

**NEUROTRANSMITTERS AND RECEPTORS**

*Part 2 of 5*

Pain has been treated for centuries by a wide variety of drugs, but only in recent years has medical science discovered how pain is relieved by a drug. Relief occurs when a drug activates or triggers action sites in the brain and spinal cord (CNS) called receptors. They are called receptors because they “receive” a triggering chemical called a neurotransmitter, or an externally taken drug (analogue, or substitute) that replaces the naturally made neurotransmitter.

**KEY MESSAGE FOR INTRACTABLE PAIN SYNDROME (IPS) PATIENTS**

Persons with IPS (constant pain with cardiovascular and endocrine sequelae) must activate at least 2 of 7 specific receptors daily in order to relieve pain. The most dominant receptor for pain relief is the endorphin receptor, and the second most critical is called the gamma aminobutyric acid (GABA) receptor. All IPS patients will recognize the critical importance of these two receptors since they find relief with an endorphin substitute such as the opioids hydrocodone or oxycodone, or a GABA substitute such as gabapentin, pregabalin (Lyrica®), diazepam (Valium®), or carisoprodol (Soma®).

**CHALLENGE FOR IPS PATIENTS**

Unfortunately, a person with IPS may have considerable receptor damage from severe pain and/or a genetic defect in their receptors which impairs normal function. Either of these two scenarios may require higher than usual dosages of a drug, and/or drugs that activate the secondary receptors.

IPS patients who cannot obtain enough opioids or benzodiazepines will have to find pain relief and comfort by either, or both, of the following measures:

1. Enhance the effectiveness of the two major receptors
2. Activate one or more of the secondary receptors

**THE PAIN-RELIEF RECEPTORS AND SOME ACTIVATING DRUGS**

Receptors are a round shaped protein matrix comprised of amino acids

**MAJOR:**



**Endorphin**

opioids, oxytocin  
naltrexone, kratom



**GABA**

gabapentin, Lyrica®  
Soma®, Valium®, Xanax®

**SECONDARY:**



**Dopamine/Noradrenaline**

Adderall®, phentermine  
methylphenidate,  
dextroamphetamine



**Serotonin**

Zoloft®, Cymbalta®  
nortriptyline  
amitriptyline



**Cannabinoid**

CBD  
marijuana



**N-Methyl-d-Aspartate (NMDA)**

ketamine  
dextromethorphan



**Adrenergic**

clonidine  
tizanidine

**TREATMENT OF UNDERLYING DISEASE INCLUDING INFLAMMATION**

The activation and triggering of receptors is only symptomatic pain relief and not a curative or healing measure. Symptomatic relief, however, does provide the ability to ambulate, rationalize, and participate in curative treatment measures. These include the suppression of inflammation, regeneration of damaged tissues, and physical measures.

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