Implementing treatment

Biomedical Treatments for Major Depressive Disorder
The IB Syllabus Says:

• Examine biomedical, individual and group approaches to treatment.

• Evaluate the use of biomedical, individual and group approaches to the treatment of one disorder.

• Discuss the use of eclectic approaches to treatment.

• Discuss the relationship between etiology and therapeutic approach in relation to one disorder.
Biomedical Approaches to the treatment of depression

• The biological approach to the treatment of depression is based on the assumption that the problem is based on **biological malfunctioning**, and that drugs should be used to restore the biological system – this shows a clear connection between the etiology and the treatment.

• Since depression is known to involve imbalance in neurotransmission, drugs are used to restore and appropriate chemical balance in the brain, although it is not well known why not all patients respond the same way to a drug.

• In severe cases, **ECT** and **Psychosurgery** are also used
Biomedical Approaches to the treatment of depression

• Drugs were first used to treat psychological disorders in the 19th century. Since the 1950s their use has become widespread, and psychoactive drugs account for a large proportion of prescriptions.

• The drugs work by affecting neurotransmission of monoamines in the nervous system.

• The basic outcome of drug treatments is to increase the availability of neurotransmitters at the synaptic gap.
The Synapse

• The gap between neurons is called the synapse

• At the end of each axon there a synaptic button - neuronal impulses must cross the synaptic gap to travel to the next neuron

• This transfer is made by chemicals called neurotransmitters, released when synaptic vesicles release when the neural impulse reaches the terminals

• Each neurotransmitter has its own specific receptor cite – just like a key that fits a lock
The Synapse

**Figure 2–4**

**Synaptic transmission—communication between neurons.**

When a neural impulse reaches the end of an axon, tiny oval sacs, called synaptic vesicles, at the end of most axons release varying amounts of chemical substances called neurotransmitters. These substances travel across the synaptic space and affect the next neuron.
The effect of serotonin on human behavior

- Serotonin is a neurotransmitter and it has several functions in humans:
  1. the regulation of intestinal movements,
  2. the regulation of mood, appetite, sleep, muscle contraction,
  3. cognitive functions including memory and learning.
The effect of serotonin on human behavior

- Research with non-human animals suggests serotonin appears to have a role in social behavior:

- Kravitz (1988) injected lobsters with serotonin and found that they behaved like a dominant animal

- With humans, a great deal of research has been done on the connection between serotonin and depression
The Monoamine hypothesis

- The **monoamine hypothesis** proposes that low levels of the neurotransmitters *serotonin, norepinephrine* and *dopamine* in the synaptic gap between neurons in the brain, are associated with depression (Barlow, 1995)

- Because of this, psychoactive drugs have been developed to increase the effect peoples behavior by increasing amount of these monoamines at the synapse, the most popular type is called SSRIs, and there are also MAOIs (monoamine Oxidize inhibitors) and TCAs (tricyclics)
Selective Serotonin Re-uptake Inhibitors (SSRIs)

- SSRIs such inhibit the re-uptake of serotonin at the synapse and thus make more of the neurotransmitter available at the synapse.

- The most common SSRI is known *Fluxotine* by its brand name, *Prozac*. It is now one of the most widely used anti-depressive drugs (Costello et al. 1995)
Evaluation: Selective Serotonin Re-uptake Inhibitors (SSRIs)

- **Symptom Reduction:** SSRIs are effective in reducing symptoms of Major Depressive Disorder. In a clinical trial Prien et al. (1988) found them to be effective 65% to 75% of cases, compared to 33% for placebos. Burnstein et al. (1994) found that SSRIs significantly helped 60-80% of people.

- **Safe & Effective:** SSRIs are relatively safe, and very effective in reducing the symptoms of Major Depressive Disorder with adults.

- **Long Term Control & Suicide Prevention:** Most psychiatrists agree that modern drugs provide effective long term control for mood disorders and may prevent suicide in depressed patients.

- **Reducing Inpatient Admissions:** Drugs have been extremely effective in reducing the number of inpatients who are treated for psychological disorders, but it is important to note that such reductions may also reflect changes in policies towards hospitalization.
**Evaluation: Strengths**

**Evaluation: Selective Serotonin Re-uptake Inhibitors (SSRIs)**

- **The dodo verdict: SSRI’s are just as effective as other therapies?**

  **Aim:** Elkin et al. (1989) carried out one of the best controlled outcome studies, conducted by the National Institute of Mental Health (NIMH) in the US to examine the effectiveness of drug treatments in comparison to other types of therapy.

  **Procedures:** This study included 28 clinicians who worked with 280 individuals who were diagnosed with major depression. The individuals were randomly assigned to a treatment using either:

    1) an antidepressant drug (imipramine)
    2) interpersonal therapy (IPT)
    3) cognitive behavioural therapy (CBT)
    4) another form of therapy.
    5) a control group took a placebo pill, together with weekly therapy sessions.

  The assignment of patients to the placebo and drug group was carried using a double blind design, so that neither the patients or the doctors know which was which. All patients were assessed from the start, after 16 weeks of treatment and after 18 months.

  **Findings & Conclusions:** The results showed that just over 50% of the patients recovered in the CBT, IPT and drug treatment group. Only 29% recovered in the placebo group. The drug treatment produced faster results, but the NIMH study shows that there is no difference in the effectiveness of CBT, IPT and drug treatment. In other words, the study showed that it does not matter which treatment the patients received, as all the treatments had the same result.
Evaluation: Selective Serotonin Re-uptake Inhibitors (SSRIs)

- **Side effects:** Drug treatments have side effects such as vomiting, nausea, insomnia, sexual dysfunction and headaches. The side effects observed represent a major drawback and raise important ethical issues, and the costs and benefits of drug treatments must be considered.

- **Over Prescription & dependency?:** Lacasse and Lee (2005) are very critical towards what they call the ‘over prescription of SSRI’s such as Prozac, and many people become dependent on the medications for their everyday functioning.

- **The Wonder Drug?:** Prozac (an SSRI) was hailed the ‘wonder drug’ when it was first introduced in the late 1980s and it is currently the most frequently prescribed of all anti depressants. However, it has recently become a media target because of many anecdotal reports of serious side effects, including a preoccupation with violence and suicide in users (Steiner, 1991)
Evaluation: Selective Serotonin Re-uptake Inhibitors (SSRIs)

- **The dodo verdict: Effective Treatment?:** In another study Kirsch et al. (2008) reviewed 47 clinical trials published by the US Drug Administration on effectiveness of antidepressants. On the basis of their review they claimed that drug treatments were no more effective than placebos. According to Kirsch, antidepressant medication should generally only be prescribed to the most depressed patients or if alternative methods have failed. The review showed that depressed patients can improve without biochemical treatment.

- **Drugs or Exercise?:** Blumenthal et al. (1999) found that exercise was just as effective as SSRIs for an elderly group of patients.

- **Reducing Symptoms But Not a Cure:** Another criticism is that drug treatments are effective in reducing symptoms but do not constitute a cure for mental disorders.
Evaluation: Selective Serotonin Re-uptake Inhibitors (SSRIs)

• Drugs no Better than a Placebo?:

Aims: Leucher & Whitte (2002) aimed to examine the effectiveness of SSRI’s in comparison to placebos, and examine the brain structures activated.

Procedures: They used a double blind design to assign patients to the placebo and control group, and they monitored brain activity patients with EEGs after the treatment.

Findings: 1) They found that depressive patients receiving drug treatments improved just as well as patients receiving a placebo. 2) They found that changes in brain functioning in both groups but the changes were different. Patients who got the placebo showed increased activity in the prefrontal cortex and those who took the antidepressants showed decreased activity in that area. The researchers observed that the changes took place within the first 48 hours of taking drug treatments, whereas changes began after two weeks for the placebo group.

Conclusions: It is not known why the placebo works but the results of the study clearly showed that the placebo worked and was better than no treatment. The researchers argue that the brain does not respond in the same way to placebos and drugs but peoples mental health improved in both groups. This indicates that although medication is effective, there may be other ways to help people who suffer from depression.
Evaluation: Selective Serotonin Re-uptake Inhibitors (SSRIs)

- **Ethical Issues**: Unless treatment is regarded as an emergency it cannot be given without a patient's consent, except where the patient may not be capable of giving consent. This consent should be given on the basis of full information about the potential benefits and drawbacks of the drugs concerned, in which case it fulfils the ethical criterion of informed consent.

- **The Economics of The Pharmaceutical Industry**: There is an enormous market for antidepressant drugs. For example, in the UK 291 million pounds (120 million on SSRIs) is spent annually on antidepressants. SSRIs account for 16 million prescriptions a year according to an article from The Times Newspaper (February 26, 2008).
The use and mode of action of Electroconvulsive Therapy (ECT)

- This controversial treatment developed from the mistaken idea the inducing epileptic seizures would reduce symptoms of schizophrenia

- Initially seizures were induced by giving patients insulin. But it was extremely difficult to judge the correct dosage

- Cerletti and Bini (1938) first tested the technique of applying electric shocks to the brain in order to induce seizures. In a few decades, ECT was very popular and used to treat a wide variety of psychiatric disorders

- But there were side effects such as severe memory loss, speech disorders and irreversible brain damage. Its use declined with the development of psychoactive drugs in the 1950s.

- The decline was also partly due the fact that ECT was seen as barbaric and punitive treatment that caused serious side effects.

- However, it soon became clear that the new drugs did not offer a complete solution and interest revived in ECT

**How ECT works**

Used to treat **Severe Cases of Major Depression**
How ECT works

• Modern techniques are more humane, and patients are given muscle relaxants and short acting anesthetics before the ECT begins.

• **The ECT procedure** - The standard procedure involves administering a current of between **70 and 130 volts** for between half a second to five seconds. This usually induces convulsions for a brief period and then the patient comes round from the anesthetic with no recollection of the treatment. Usually a course of *approximately six sessions* will be given over a period of a few weeks.

• ECT is ineffective in reducing psychotic symptoms of schizophrenia, but has been found to be **very effective** in alleviating **Severe Major Depression** in some people (particularly the elderly).

• It works much more *rapidly* than antidepressant drugs so it is often the treatment of choice for patients who are severely depressed and at the risk of suicide ([http://www.youtube.com/watch?v=y8K37POBojs&feature=related](http://www.youtube.com/watch?v=y8K37POBojs&feature=related)) ([http://www.youtube.com/watch?v=1JG9eQsjaZY&feature=related](http://www.youtube.com/watch?v=1JG9eQsjaZY&feature=related)).

• Despite its effectiveness, the precise mechanism underlying its therapeutic action is not understood. It seems likely that ECT increases the availability of the monomamine **nor-adrenaline**, but it is such an invasive technique it is difficult to isolate the element that brings about therapeutic change.
Evaluation: The use of ECT

- **A controversial treatment** – ECT is controversial, not only because the medical profession is still unsure of how it works, an analogy has been made with ‘banging the side of the television to make it work’ (Heather, 1976)

- **Effective in treating severe depression** – ECT has been very successful in treating severe depression where all other methods have failed, and many argue that this is sufficient justification for its use, especially if it prevents suicide. It is also a quick form of treatment, in contrast to drugs or psychological therapies. Klerman (1988) believes that ECT is the optimal treatment for severe depression

- **Success rate treating depression** – Sachheim et al. (1994) found that 60% to 70% of patients improve after treatment, but relapse rates are also high
Evaluation: The use of ECT

- **After all other treatments have failed** – ECT should only be administered if anti-depressant drugs have no effect and if there is a risk that the person will commit suicide.

- **Side effects** – when ECT was first introduced there were dangerous side effects e.g. bone fractures, memory loss, confusion. There are no detectable changes in brain structure with the newer procedure, and the technique is being continually improved and side effects are being reduced.

- **Nature of the treatment** – Although the technique is improved, the decline in the use of ECT continues. Comer (1995) argues that applying an electrical current to the brain is a frightening and forceful intervention. Many clinicians argue that effective antidepressants provide a much more attractive alternative.

- **Consent and control** – nowadays ECT requires the consent from the patient or a close relative. However, ECT has a history of abuse, being used as a means of punishing and controlling people in mental hospitals. Some people have received hundreds of ECT treatments.
How psychosurgery works

This has been used to treat schizophrenia and severe major depression

The use and mode of action of Psychosurgery

• Psychosurgery is an extremely invasive technique as it involves the destruction or removal of neural tissue from the brain

• The first psychosurgery technique was the ‘pre-frontal lobotomy’ developed in the 1930s by Moniz a Portuguese neurologist as a cure for schizophrenia

• This is a fairly drastic surgical procedure involving the destruction of the fibers connecting the frontal cortex with the lower centers of the brain

• Moniz claimed high rates of success and it was take up enthusiastically by surgeons around the world. It is estimated that 40,000 to 50,000 operations were carried out in the US in from the late 1930s to the early 1950s –Walter Freeman was a doctor who conducted many of these (see video http://www.youtube.com/watch?v=_0aNILW6ILk)

• Despite Moniz’s claims, there was no evidence that the lobotomy provided an effective form of treatment. Many patients did indeed calm down and could be discharged from hospitals, but the re-admission rates were high and significant detrimental effects were found such as withdrawal, stupors, seizures, and even death

• With the introduction of psychoactive drugs in the 1950s, the lobotomy was largely abandoned – but more recently interest in psychosurgery has grown again, with the use of the of a less invasive technique called a ‘cingulotomy’ which involves the severing of the cingulate gyrus connecting the frontal cortex with the lower parts of the brain http://www.makingthemodernworld.org.uk/learning_modules/psychology/02.TU.04/?section=8
Evaluation of psychosurgery

Evaluation: The use of psychosurgery

- **A last resort** – psychosurgery continues to be regarded as the most controversial treatments for all mental disorders. The modern procedures are less invasive though there are still dangers and this kind of treatment should only be offered in a last resort.

- **Effective for extreme cases** - However, Beck and Cowley (1990) state that the procedure can be beneficial in some cases of extreme anxiety and depression.

- **A controversial treatment** – Psychosurgery has come under attack more than any other treatment for mental disorders, Comer (1995) explains that it was performed on tens of thousands of people in the 1950s as a response to overcrowding in mental institutions in the US. There are also concerns that it has been used to control perpetrators of violent crimes.

- The lobotomy also became a civil rights issue with claims that it was being used as a means of silencing political activists and the controlling of difficult patients in mental institutions.

- **Informed consent** – certain people, including children, those with learning impairments and people with psychotic disorders may not be able to give informed consent for treatment. – this means that biological treatments have been administered without informed consent. This is particularly true for someone who has been Sectioned under the Mental Health Act (in the UK). However, UK law now requires the patients consent as well as the opinion of an independent doctor before psychosurgery is used.