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Antidepressant Response Marker—Revolutionizing Depression Treatment

Hook: Imagine falling into a ditch. It's dark and lonely. All of a sudden the ditch crumbles on top of you. As much as you keep trying to climb out of this hole, more and more rocks pile on top of you. At the exact moment you want to give up, you see a crack of light show up at the top. All of a sudden a rope slides down. You finally think to yourself, this ordeal is over. You grab the rope, test to see if it's sturdy, then you start climbing up. With each step you feel closer and closer to the top. In an instant the rope snaps and you crash down all the way back to where you started bruised and beaten up.

Information: This ordeal is one that is faced by patients of Major Depressive Disorder who are struggling through relapse. As stated by the **DSM-4 of 2009**, the official coding system for mental disorders, depression is a mood disorder which encompasses low mood along with a feeling of helplessness. In order to treat depression, most patients have a combination of drug therapy along with talk therapy. Even though medications work for most people, relapse may occur.

A report published by the **University of Texas** Counseling and Mental Health Center, dated July 24, 2008, explains that relapse occurs because doctors are not able to diagnose whether a medication is working or not until 6-8 weeks after the start of treatment. Until recently there has been no real biological test to measure the effectiveness of the medication. In a report published by the **UCLA medical journal titled Vital Signs**, dated September 14, 2009, Dr. Ian Cook, Dr. Karl Burgoyne, and Dr. James McCracken have created a test called the Antidepressant Treatment Response marker or ATR.

Thesis: With this new test, treatment times for depression may be cut drastically and help millions of people avoid relapse.

Preview: Today we are going to discuss how the medication works and the effects of relapse. Next we will learn about the test itself and finally, we will learn about future implications.

First topic sentence: First, we will talk about how depression medication works and the effects of relapse.

First Sub point: An article by the **Harvard Medical Journal**, dated August 31, 2009, explains antidepressants try to increase serotonin and norepinephrine, which regulates the "feel good" center of the brain. For example when you work out, your body releases both serotonin and norepinephrine. These released chemicals are then absorbed into your brain which makes you feel happy and rejuvenated. On the other hand patients with depression are not able to absorb these two chemicals which can lead to a chemical deficiency. This deficiency causes feelings of sadness and hopelessness. Depression medication works to either help your brain create these two chemicals or absorb them.

Second Sub point: Now that we have seen how the medication works, let's talk about the effects of relapse. Treatment is mostly based on a trial and error basis. When a medication does not work, the patient has to restart treatment which can prolong the process. According to a report written by **Dr. Nancy Shy-mel-fine, dated August 20th 2008** a respected psychiatrist and depression patient herself, during this time a medication can work or not depending on your brain chemistry and what chemicals are lacking. If the medication doesn't either solve the issue a patient may be having or does not match the brain chemistry. The effects of relapse in turn can be very painful. In a personal interview with a **panel of depression patients**, I learned that relapse many times has the same side effects that a drug addict going through withdrawals faces. In turn, for patients already hopeless about life, relapse can become the last straw. Going through relapse is much like the story in the anecdote. Falling into depression is akin to falling into a ditch with rocks on top of you. In turn, medication is much like the rope falling in to pull you out of this ditch. When this rope does not work, it will snap. This is much like what happens when relapse occurs and the medication fails. In turn you fall back into the ditch worse off than before. While relapse is constantly occurring, doctors and many times shackled with the limitations of science. First, a doctor must wait 6-8 weeks after prescribing medication in order to see if relapse is occurring. After the 6-8 weeks have passed, the only way a therapist can tell if a medication is working by asking the patient questions such as "How are you feeling?" or "Are you going to hurt yourself?" In a personal interview with **Dr. Annie Lee**, a psychiatrist at Kaiser Milpitas, explained, "Finding a medication that works for a patient can be very frustrating. Without a real biological way to test if the medication is working, we are completely dependent on what the patient tells us, which sometimes they keep valuable information hidden because they are scared of the consequences."

Transition: Now that we have seen how depression medication works and the current state of drug therapy for depression patients, we will look at how the ATR will improve the treatment process for both the patient and the psychiatrist.

Second main point: The ATR or antidepressant treatment response index is a painless 15 minute test that uses quantitative electro-ense-falography (QEEG) in order to test brain wave patterns to see how the patient is responding to the medication.

First sub point: First let us look how the test actually works. According to a report published by **The UCLA School of Medicine** dated September 10, 2009, the study which is called Biomarkers for Rapid Identification of Treatment Effectiveness in Major Depression, or BRITE-MD took a total of 375 patients diagnosed with major depressive disorder. The patients were hooked up to 6 electrodes around their head and earlobes and their baseline QEEG's were recorded in order to see how their normal brain waves were without any medication. Then the patients were given a normal dosage popular depression medication. After one week the same patients were brought back to take another QEEG in order to see how their brain waves have changed. The researchers hope to see that if there are changes in waves, then they can see that the medication has a positive effect. If the brain waves have not changed, then the rate of relapse could be higher.

Second sub point: Now that we have seen how the test works, let us discuss the results. In the previously cited September 2009 edition of **Vital Signs**, the study produced a 74% success rate in

predicting whether the medication would work or not. However this success rate may be flawed. A report written by **Dr. John Grohol**, dated September 13, 2009, states the test worked mostly on 2 medications, Lexapro and Wellbutrin, while tests on the other medications were very inconsistent. In a person interview with one of the founders of the test, Dr. Ian Cook of UCLA, I learned that we can't make this assumption so early in the testing process. On top of this, the test's ability to predict an outcome in only a week with a 74% success rate for all medications makes it the most successful attempt to date for a fast and painless bio marker to treat depression. This outstanding success rate has caught the attention of the National Institutes of Mental Health who are now funding two more research projects on the ATR test.

Transition: Now we have looked at how this new test and the success rates of it so far, we will now talk about future implications of this new test.

Thesis: The two biggest implications coming from this new test is the ability to save lives and also save money for our heath care system.

First sub point: First let's start with saving lives. The annual report published but the **National Institute of Mental Health** dated January 23, 2009, states that suicide is the third leading cause of death. Out of all suicides, 65% of them are due to some type of major depressive disorder. With a biomarker for depression, treatment time for depression can be cut in half as the ability to match medication with a patient is made possible in sometimes an 8^{th} of the time. With a quicker chance of recovery, there will be less chances for the sometimes fatal effects of relapse.

Second sub point: Now let's talk about how this new test can save money. Along with the possibility of a faster and more effective treatment, this new test has the ability to lower the rate of lost productivity and health care costs in our country today. **Psychology Today** dated July 24, 2009, explains that depression has cost companies in access of 1.4 billion dollars a year in lost productivity. Along with a loss in productivity, treatment for depression patients in the hospital has tripled in the past year.

According to **Kaiser Hospital** in Fremont, California, a week in the hospital for treatment of depression patients can cost over 15,000 dollars. And just an ambulance ride alone can cost around 1,000 dollars. Usually insurances companies pay the cost of treatment in full but there are patients who do not have health insurance and at that time, the cost is usually passed on to the taxpayers.

Restate: Today we talked about the ATR which can help stop relapse and speed up the treatment of depression. First, we looked at how depression is treated today and how the process of drug therapy works. Then, I talked about the ATR test and how it can revolutionize the treatment of millions of patients suffering from major depressive disorder and finally, I talked about future implications.

Tie back to hook: As we go back into the dark and lonely ditch, you are sitting there bruised and frustrated from failing once. Now with this test, there is new hope that a new and stronger rope can come down and finally pull you out so you can get back to your life.