces, as well as uncontrollable social situations such as the possibility of being met in shopping malls, airports, and on bridges. **Agoraphobia may or may not result in panic attacks.**

Agoraphobia is often, but not always, compounded by a fear of social embarrassment, as the agoraphobic fears the onset of a panic attack and appearing in a tent in public. This is also sometimes called 'social agoraphobia' which may be a type of "social phobia". **Not all agoraphobia is social in nature, however. Some agoraphobics have only a fear of open spaces.**

Management:

- CBT
- **Desensitisation** (a form of behaviour therapy which involves being gradually exposed over a period of time to the object or situation of your fear so that you start to feel less anxious about it). Desensitisation is also called exposure therapy.
- Medication e.g. SSRI

Panic disorder (panic attacks)

- Panic attacks are **discrete periods of intense anxiety, fear or discomfort that develop abruptly and peak in 10 minutes.**
- **Physical symptoms (sympathetic NS)** of panic attacks include: headache, dizziness, light headedness, dry mouth, syncope, palpitations, increased heart rate, pounding heart, sweating, shaking, trembling, spasm, SOB, nausea, tingling, chills, hot flushes, chest pain or chest discomfort

Compulsions:

- Repetitive behaviours (e.g. cleaning and washing hands) or mental acts (e.g. counting, praying, repeating words) that the person feels driven to perform in response to an obsessional thought
- These behaviours serve to reduce the distress associated with the obsessional thought/image

NICE Guidance for OCD

1. If the symptoms are mild and the patient expresses a preference for a psychological intervention- the initial treatment offered should be low intensity psychological input up to 10 therapist hours. These include brief individual **CBT (with exposure and response prevention ERP) and group CBT (ERP)**

2. If the above is insufficient/or the patient is not able to engage with a psychological approach, they should be given the choice of:

- Medication with **SSRI e.g. fluoxetine**
- Further course of brief individual CBT (up to 10 sessions)

3. Adults with OCD with moderate functional impairment should be offered either:

- SSRI
- More intensive CBT (more than 10 therapist hours)

Both of the above are similarly efficacious.

CBT for OCD

- Exposure and Response Prevention (type of exposure therapy) CBT
- In EPR the patient is exposed to their feared stimulus (e.g. leaving lights switched on) for a brief period of time which is gradually titrated upwards e.g. leaving light switches off for longer and longer.
- CBT should also aim to identify any possible core underlying beliefs which may be playing a role in the pathophysiology e.g. which may be linked to an overvalued sense of responsibility or guilt
- Self monitoring using a thought record diary
- Re-labelling the thought for what it really is
- Incorporating anxiety management

- A small number of people withdrawing from benzodiazepines experience a severe protracted withdrawal syndrome which can resemble schizophrenia and be misdiagnosed as such.
- A more general medical and neurological examination may be needed to rule out medical illnesses which may produce psychotic schizophrenia-like symptoms (such as metabolic disturbance, systemic infection, syphilis, HIV infection, epilepsy, and brain lesions)
- **Stroke, multiple sclerosis, hyperthyroidism, hypothyroidism and dementias such as Alzheimer's disease, Huntington's disease, frontotemporal dementia and Lewy Body dementia may also be associated with schizophrenia-like psychotic symptoms.**
- It may be necessary to rule out a delirium, which can be distinguished by visual hallucinations, acute onset and fluctuating level of consciousness, and indicates an underlying medical illness. Investigations are not generally repeated for relapse unless there is a specific medical indication or possible adverse effects from antipsychotic medication.

Schizophreniform disorder (DSM)

- Schizophreniform disorder is a mental disorder diagnosed when **symptoms of schizophrenia are present for a significant portion of the time within a one-month period, but signs of disruption are not present for the full six months required for the diagnosis of schizophrenia (DSM IV criteria)**
- The symptoms of both disorders can include delusions, hallucinations, disorganized speech, disorganized or catatonic behavior, and social withdrawal.
- While impairment in social, occupational, or academic functioning is required for the diagnosis of schizophrenia, **in schizophreniform disorder an individual's level of functioning may or may not be affected.**
- While the onset of schizophrenia is often gradual over a number of months or years, the onset of schizophreniform disorder can be relatively rapid.
- Like schizophrenia, schizophreniform disorder is often treated with **antipsychotic medications**, especially the **atypical (e.g. risperidone, olanzapine and clozapine; "ROC")**, along with a variety of social supports (such as individual CBT, family therapy, occupational therapy, etc.) designed to reduce the social and emotional impact of the illness.
- The prognosis varies depending upon the nature, severity, and duration of the symptoms, but about two-thirds of individuals diagnosed with schizophreniform disorder go on to develop schizophrenia.

Schizoaffective disorder

- Schizoaffective disorder is a mental disorder characterized by **psychosis and abnormal emotional/affective responses (mood disorder) – in the same time period (separated by at least 2 weeks)**
- Common symptoms of psychosis include auditory hallucinations, paranoid delusions, and disorganized speech and thinking.
- Schizoaffective disorder is divided into two mood disorder types: bipolar or depressive. The bipolar type is distinguished by symptoms of mania, hypomania, or mixed episodes; the depressive type by symptoms of depression exclusively.

- The mainstay of current treatment is **antipsychotic medication** combined with **mood stabilizer medication or antidepressant medication**, or both. When there is risk to self or others, usually early in treatment, brief hospitalization may be necessary. Psychiatric rehabilitation, psychotherapy, and vocational rehabilitation are very important for recovery of higher psychosocial function e.g. active stress management during education or employment.
- In DSM-5 and ICD-10 (which is being revised to ICD-11, to be published in 2015), schizoaffective disorder is in the same diagnostic class as schizophrenia, but not in the same class as mood disorders.
- **When psychotic symptoms occur during a mood episode of depression, mania, hypomania, or mixed episode, the DSM-5 indicates that the diagnosis must be either psychotic depression or psychotic bipolar disorder. Only when a psychotic condition lasts two-weeks continuously or longer without mood symptoms, is the diagnosis either schizophrenia or schizoaffective disorder.**

Summary

- Schizophrenia is a chronic psychiatric disorder that encompasses several different symptom domains: positive, negative, affective, aggressive and cognitive.
- **Positive symptoms** include hallucinations, delusions, passivity phenomenon, and thought interference, and are often the most responsive to anti-psychotic treatment.
- **Negative symptoms** include apathy, anhedonia and flat affect.
- Cognitive symptoms include attention deficits and impaired executive function.
- In addition to positive, negative, aggressive and cognitive symptoms, patients with schizophrenia often exhibit affective disorders, including depression and anxiety.
- Affective symptoms in schizophrenia can be particularly disturbing for patients with schizophrenia, increasing the risk of suicide and diminishing quality of life.
- **There is substantial overlap among these different symptom domains and it can be particularly difficult to distinguish negative symptoms from affective symptoms (including depression and anxiety)**
- The comorbidity of affective symptoms, especially depression, can have dire consequences for the quality of life and life span of those with schizophrenia; thus it is important that affective symptoms are properly diagnosed and treated optimally.
- **With someone presenting with psychotic symptoms it is uncommon to have prominent affective symptoms in schizophrenia - the prominent thing is the psychotic symptoms.** If affective symptoms are present they are not generally severe. This is in contrast to someone presenting with psychotic depression or mania with psychosis where the affective symptoms are generally very prominent and severe, as well as the psychotic symptoms - and it is necessary to recognise both sets of symptoms to reach a clear diagnosis.
- However in the lifelong course of schizophrenia, depressive symptoms are common - not necessarily as part of a psychotic relapse as they can occur at any time and do not have to be related to psychotic symptoms. Additionally, feeling depressed (subjectively low mood without necessarily having biological symptoms of depression) can be an indication of imminent relapse.
- The issue of schizoaffective disorder is complex and a little controversial - the best way to think of it, without getting into the complex arguments is to say that although "pure" schizophrenia is recognisable in many patients, and "pure" BPD/MDD is recognisable in many others, **there are also many patients who have features of both schizophrenia and BPD/MDD and for whom it is impossible to say they have one or the other - they have**

This is based on evidence that negative and cognitive symptoms persist despite D2 blockade with antipsychotics.

ANTIPSYCHOTICS

- Antipsychotics (also known as neuroleptics or major tranquilizers) are a class of psychiatric medication primarily used to **manage psychosis** (including delusions, hallucinations, or disordered thought), particularly in schizophrenia and bipolar disorder, and is increasingly being used in the management of non-psychotic disorders.
- **Anti-psychotics = dopamine antagonists** (dopamine receptor blockers) – but have a range of NT channel profiles

Typical antipsychotics

Vague definition, which describes the drugs originally developed or even drugs that do not have atypical properties:

- **Haloperidol**
- **Chlorpromazine**
- **Significant extra-pyramidal symptoms** (due to DA blockade in the basal ganglia)

Atypical (2nd generation) antipsychotics

- **Less likely to induce EPS** (extra-pyramidal basal ganglia symptoms)
- **High 5-HT_{2A} to D₂ receptor ratio**
- **Better efficacy against negative symptoms**
- **However greater risk of metabolic syndrome: weight gain, DM, hyperlipidaemia**
- Effective in patients unresponsive to typical drugs
- Atypicals include **clozapine, olanzapine, and risperidone ("ROC")**

Remember: Risperidone can be given as depot

Anti-psychotics: mechanism of action

- All antipsychotic drugs tend to **block D₂ receptors in the dopamine pathways of the brain**. This means that dopamine released in these pathways has less effect.
- In addition to the antagonistic effects of dopamine, antipsychotics (particular atypical antipsychotics) also **block serotonin receptors**. The over-activation of the serotonin receptor subtype, 5-HT_{2A} has been linked to psychotic experiences such as visual and auditory hallucinations, various delusion disorders, and manic episodes
- Atypical antipsychotics are better at treating negative symptoms in addition to positive symptoms
- **Typical antipsychotics are not particularly selective** and also block dopamine receptors in the mesocortical pathway and the nigrostriatal pathway. Blocking D₂ receptors in these

- Substance withdrawal, esp. alcohol, benzodiazepines
- Substance intoxication
- Traumatic head injury

VINDICATE: Mnemonic for differential diagnosis and aetiology

Differential diagnosis is the systematic method by which diseases of similar presentation are distinguished by considering their various features. VINDICATE is mnemonic which helps to remember the various types of diseases to be considered in a differential diagnosis. VINDICATE stands for

- V – Vascular
- I – Inflammatory
- N – Neoplastic
- D – Degenerative / Deficiency
- I – Idiopathic, Intoxication
- C – Congenital
- A – Autoimmune / Allergic
- T – Traumatic or toxic
- E – Endocrine or metabolic

PERSONALITY DISORDERS AND BEHAVIOURAL PROBLEMS IN ADULTS

Personality disorders

- Personality disorders are a class of social disorders characterised by enduring maladaptive patterns of behaviour, cognition and inner experience, exhibited across many contexts and deviating markedly from those accepted by the individual's culture.
- These patterns develop early, are inflexible and are associated with significant distress or disability.
- There are many issues with classifying a personality disorder - is it really a disorder, or just difficulties getting on socially?

Clinical Personality Assessment

- Detailed history of problem behaviour and psychological history.
- MSE
- International Personality Disorder Examination

OCD on the other hand, is characterised by ego-dystonic thoughts and behaviour e.g. obsessions and compulsions are in conflict with the needs and goals of the ego, or, further, in conflict with a person's ideal self-image.

Treatment of PD

- Psychotherapy e.g. **CBT**
- Psychopharmacology e.g. fluoxetine (**SSRI**)
- Follow NICE Guidelines

LEARNING DISABILITIES

A learning disability (LD) is a condition of arrested or incomplete development of the mind, which is especially characterised by: impairment of skills, manifested during the developmental period, which contribute to the overall level of intelligence, i.e. cognitive, language, motor, and social abilities => **global developmental delay**

In other words:

- Impairment in intellectual functioning e.g. **low IQ (<70)**
- Impairment of adaptive/social functioning (low emotional intelligence EQ)
- Onset during developmental period e.g. childhood
- Global developmental delay

Definition and Classification of learning disability

Must fulfil 3 criteria:

- Intellectual impairment (**IQ $\leq$ 70**)
- **Social or adaptive dysfunction**
- **Onset in the developmental period** (thus excluding people with dementia or other adult-onset diseases/injury affecting the brain)

Learning disability is a descriptive diagnosis or concept, not a disease or illness. It does not infer a particular aetiology. Social functioning is an integral part of the diagnosis. It is important to understand that it is different from mental illness – **a person with a learning disability can also develop mental illness**. Learning disability as a concept is also different from 'learning difficulties', which generally refers to specific learning problems (e.g. dyslexia), rather than a global impairment of intellect and function.

Prevalence of people with learning disability is 1-2%,

- Slow with comprehension and language
- Limited achievements
- Delayed self care and motor skills
- **Simple practical tasks** - often with supervision
- Usually fully mobile
- Discrepant profiles
- **Majority organic aetiology**
- **Epilepsy and physical disability common**

Severe LD

- IQ 20-35
- Generally more marked impairment than in moderate LD and **achievements more restricted**
- **Epilepsy common**
- **Organic aetiology**

Profound LD

- IQ less than 20 (difficult to measure)
- Severe limitation in ability to understand or comply with requests or instructions
- **Little or no self-care**
- Often severe mobility restriction
- Physical disorders common
- **Organic aetiology**
- Basic or simple tasks may be acquired

Associated Problems

People with learning disability as a group have **higher rates of physical and mental health problems** and consequently higher morbidity and mortality rates. Conditions may result from the same underlying cause as the person's learning disability (e.g. cerebral palsy due to hypoxic brain damage).

- Mental Illness e.g. SZ, MDD, BPD, anxiety disorders
- Epilepsy: Up to 1/3 have epilepsy, depending on severity LD. May be due to same underlying cause as the learning disability. Treatment resistance and multiple seizure types more common. Interaction with medications.
- Substance misuse
- Physical disability and mobility problems e.g. Cerebral palsy
- GI disorders
- Sensory impairments
- Autistic Spectrum Disorder
- Sexual abuse
- Family dysfunction
- Poor employment prospects

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- Drugs used in detoxification process:
 - **Reducing prescribed opioids:** Some opioid detox programs use **methadone in decreasing amounts** in their detox protocol
 - The anti-hypertensive (alpha 2 adrenergic agonist) drug **lofexidine** is sometimes added to shorten the withdrawal time and relieve physical symptoms.
 - Benzodiazepines: can have a role in detoxification
 - Opiate blockade with naloxone (still limited option, only impulsive relapsers)

Opioid replacement therapies (ORT)

- **Methadone or buprenorphine:** Synthetic opioids which can be used to treat opioid addiction
- **Form of harm reduction** (but can also be used in detox by gradually decreasing the dose) +. Less harmful than street drugs, less risks as not injecting
- Risks to patients: Poly drug use and drug death
- Reduced illicit opioid use/heroin use
- Reduced injection-related risk behaviours

Conclusions

- Problem drug use is common
- Opiate use is prevalent in UK
- High risk activity
- High cost to society
- Treatment aims to reduce drug-related harm while promoting recovery
- **Options range from longer term opioid replacement therapy (ORT with methadone or buprenorphine) to shorter term (detox/biosocial – titrate opioid down gradually)**
- Choice reflects persons particular circumstances at assessment
- Surveys of medical staff show that they routinely stigmatise this population

CONTINGENCY MANAGEMENT (CM)

What is CM?

- A behavioural treatment based on learning principles, specifically, **positive reinforcement**
- Rewards desired or therapeutically appropriate behaviours
- What is a reinforcer? Anything that changes the frequency of a behaviour
- What is positive reinforcement? **Rewarding a behaviour so that it increases in frequency**
- What behaviours might we want to reward in a CM programme from substance misusers? Attendance, attending on time, illicit drug use, medication compliance, BBV (blood borne viruses) testing/vaccination, completing homework assignments, attending mutual aid groups
- Examples = “reduce illicit drug use” and “improve attendance”. How could these be made specific and verifiable? For example, abstinence from heroin use in methadone maintenance patients could be verified by urine drug screening.

- AUDIT score 8-15: Hazardous Drinking: A pattern of alcohol consumption that increases someone's risk of harm
- AUDIT score 16-19: Harmful Drinking: A pattern of alcohol consumption that is causing mental or physical damage
- AUDIT score 20+ Dependent Drinking

Recommended limit

- Men 3-4 units per day (**21 units per week max**) – with two alcohol free days
- Women 2-3 units per day (**14 units per week max**) – with two alcohol free days
- Binge > 8 units men; > 6 units women

Hazardous drinking

- AUDIT score 8-15
- Management = **brief intervention e.g. simple advice**
- There is consistent evidence from a large number of studies that brief intervention in primary care can reduce total alcohol consumption and episodes of binge drinking in hazardous drinkers, for periods lasting up to a year. There is limited evidence that this effect may be sustained for longer periods.

Harmful drinking

- AUDIT score 16-19
- Management = **extended brief intervention** e.g. simple advice, brief counselling and continued monitoring

Dependent drinking

- AUDIT score 20+
- Management = **referral to specialist for diagnostic evaluation and treatment**

Alcohol dependence syndrome

Categorised by:

- Compulsion: **strong desire to take alcohol** (psychological dependency)

- ACh is the transmitter of the **parasympathetic half of the autonomic nervous system** (pre ganglionic and post ganglionic)
- Also released by **pre-ganglionic neurones in sympathetic NS** (pre ganglions and ACh stimulate adrenal glands)
- **ACh is NT in skeletal muscle**
- People with Alzheimer's disease are usually found to have a substantially low level of acetylcholine. Degeneration of neurons that produce ACh (**e.g. Nucleus basalis of Meynert**) have been linked to Alzheimer's disease. This is why acetylcholinesterase inhibitors are indicated in mild AD (e.g. rivastigmine, donepezil and galantamine)

Dopamine

- **Appetitive/approach system**
- Active in **selected areas** of brain
- Dopamine (DA) is involved in a wide variety of behaviours and emotions, including pleasure.
- Dopamine is the neurotransmitter that helps controls voluntary movements of the body (**basal ganglia system e.g. nigrostriatal**)
- Dopamine is associated with the **reward mechanism** of the brain. In other words, dopamine regulates the pleasurable emotions.
- Drugs like cocaine, heroin, nicotine, opium, and even alcohol increase the level of this neurotransmitter.
- **A significantly low level of dopamine in basal ganglia system is associated with Parkinson's disease**
- **Patients of schizophrenia are usually found to have excess dopamine in mesolimbic system (resulting in positive symptoms) and low levels in mesocortical (negative symptoms)**
- DA is the precursor (chemical messenger) that is turned into NA, so is closely related to NA and often affected by the same drugs. DA and NA are members of the transmitter family known as the catecholamines.

DA is an important transmitter in several brain systems:

- **Extrapyramidal basal ganglia motor system** e.g. nigrostriatal pathways (posture and movement control)
- **Mesolimbic/mesocortical** system (midbrain connections to limbic system and cortex respectively) which is important for emotional and cognitive functions respectively
- **Hypothalamus-pituitary system** (menstrual and other hormone regulation) e.g. dopamine is a potent inhibitor of prolactin release => anti-psychotics (dopamine antagonists) can result in prolactin hypersecretion (particularly typicals such as haloperidol and chlorpromazine)

Serotonin

- **Widely distributed**
- **Aversive / defensive system – major NT**
- Serotonin is an important inhibitory neurotransmitter, which can have a profound effect on emotion, mood, and anxiety. It is involved in regulating sleep, wakefulness, and eating, appetite, aggressive behaviour and pain.

Acetyl choline (ACh)	Muscle movement, attention, arousal, memory, emotion. Widespread. Nucleus basalis of Meynert.	Relative excess of ACh to DA in PD => hence why anti-muscarinics may be of use	Alzheimer's disease
Dopamine (DA)	Voluntary movement, learning, memory, emotion. Localised. Mesocortical. Mesolimbic. Nigrostriatal.	Schizophrenia (positive symptoms) and psychosis in the mesolimbic system	Parkinsonism (in the nigrostriatal pathway of basal ganglia) Schizophrenia (negative symptoms) in the Mesocortical system
Serotonin (5HT)	Sleep, wakefulness, appetite, mood, aggression, impulsivity, sensory perception, temperature regulation, pain suppression. Widespread.	Serotonin syndrome (e.g. in MAO inhibitors such as meclizemide)	MDD
NA (noradrenaline)	Learning, memory, dreaming, awakening, emotion, stress-related increase in heart rate, stress-related slowing of digestive processes. Widespread.	Anxiety, HT crisis	MDD
GABA	Main inhibitory neurotransmitter in the brain. Glycine is the major inhibitor of the spinal cord.	Alcohol use BDZ	Alcohol withdrawal
Glutamate	Main excitatory neurotransmitter in the brain	MS Alcohol withdrawal	
Endorphins	Pain relief, pleasure		

SUMMARY OF ADDICTION

- Addiction is a compulsive seeking, and then obtaining, of a substance while behavior increasingly becomes out of control
- Addiction is caused by a combination of genetics, environment and stress
- Many types of neurotransmitters play an important role including **dopamine**, serotonin, and noradrenaline
- Some sources focused solely on dopamine or a dopamine variants, while others credited the neurotransmitters gamma-aminobutyric acid (GABA), glutamate, and opioids as playing roles in addiction as well. It is more likely that all the neurotransmitters listed play some sort of role in addiction- their roles are just not fixed in scientific knowledge yet.

- D. Tricyclic antidepressants are the first line pharmacological treatment for OCD – SSRIs are
- E. Most patient with OCD have no other mental illness as very specific parts of the brain are affected

10. Which statement regarding schemas is true?

- A. People with no mental illness tend not to have any schemas
- B. Negative childhood experiences are the main cause of schemas
- C. Changing a patient's schemas is quite straightforward with the right therapy
- D. Most people with mild anxiety and good insight are aware of their schemas
- E. The content of someone's assumptions and automatic thoughts tells us about their schemas

Answers

- 1. D
- 2. C
- 3. B
- 4. E
- 5. C
- 6. E
- 7. D
- 8. B
- 9. C
- 10. E

FORMATIVE QUESTIONS 2

5. What would be the best treatment for this patient?

I've not had any treatment for my mental health before, but I've become increasingly worried about how I've been feeling in recent weeks. I've been waking up very early in the morning and can't get back to sleep, I just lie awake worrying about my situation. I don't feel like eating much and my clothes feel loose, I think I might have lost a bit of weight. I'm very tired and I can't be bothered doing anything, not even meeting up with my friends or playing football. I've been off work for the past three weeks- just couldn't concentrate. I don't really see the point in anything anymore, maybe it would be better if I wasn't here.

- A. Lithium carbonate
- B. No treatment- watchful waiting
- C. Selective serotonin reuptake inhibitor
- D. Atypical antipsychotic
- E. Tricyclic antidepressant

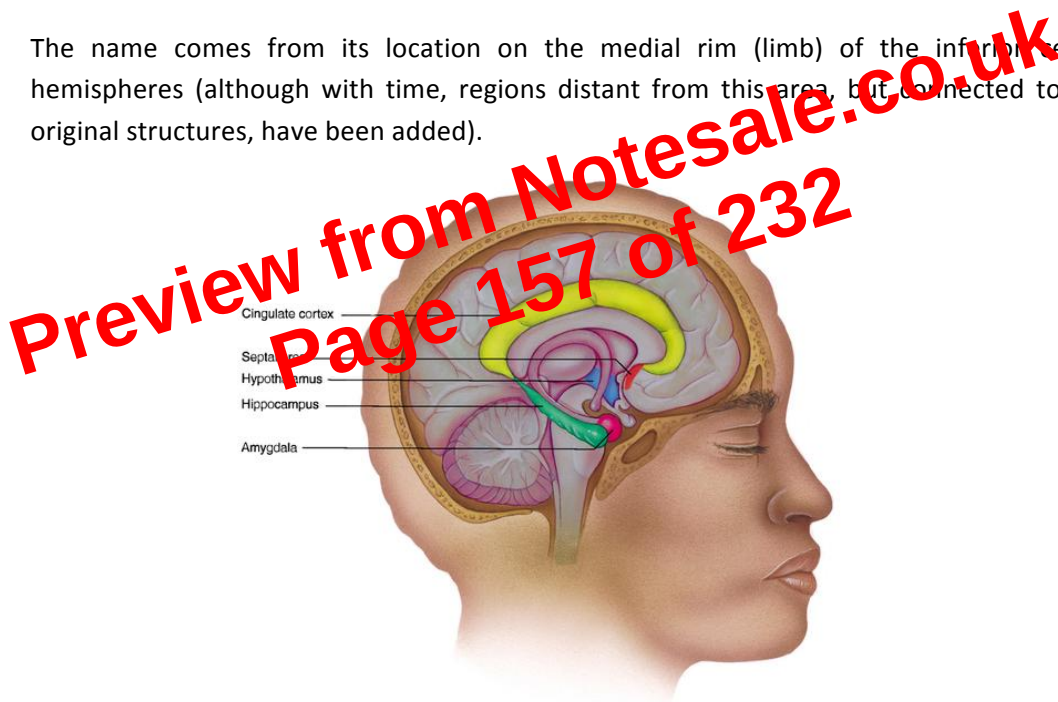
2. Which of these thoughts is an obsession?

- A. "Since I had my baby I keep getting thoughts in my head about dropping her or letting go of her pram on a hill. I know it's silly and try not to think about these things but I can't help it."
- B. "He's obsessed with football, he loves it so much he is always talking about it"
- C. "I can't stand the house not being perfectly tidy, I spend hours on the housework"
- D. "I miss my late husband so much, I just can't stop thinking about him"

1. C
2. A
3. D
4. D
5. A
6. A – as she requires detention

ANATOMY OF THE LIMBIC SYSTEM AND MEMORY

- The limbic system is believed to have a special role in **emotional experience** and **visceral (ANS and endocrine) regulation**. The structures were originally considered as a series of linked structures associated with emotion. It is now obvious that some components act primarily in other capacities (e.g. the hippocampus functions mainly in memory).
- Neocortical (part of cerebral cortex) association areas of the limbic system (e.g. cingulate cortex) have substantial input into the limbic system, linking higher, 'directed' behaviour (thinking cortex brain) to 'instinctive behaviour' (feeling limbic brain).
- The name comes from its location on the medial rim (limb) of the inferior cerebral hemispheres (although with time, regions distant from this area, but connected to these original structures, have been added).



The limbic system consists of a group of related structures which **ultimately project to the hypothalamus (output)**:

- Neocortex (temporal, frontal and parietal lobes)
- Cingulate gyrus
- Parahippocampal gyrus
- Septal Area

- Hippocampus and dentate gyrus
- Amygdala
- Hypothalamus
- Anterior thalamic nuclei

Flow of information through the limbic system

- The limbic lobe consists of parts of the **frontal, parietal and temporal lobes**.
- The cingulate cortex is a part of the brain situated in the medial aspect of the cerebral cortex.
- The **cingulate cortex** receives inputs from the thalamus and the neocortex, and projects to the **hippocampal formation** (via the entorhinal cortex), the **amygdala** and the **septum** ("HAS"). It is an integral part of the limbic system, which is involved with emotion formation and processing, learning, and memory.
- The combination of these three functions makes the cingulate gyrus highly influential in linking behavioral outcomes to motivation (e.g. certain actions induce a positive emotional response, which results in learning).
- **This role makes the cingulate cortex highly important in disorders such as depression and schizophrenia.** It also plays a role in executive function and internal homeostasis (e.g. respiratory control)
- The hippocampal formation, the amygdala and the septum, have distinct functions which shall be described later. They also project information into the hypothalamus which also has multiple functions in particular regulating autonomic and endocrine functions.
- The hypothalamus then feeds information onto the thalamus which in turn communicates with the cingulate gyrus completing the **feedback loop**.
- The thalamus has multiple functions. It may be thought of as a kind of **switchboard of information**. It is generally believed to act as a relay between a variety of subcortical areas and the cerebral cortex. In particular, every sensory system (with the exception of the olfactory system) includes a thalamic nucleus (e.g. lateral geniculate nucleus for visual information) that receives sensory signals and sends them to the associated primary cortical area.

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- It also receives afferent inputs from the hippocampus (via the fornix), the septum and the amygdala.
- In addition there are inputs from most of the body as well as from olfaction, the viscera and the retina.
- It also has internal sensors for temperature, osmolarity, glucose and sodium concentration.
- In addition, there are receptors for various internal signals, particularly hormones. These include steroid hormones, and other hormones as well as internal signals (such as hormones involved in appetite control such as leptin).
- **Autonomic functions are controlled via efferents to the brain stem and spinal cord.** There are localized areas in the hypothalamus that will activate the sympathetic nervous system and some that will increase parasympathetic activity.
- Endocrine functions are controlled either by direct axonal connections to the posterior pituitary gland (vasopressin/ADH and oxytocin control) or via release of releasing factors into the hypothalamic-hypophyseal portal system (to influence anterior pituitary function).
- There are also projections to the reticular formation that are involved in certain behaviors, particularly emotional reactions and arousal.
- Finally, the suprachiasmatic nucleus receives direct retinal input from photosensitive ganglion cells. This nucleus is responsible for entraining **circadian rhythms** to the day-night cycle.

Summary of the limbic system

- The limbic system is a convenient way of describing several functionally and anatomically interconnected nuclei and cortical/subcortical structures.
- These nuclei serve several functions, however most have control of functions necessary for emotions, memories, self preservation and species preservation.
- They regulate **autonomic and endocrine function**, particularly in response to emotional stimuli.
- They set the **level of arousal (RAS)** and are involved in motivation and reinforcing behaviors.
- Additionally, many of these areas are critical to particular types of memory (e.g. emotionally charged memories) and storage of long term memories
- **Functions of the limbic system include regulation of: energy and water balance, autonomic functions, temperature, endocrine functions, sexual behaviour, emotional behaviour, reward/reinforcement, learning and memory**
- Some of these regions are closely connected to the olfactory system, since this system is critical to the survival of many species.

Limbic cortex:

- Parahippocampal gyrus: Plays a role in the formation of spatial memory.
- Cingulate gyrus: Autonomic functions regulating heart rate, blood pressure and cognitive and attentional processing.
- Entorhinal cortex: Important memory and associative components.
- Orbitofrontal cortex: Required for decision making

- DH: prescribed drugs (care with anti-cholinergic in the elderly as these can cause memory problems), OTC drugs, illicit drugs, alcohol (life-long history)
- FH

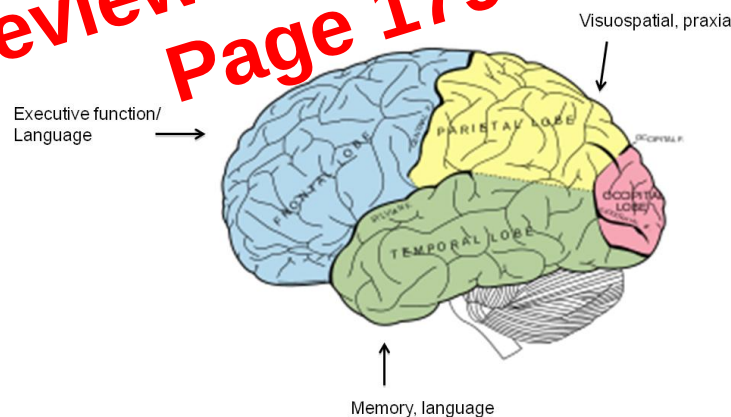
Cognitive domains

- **Discrete brain regions have selective functions**
- Dementia may selectively involve certain “cognitive functions” in such a way that one can provide a **clinical diagnosis** by recognising pattern

Cognitive functions

- Attention/ concentration (frontal lobe)
- Executive function (frontal lobe) including behavioural changes
- Language (expressive- Brocas area in the dominant frontal lobe; receptive- Wernickes area in the dominant temporal lobe)
- Memory: Frontal (short term and working) and temporal/limbic (long term)
- Visuospatial function (agnosia): parietal
- Orientation (time, place, person)
- Praxis (motor skills) – including basal ganglia, cerebellum and parietal

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Discrete brain regions have selective functions

2b. Semantic memory

- Semantic memory loss is **loss of general knowledge** about the world including words
- Semantic memory loss is often accompanied with a marked reduction in verbal fluency and impairment of irregular words (dyslexia) e.g. pint
- Example of disease: **Semantic dementia (variant of Frontotemporal dementia)**
- Localisation? Anterior **temporal lobe atrophy**

ACE-r assessment of memory

Memory: anterograde memory

- Give patient an address (repeat up to 3 times) and ask them to repeat later

Memory: retrograde memory

- Name of current prime minister
- Name of the woman who was prime minister
- Name of the USA president

Memory: recall

- Ask: "which 3 words did I ask you to repeat and remember?"

Language: reading

- Ask the subject to read the words on the assessment form e.g. sew, pint, soot, dough, height

Language: naming

- Ask the subject to name objects e.g. "which one is a marsupial?"

3. Executive function

- Considered to be a facet of **frontal lobe function**
- Regulate/ oversee cognitive function
- **Important for problem solving, mental flexibility, planning, reasoning**
- **Attention/ concentration** (in part) is also a facet of executive function

Testing executive function

- Proverbs
- Estimates

- Dementia is not one disease, but a clinical syndrome caused by many different disease processes

Treatable dementia

Less than 5% of cases presenting with dementia have a treatable cause. These include:

- Hypothyroidism
- Vitamin B1 deficiency (thiamine)
- Vitamin B12 deficiency (cobalamin)
- Normal pressure hydrocephalus (“wet, wacky and wobbly”)
- Space occupying lesion (SOL)
- Pseudodementia (many causes including depression)
- Infective causes e.g. HIV and syphilis
- Metabolic causes

Investigations (dementia screen)

- Urea and electrolytes (U+Es)
- Thyroid function tests (TFTs)
- B12 and folate
- FBE (full blood exam)
- Syphilis and HIV serology
- EEG (usually abnormal in early AD, in contrast to frontotemporal dementia)
- CT (not considered essential)
- SPECT (where regional dementia is suspected). SPECT studies have 90-100% sensitivity in discriminating AD patients from healthy controls
- MRI (may help to exclude vascular dementia)

Pathology of AD

- AD is characterized by gradual cognitive decline in **particular of episodic anterograde amnesia (initially) due to hippocampus involvement**. Many other symptoms can occur such as behaviour and personality changes, depression, problems with language etc
- The brain is lighter (due to **atrophy of brain tissue**) with more prominent sulci (widened sulci) and narrowed gyri and enlarged ventricles.
- There is progressive loss of neurons and synapses with the presence of large numbers of **extracellular beta amyloid plaques and intracellular neurofibrillary tangles (tau protein)**.
- The regions of gray matter with the most marked cell loss are the basal forebrain, **hippocampus**, entorhinal, and temporal cortices. **The medial temporal lobes are affected the greatest in the initial stages**. It is this region of the brain which is very important for storage of long term episodic memories.

- **The nucleus basalis of Meynert is the main source of acetylcholine for the cortex.** This disruption of cholinergic transmission is partly how Alzheimers disease affects cognitive function (in particular memory function).
- Cholinesterase inhibitors block the action of acetylcholinesterase, an enzyme that removes acetylcholine from the synapse; they therefore increase ACh in the synapse and improve cholinergic transmission.
- They have been found to improve the symptoms of Alzheimers disease or delay further cognitive decline, but as they do not act on the processes that cause Alzheimers in the first place, they cannot cure the disease or stop it in its tracks.

Pharmacological management of Alzheimers disease

- Cholinesterase inhibitors
- Memantine

Acetylcholinesterase inhibitors (AChE Inhibitors)

The cholinesterase inhibitors in current clinical use are:

- Donepezil
- Rivastigmine
- Galantamine

They do not affect the underlying pathological processes in Alzheimers disease, **but do slow cognitive decline by increasing cholinergic transmission.**

They are licensed for use in **mild to moderate Alzheimers disease.** Rivastigmine is also licensed for use in DLB. There is some evidence that they are useful in vascular dementia but they are not currently licensed for this indication

They are well-tolerated by most patients, although common side effects include:

- **Parasympathetic overactivity** resulting in: bradycardia, hypotension, bronchoconstriction and hypersecretion
- GI upset (often settles after the first few weeks)
- Tiredness
- Headache
- Sleep disturbance

NB: Excessive inhibition of AChE can result in a **cholinergic crisis** which is an over-stimulation at a neuromuscular junction due to an excess of acetylcholine (ACh), which counter-intuitively results in paralysis of skeletal muscles. AChE inhibitors are also used to increase ACh levels in myasthenia gravis, however if the dose is too high then a cholinergic crisis can occur resulting in paralysis of skeletal muscles including the diaphragm => **respiratory failure can occur.**

- Semantic dementia (SD): SD is characterised by loss of semantic memory in both the verbal and non-verbal domains. The most common presenting symptoms are in the verbal domain however **(with loss of word meaning)** and it is characterized as a primary progressive aphasia.
- Progressive nonfluent aphasia (PNFA). Patients present with a breakdown in speech fluency due to articulation difficulty, phonological and/or syntactic errors but preservation of word comprehension. People lose their ability to generate words easily, and their speech becomes halting, **"tongue-tied"** and ungrammatical. Ability to read and write also may be impaired.

Progressive Behaviour/Personality Decline

- Behavioural variant FTD (BVFTD): takes its greatest toll on personality and behavior. It may begin with subtle changes that may be mistaken for depression. As BVFTD progresses people often develop disinhibition, a striking loss of restraint in personal relations and social life. Apathy, reduced initiative, inappropriate and impulsive behaviours, Emotional flatness or excessive emotions. Memory generally intact
- Picks disease

Progressive Motor Decline

- FTD with amyotrophic lateral sclerosis (FTD/ALS/MND)
- FTD with parkinsonism
- Progressive supranuclear palsy (PSP): Parkinson plus syndrome (parkinsonism, bulbar palsy, supranuclear ocular apraxia, dementia)
- Multi-system atrophy: Parkinson plus syndrome (parkinsonism, cerebellar involvement, significant ANS involvement)

Summary of differential features

Alzheimer's disease (AD)	Cognitive impairment: Anterograde amnesia (inability to learn and retain new information in particular episodic memory), Plus impairment in one of the following: Reasoning Visuospatial ability (agnosia) Orientation Language
Dementia with cerebrovascular disease (VaD)	Cognitive impairment as for AD Plus evidence of cerebrovascular disease
Dementia with Lewy bodies (DLB)	Cognitive impairment as for AD, Plus two of the following: Parkinsonism

	Visual hallucinations Fluctuations in arousal REM sleep behaviour disorder. There may also be delusions
Frontotemporal dementia (FTD)	Either of the following: 1. Decline in regulation of personal or interpersonal conduct (loss of empathy for others; socially inappropriate behavior that are rude or sexually explicit; mental rigidity; decline in personal hygiene; obsessional behaviors), or 2. Impaired reasoning or handling of complex tasks, out of proportion to impairments of recent memory or spatial ability. 3. There is also often rapid decline in language skills

Neuroimaging in dementia

Alzheimer's Disease

Structural Imaging:

- Early mild cognitive impairment have **medial temporal lobe involvement (where hippocampus and limbic system are present)**
- As cognitive decline progresses, there is increasing involvement of the temporal neocortex, parietal regions and eventually, of all cortical regions
- **Atrophy of the whole brain (and hippocampus in particular)** accelerates as the patient moves from normality to cognitive impairment, and as dementia progresses.
- The cortical volume loss in AD leads to **ventricular enlargement**, white matter tract atrophy (including the corpus callosum), and smaller total brain volume
- Prominent sulci and widening of gyri

Vascular Dementia

- **This can result from large-vessel (cortical) or small-vessel (subcortical) vascular disease.**
- Cognitive decline may develop as a direct result of the vascular injury (eg, multi-infarcts or a single stroke affecting a strategic location) and/or lowering the threshold for the expression of concomitant pathology, such as AD.
- **Subcortical vascular dementia** is the most common form of vascular dementia, and refers to cognitive impairment secondary to **lacunar infarction** and **small-vessel disease, or leukoaraiosis.**
- Lacunar infarctions, therefore, occur in the basal ganglia, putamen, internal capsule, thalamus, corona radiata and centrum and lateral brainstem.

- Rivastigmine
- Galantamine

Licensed for the “symptomatic” treatment of **mild to moderate** Alzheimer’s Disease (Rivastigmine also licensed for dementia in Parkinson’s Disease).

They have also been used clinically in Dementia with Lewy Bodies where patients are particularly sensitive to neuroleptic medication.

Mechanism of action is based on the cholinergic hypothesis:

- Acetylcholine (ACh): neurotransmitter implicated in cognitive processes.
- Degeneration of cholinergic neurones and reduction in levels of ACh in synapse is a key feature of AD
- ACh is metabolised by acetylcholinesterase (AChE).
- AChE inhibitors **increase the concentration of ACh** by preventing its metabolism

Cholinergic Side Effects include:

- **Bradycardia and hypotension**
- Nausea, vomiting, diarrhoea
- Headaches, dizziness
- Fatigue
- Muscle cramps
- Sweating
- Weight loss
- Disturbed sleep and nightmares

AChE Inhibitors: Precautions

- **Cardiovascular:** bradycardia, conductivity defects, sick sinus syndrome
- GI: duodenal ulcer.
- Neurological: epilepsy, Parkinson’s Disease.
- Pulmonary: severe COPD, asthma.
- Genitourinary: urinary outflow obstruction, recovering from bladder surgery.
- Anaesthesia: likely to exaggerate acetylcholine type muscle relaxation during anaesthesia

Memantine

- Glutamate NMDA receptor blocker (antagonist)
- Licensed in UK for **moderate to severe** Alzheimer’s Disease.
- Safe and well tolerated but vertigo, excitation and insomnia reported.
- It is now recommended for use in NHS.

- Antimuscarinic symptoms e.g. blurred vision, urinary retention, constipation, dry mouth, dry eyes
- **Cardiac effects**
- **Extrapyramidal effects (EPSE):** parkinsonian symptoms, dystonia, akathisia, tardive dyskinesia
- **Neuroleptic Malignant Syndrome (very rare)**

In particular, they should NEVER be used in Dementia with Lewy Bodies or in Parkinson Disease Dementia (as decreasing dopamine effects can greatly worsen these conditions)

Small doses of haloperidol are sometimes useful in delirium for short-term therapy while underlying physical cause is treated.

Atypical neuroleptics

- **Group of newer drugs with less or no EPSE.**
- Drugs include: Risperidone, olanzapine and clozapine (ROC)
- Side effects include: **weight gain**, hyperglycaemia, cardiac effects, hypersalivation, sedation.
- **Increased serotonin effects can result in metabolic syndrome meaning that these drugs are contraindicated in some patients, and typical anti-psychotics may be preferred**
- **Risperidone** is now licensed also for short-term treatment (6/52) of persistent aggression in moderate to severe Alzheimer's dementia

Hypnotics and anxiolytics

- Try sleeping hygiene first e.g. warm baths/aromatherapy, relaxation, milky drink/non-alcohol, moderate heating, fresh air/exercise
- Benzodiazepines: shorter acting preferred for insomnia (temazepam, lormetazepam). Others (lorazepam, diazepam) can be used **short-term** for extreme anxiety/agitation.
- **Other hypnotics: "Z" drugs: zopiclone, zolpidem, zaleplon – these are usually preferred over BDZ for hypnotic effects**

Antidepressants

- In spite of low numbers of studies, TCAs, Moclobemide (MAO-A inhibitor) and SSRIs have shown benefits
- **SSRIs are preferred by clinicians as they are better tolerated.**
- Other antidepressants such as Venlafaxine (SNRI) and Mirtazapine (NaSSA) are used but there is less research evidence.

Mental health legislation

CAPACITY AND ABILITY TO CONSENT

- Consent is the act of **giving permission** for something to happen
- Capacity is the ability to **use and understand information to make a decision** e.g. to consent to a procedure or medical treatment
- Capacity is **situation specific**
- **A person may have capacity for one decision but not another** e.g. they may have the capacity to consent to venepuncture, but not the capacity to consent to surgery

What things might interfere with someone's capacity to consent?

- Cognition problems e.g. learning difficulties or LDs
- Mental health disorders which cause cognition problems e.g. dementia, brain damage, bipolar, depression
- Confusion either as a result of a mental health or medical condition
- Intoxication caused by drug or alcohol misuse

Capacity and consent

To have capacity someone must be able to:

- **Understand and retain relevant information** e.g. what the problem is, available treatments, risks versus benefits, and outcomes
- Use and weigh that information to make an informed decision
- Communicate that decision

To consent to a medical intervention the patient must have understanding of:

- What the intervention is, its nature and purpose and why it is being proposed
- Main benefits/risks/alternatives
- Consequences of not receiving intervention

Capacity should be assumed unless proven otherwise. All adults are presumed to have sufficient capacity to decide on their own medical treatment unless there is significant evidence to suggest otherwise.

Any evidence that a person does not have this capacity has to show both of the following:

- A person's mind or brain is impaired or disturbed.
- The impairment or disturbance means the person is unable to make a decision at the current time.

In an emergency consider "best interests" => no need for consent in emergency situations (either from individual or relative)

Surgical procedures (non emergency) need written consent. Most other Tx, verbal consent suffices.

- Consult with other relevant persons
- Encourage the adult to use residual capacity

Mental Health (Care and Treatment) (Scotland) Act 2003

- This act allows for **treatment of mental disorder or physical consequences of mental disorders** in someone with impaired decision making ability AND who requires detention
 - Emergency Detention (**section 36**)
 - Short Term Detention (**section 44**)
 - CTO's

Criteria for Emergency Detention (section 36)

- 1) **Likely to have a mental disorder**
- 2) Significantly impaired decision-making ability regarding treatment, due to mental disorder (note that this criteria does NOT mean lack of capacity, as they may indeed have a degree of capacity)
- 3) Detention in hospital is necessary as a **matter of urgency** to determine what treatment is needed
- 4) Risk to health, safety or welfare of the person, or safety of others
- 5) **Making arrangements for section 44 would involve undesirable delay**

Criteria for Short Term Detention (section 44)

- 1) Has a mental disorder
- 2) Significantly impaired decision-making ability regarding treatment, due to mental disorder (note that this criteria does NOT mean lack of capacity, as they may indeed have some capacity)
- 3) Detention in hospital is necessary for assessment or treatment (**but non urgent**)
- 4) Risk to health, safety or welfare of the person, or safety of others
- 5) Cannot be treated voluntarily

NOTE: IF PT DOES NOT NEED DETAINED, THEN CAN USE AWI (IF THEY LACK CAPACITY)

Age of Legal Capacity (Scotland) Act 1991

- **Assume capacity if aged over 16 (unless proven otherwise).**
- Under 16's can consent to medical treatment on their own behalf if they have capacity (e.g. Gillick competence) to do so in the opinion of a qualified medical practitioner attending them e.g. **a 12 year old may have the capacity to consent to an injection but not surgery.**
- **Depends on situation and child.**

CAPACITY AND CONSENT

Information on the Mental Health (Care and Treatment) (Scotland) Act 2003

PLEASE NOTE THERE IS A DIFFERENT MENTAL HEALTH ACT IN SCOTLAND FROM ENGLAND, WALES AND NORTHERN IRELAND- so don't be confused by questions on the English one on online exam revision sites!

Information on the Adults with Incapacity (Scotland) Act 2000

Please note that Scotland has different capacity legislation from the rest of the UK! Don't be confused by questions about the English Mental Capacity Act on online exam revision sites!

The parts of AWI that I expect you to know about are:

- Use AWI section 47 to authorise **treatment of a physical or mental disorder** in someone **without capacity to consent to that treatment** e.g. due to a language problem, psychiatric problem or learning disability (*may or may not have a mental condition*)
- Medical practitioner responsible for the patient's care authorises treatment
- **Power of Attorney:** This is a written document giving someone else authority to take actions or make decisions on your behalf. The Power of Attorney (PoA) document contains the name of the person(s) whom you want to help you, i.e. the attorney and a list of the individual powers that you want your attorney to have. The powers must be written down individually to make it clear as to what decisions your attorney can make on your behalf. The PoA will also include when your attorney is to begin acting for you. **It lets YOU say who you want to look after your affairs and what you want your attorney to be able to do for you if you become incapable of looking after your own affairs.** The PoA provides legal authority for the attorney to make decisions for you e.g. medical decisions and financial decisions.
- **Guardianship:** By law, if an adult is unable to make a safe decision about his or her own welfare, a court can appoint someone else to make decisions for them. This person is known as a welfare guardian. Guardians can be partners, carers, relatives or social workers. **The court can also overrule a PoA and appoint a guardian if the PoA is abusing their trust.**

Key points

- Power of attorney is an **anticipatory measure**, granted by an adult who has the capacity to understand the significance of what it means to grant it. There is no question of a third party "applying" for power of attorney, in respect to someone who lacks, or has already lost capacity. It should not be confused with Guardianship
- **Guardianship orders are applied for to the court**, after the patient has lost or lacks capacity. For example, if someone was believed to be abusing their role as POA, the court could overrule them and appoint a guardianship order. Another example, in a pt with no POW, the court could appoint a guardianship order.
- Intervention orders are also applied for to the court. They are intended for one off, single, time limited decisions such as opening or closing a bank account, setting up a direct debit, or terminating a tenancy etc
- If someone is detained under the emergency MHA s36 they can only be treated without their consent if it is an emergency or another law is in place – e.g., AWI
- If someone is detained under the short term detention (s44) or CTO of the MHA they can be treated in accordance with the rules of the act (e.g. Tx of mental health disorder or physical complication of mental health disorder)